



Emerald Gazette

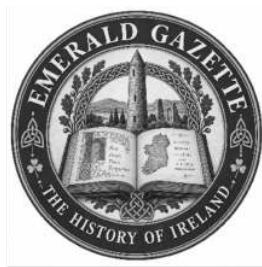


Ice Age

32000–31901 BCE

Issue 001 of 340

Compiled & Edited by Gerard J. Hannan BA MBS MA



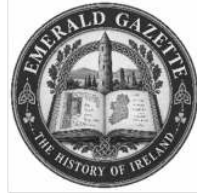
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Introduction

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.

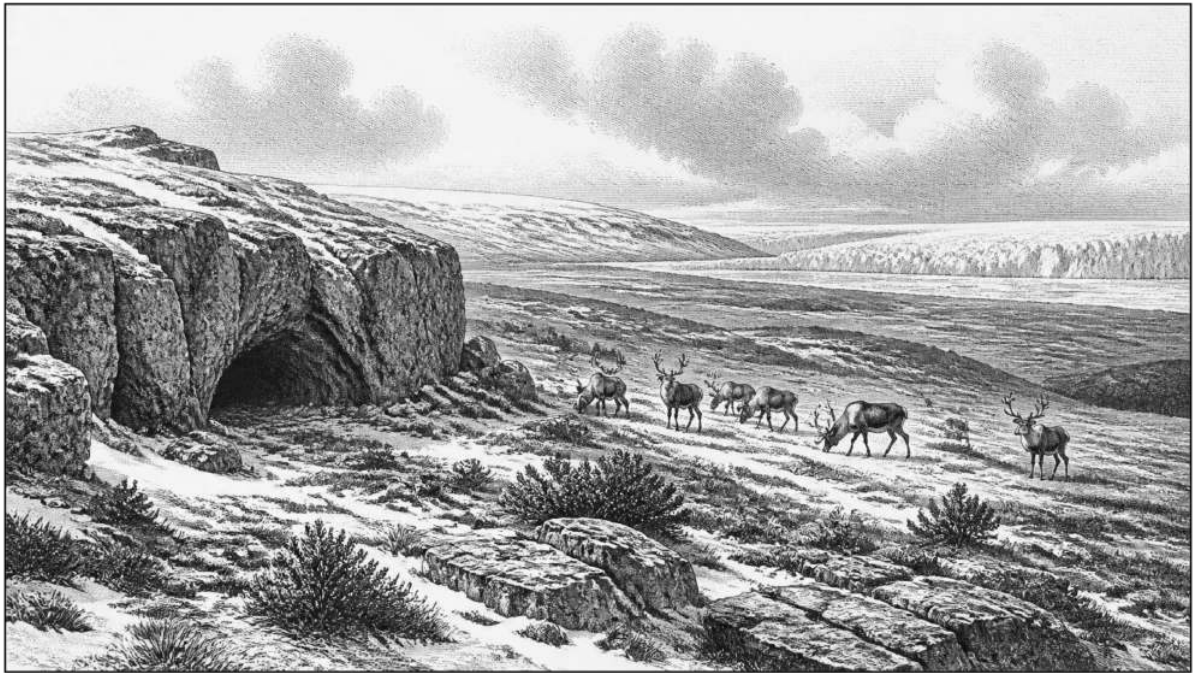
Every issue should therefore be understood both as an individual publication and as another chapter in a much larger project. Read separately, each volume offers a portrait of a particular historical period. Read together, the complete collection becomes an extended chronological journey through the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

32000 BCE

Castlepook Cave Fauna^[1]



32,000 BCE is a modern chronological label, not a date that can be matched to an Irish historical year. There are no written records, named individuals, excavated settlements or securely dated events from this point. Indeed, the precision implied by a calendar year is unavailable: radiocarbon results are expressed as ranges and must be calibrated, while geological and archaeological sequences are often resolved only to centuries or millennia. In broad terms, 32,000 BCE falls about 34,000 years before the conventional “present” of 1950, within the Late Pleistocene and the Upper Palaeolithic of north-west Europe.

For Ireland, this is an age of fragmentary environmental evidence and exceptionally tentative traces of human activity. It belongs to the long lead-in to the Last Glacial Maximum, when the British–Irish Ice Sheet reached its greatest known extent, broadly around 27,000–23,000 years ago. The important story for this date is therefore not a kingdom, battle or migration that can be placed in a single year, but an unstable Ice Age landscape: probably still offering ice-free habitats in places, increasingly shaped by colder climate and expanding ice, and inhabited—if humans came at all—only fleetingly.

An Ireland Before Maximum Glaciation

The island’s familiar outline is misleading for this remote period. Sea level was much lower than today because immense volumes of water were locked in global ice sheets, exposing wider continental shelves around Ireland. Yet lower sea level did not automatically create a walkable land bridge from Ireland to Britain or continental Europe. Research on the Irish Sea has long stressed that any late-glacial connection was, at best, limited, temporary and geographically complex; it should not be assumed for 32,000 BCE. Water, sea ice, rugged coasts and changing glaciers were barriers as well as possible routes.

Nor was Ireland simply a white, static ice-cap. The last British–Irish Ice Sheet grew and altered through time. Large-scale reconstructions place its maximum extent later than this article’s focal date, while evidence from land and sea shows that ice margins advanced, merged and retreated in different sectors at different times. Thus it is responsible to say that 32,000 BCE lay in a severe glacial phase before the full Last Glacial Maximum, but not to draw a firm coastline or ice margin for one exact year. Regional conditions could have differed markedly between the Atlantic west, the southern lowlands, upland areas and the Irish Sea basin.

By the maximum, ice had overridden much or all of the island and extended far beyond modern coasts onto the Atlantic and Celtic Sea shelves. Its movement eroded older surfaces and redistributed sediments. That later destruction matters greatly: even if people had visited Ireland before the maximum, campsites on exposed ground would have been vulnerable to removal or burial. The absence of a site is therefore not uncomplicated proof that no person ever arrived. But neither does it justify turning a possibility into a settled population.

Cold Landscapes and Ice Age Animals

Environmental evidence comes chiefly from cave deposits, bones, sediments, landforms and the wider north-west European climatic record. Ireland’s limestone caves are particularly important because they can preserve animal remains where open-air sites have not survived. Late Pleistocene Irish faunas include species associated with cold or open environments: reindeer, woolly mammoth, giant deer (*Megaloceros giganteus*), brown bear, wolf, Arctic fox, hare and lemmings; spotted hyaena is also known from southern Irish cave material. These animals did not all necessarily live together at every place or moment. Cave collections frequently combine finds accumulated over long periods, and modern redating has shown how necessary it is to reassess old identifications and assumed associations.

For the broad interval surrounding 32,000 BCE, the most defensible picture is of an open, cold landscape, not the dense green woodland of later prehistoric Ireland. Grassland, herb-rich steppe-tundra, low shrubs and exposed ground would have supported grazing and browsing animals, while conditions varied with season, elevation and proximity to ice. Caves were not necessarily homes. They might receive bones brought in by carnivores, animals dying naturally, water action, roof-fall, or human visitors. A bone in a cave proves that an animal was present or transported there; it does not by itself reconstruct a living community outside.

Castlepook Cave near Doneraile, County Cork, is central to this deep history. Its early excavations produced an extensive collection of Pleistocene animal remains, including material which later research has reassessed through radiocarbon dating. Castlepook and other Cork caves demonstrate that Ireland possessed habitats capable of supporting substantial Ice Age fauna before the ice sheet’s maximum advance. They illuminate an Irish environment connected ecologically to wider north-west Europe, even though the precise routes by which animals entered, and the duration of their local populations, remain subjects of research.

The Human Question

There is no securely excavated dwelling, hearth, tool assemblage, grave or human skeleton that permits historians to describe an Irish society in 32,000 BCE. There is consequently no evidence for political organisation, diplomacy, warfare, religion, formal learning, trade networks or permanent

settlement on the island at this date. Terms such as “tribe”, “chief”, “Irish people” or “nation” would impose much later ideas on a record that cannot support them.

The question is nevertheless not entirely empty. A reindeer femur from Castlepook Cave has been publicised as approximately 33,000 years old and as carrying marks consistent with stone-tool butchery. If those markings are confirmed as human-made, and if their relationship to the dated bone is securely demonstrated, the find would indicate human handling of an animal in Ireland during the pre-maximum part of the last glacial cycle. It would be immensely important—but it would still represent an episode, not proof of a resident population, a named culture or activity in the exact modern year 32,000 BCE.

Caution is essential because the bone derives from an old cave collection rather than a modern, fully documented excavation context. Natural damage can resemble deliberate modification; collections excavated in the nineteenth and early twentieth centuries may have lost the sedimentary relationships that allow archaeologists to connect an object confidently with a particular occupation surface. The responsible formulation is therefore that Castlepook offers *possible* evidence of very early human activity in Ireland, not an established narrative of continuous Palaeolithic settlement.

The clearest published direct evidence for Palaeolithic people in Ireland remains much later. At Alice and Gwendoline Cave in County Clare, a brown-bear kneecap bearing cut marks was directly dated to roughly 12,810–12,590 calibrated years before present, or about 10,860–10,640 BCE. Subsequent work has confirmed that bear, reindeer and giant deer were present in the relevant terminal-Pleistocene setting. This provides strong evidence that people processed an animal in Ireland late in the Ice Age. It does not bridge the vast intervening span back to 32,000 BCE.

Life Elsewhere, Not Yet an Irish Society

Across Europe, Upper Palaeolithic hunter-gatherers made sophisticated stone, bone and antler tools, pursued varied subsistence strategies and in some regions produced striking portable and cave art. Such evidence establishes what human communities elsewhere were capable of; it cannot be transferred wholesale to Ireland. No Irish object securely attributable to 32,000 BCE demonstrates a particular tool tradition, language, ritual practice, artistic convention or social structure. Any people reaching the island may have travelled as small mobile groups whose material traces were slight even before glacial erosion took its toll.

If a Castlepook bone was butchered by people, the most modest inference is economic: visitors acquired or processed meat, marrow, hide or other useful animal materials. Reindeer would have been a valuable resource, but a single modified bone cannot tell us whether it was hunted, scavenged, carried from elsewhere, or processed beside the cave. It gives no basis for estimating population size, season of occupation, exchange, property or gendered divisions of labour. Archaeology often advances through such disciplined limits: an interpretation becomes stronger only when several independent lines of evidence agree.

Regional Change and a Broken Record

Ireland’s later glaciation is both the subject of this period and an obstacle to understanding it. Glacial scouring, meltwater, slope processes, peat growth, rising seas and modern development have altered or concealed ancient landscapes. Former coastal plains are now submerged. In contrast, caves may preserve bones but can mix deposits, while acidic soils commonly destroy organic remains. The archaeological map of Ice Age Ireland is therefore uneven by nature, not merely unfinished.

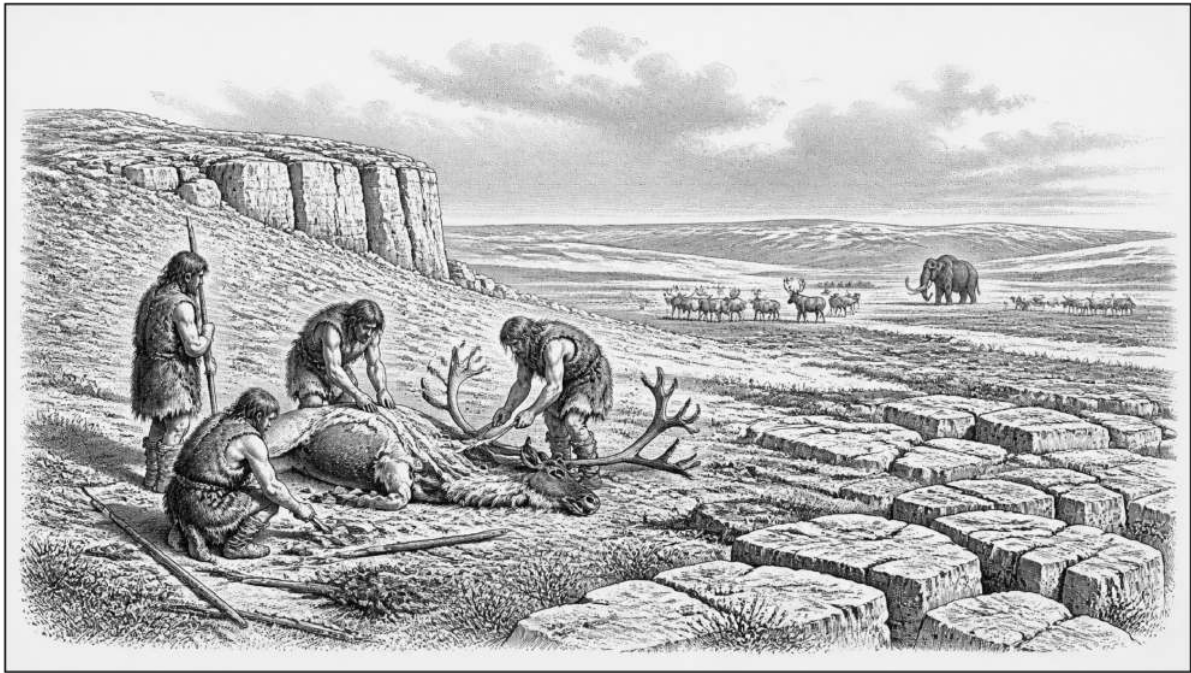
That unevenness explains why this year is best understood as a threshold rather than a beginning. Around 32,000 BCE, Ireland was part of the climatic and ecological world of Upper Palaeolithic Europe, but its human status remains uncertain. In the following millennia, worsening conditions and the expanding British–Irish Ice Sheet transformed the land, extinguishing or displacing animal populations and making enduring occupation improbable. Only after deglaciation, much later, do archaeological traces become sufficient to tell a fuller story of people returning, settling and reshaping the island.

For now, the most honest history of Ireland in 32,000 BCE is one of Ice Age possibility bounded by evidence: cold open country, large mammals, advancing ice, altered coastlines and perhaps brief human encounters whose traces are rare, fragile and still under investigation.

Chapter 002 of 100

31999 BCE

Cut-Marked Reindeer Bone^[2]



The label 31,999 BCE should not be mistaken for a date that people in Ice Age Ireland could have recognised, or that archaeology can isolate to a single year. This was long before writing, named rulers, states or calendars on the island. It falls broadly within the Late Pleistocene, in Marine Isotope Stage 3, a climatically unstable part of the last Ice Age. The most responsible approach is therefore to describe a span around this notional year using calibrated and radiocarbon date ranges, rather than inventing an event for it. In Irish terms, the period is important precisely because it may preserve the earliest presently claimed trace of human activity, while leaving enormous questions unresolved.

A Date Range, Not a Dated Event

The nearest relevant evidence comes from Castlepook Cave near Doneraile in north County Cork. A reindeer femur from the cave has been described by its researcher, Ruth Carden, and by County Cork heritage publications as bearing a cut mark made when the animal was butchered with a sharp stone tool. The publication places the object at about 31,000 BC. That makes Castlepook unusually pertinent to 31,999 BCE, but it does not licence precision beyond the evidence. A bone's scientific date is an estimate with an uncertainty range; converting between radiocarbon years, calibrated calendar years and BCE notation introduces further caution. Nor can one cut-marked bone date a particular hunt, season or year.

The find is potentially transformative, but its limits matter as much as its promise. No securely associated stone tool, hearth, dwelling floor, human skeleton, burial or extensive food debris of this age has yet been recovered in Ireland. The femur was found in a cave whose deposits were investigated in the early twentieth century and whose bones were moved, accumulated and disturbed by natural processes over very long periods. The best reading is not that a settled population occupied Ireland in 31,999 BCE,

but that a hunter or hunters may have processed a reindeer on the island, perhaps during a brief visit, within a broad period around the early thirties of millennia BCE. Further excavation of undisturbed deposits is needed to test that interpretation.

Ireland in Marine Isotope Stage 3

Around this approximate date Ireland had not yet entered the fullest phase of the Last Glacial Maximum. The peak expansion of the British–Irish Ice Sheet came later, conventionally placed around 26,000–19,000 calibrated years before present, although its timing and extent varied by region and remain actively researched. Evidence from landforms, marine sediments, sea-level records and exposure dating indicates major growth and later retreat of ice over the island. By the glacial maximum, much or perhaps nearly all of Ireland was covered by ice; any earlier traces on the open landscape were vulnerable to erosion, burial and destruction.

At roughly 32,000 BCE, however, the country should not simply be imagined as an unbroken white ice cap. Castlepook’s mammal assemblage indicates that at least parts of southern Ireland supported terrestrial animal life during the preceding, milder or less glaciated phases of the Ice Age. Conditions would still have been much colder, more seasonal and more changeable than today. The precise pattern of vegetation cannot be reconstructed for every Irish valley, but open grass-and-herb communities, patches of low shrubs and exposed ground are more plausible than the familiar wooded landscape of later millennia. Forests of oak, ash and hazel belonged to a much warmer future.

Sea level was lower globally because water was locked in continental ice sheets. Yet low sea level did not automatically create a simple, permanent dry land bridge between Ireland and Britain. The Irish Sea basin, the shape of the coasts, local ice masses and changing relative sea level all complicate the picture. Large mammals and, if the Castlepook interpretation is correct, people nevertheless reached Ireland. Their routes may have involved exposed coastal plains, narrower water crossings, seasonal ice conditions or combinations of these. The evidence does not yet decide which route applied at the time of the cut-marked reindeer bone.

The Cave’s Animal World

Castlepook Cave is Ireland’s richest known archive for the vertebrate fauna leading up to the Last Glacial Maximum. More than two thousand bones have been recovered there, from deposits representing long and varied periods rather than one single living community. Direct dates from the wider assemblage stretch broadly from about 45,700 to 19,950 radiocarbon years before present, while modern redating has shown that some older determinations required substantial revision. Consequently, animals listed from the cave cannot all be placed together in 31,999 BCE. They do, however, establish the kinds of Ice Age fauna that reached Ireland during the long interval surrounding it.

The assemblage includes reindeer, woolly mammoth, giant deer or ‘Irish elk’, brown bear, wolf, Arctic fox, mountain hare, collared lemming and Norwegian lemming. Most striking is the spotted hyaena, known in Ireland chiefly from Castlepook. Gnawed and broken remains demonstrate why a cave deposit cannot automatically be treated as a human food store: carnivores carried carcass parts into caves, fed there and left bones exposed to later movement by water, sediment and excavation. A mammoth or reindeer bone in the cave proves the animal was present in the wider landscape; it does not by itself prove that people killed it or entered the cave.

This faunal evidence suggests a productive, if demanding, cold-climate landscape rather than an empty wilderness. Herd animals could have exploited grazing and herb-rich ground, while predators and scavengers followed them. Reindeer were especially mobile animals, and their seasonal movements offer a credible reason why human groups might have ranged into Ireland. But a credible scenario remains an interpretation. Archaeology cannot presently identify where a reindeer was killed, whether hunters travelled in a family group or a small task party, how long they stayed, or whether they returned.

People: A Fleeting Possibility

If the Castlepook cut mark is accepted as anthropogenic, it records a very small human footprint: the use of a sharp lithic edge on fresh bone. It supports hunting or carcass processing, not a named culture, a permanent colony or a continuous ancestry leading to later Irish communities. The people involved cannot be assigned securely to an ethnic label, a language or even a particular archaeological tradition from this evidence alone. Modern humans had spread across parts of western Europe in the Upper Palaeolithic, and Gravettian-associated communities were present on the continent during broadly comparable millennia. Yet there is no Irish tool assemblage of this date from which to call the Castlepook visitors Gravettian, and no basis for calling them Gaelic, Celtic or Irish in any later cultural sense.

Everyday life, if people were present, would have depended on portable knowledge rather than permanent monuments: finding fuel and shelter, maintaining cutting tools, reading animal movements and coping with fast-changing weather. Meat, marrow, hide, sinew and bone were valuable products of a large animal, but the Castlepook evidence does not reveal which were taken. There is no reliable evidence for houses, clothing styles, art, musical instruments, formal graves or ceremonial places in Ireland at this date. Such practices existed in various forms among Upper Palaeolithic populations elsewhere in Europe, but transferring them wholesale to Ireland would turn analogy into fact.

No Politics, No Diplomacy

There were no Irish kingdoms, chiefs recorded by name, borders, treaties, taxation systems or diplomatic institutions that can be responsibly placed in 31,999 BCE. Conflict is equally beyond direct observation. Hunting large animals could have involved cooperation, and human groups elsewhere sometimes competed for territory and resources, but neither warfare nor alliance is visible in the Irish record. The only defensible ‘regional politics’ is physical geography: Ireland stood at the north-western edge of the European world, its accessibility repeatedly reshaped by climate, ice and sea.

There is likewise no evidence for farming, herding, metalworking, market exchange or organised long-distance trade within Ireland. Any visitors would have been hunter-gatherers using stone technology. They may have carried useful materials and social connections from places beyond the island, but no imported object of this age has been identified here. The economic story is thus one of subsistence opportunity and mobility, not trade routes or production centres.

What the Evidence Can Say

The deepest significance of this approximate year lies in the distinction between discovery and certainty. The Castlepook reindeer femur offers a plausible and officially recognised indication that people reached Ireland around 31,000 BC, far earlier than the island’s once conventional archaeological starting point in the Mesolithic. Later, better-established evidence includes a butchered brown-bear bone from

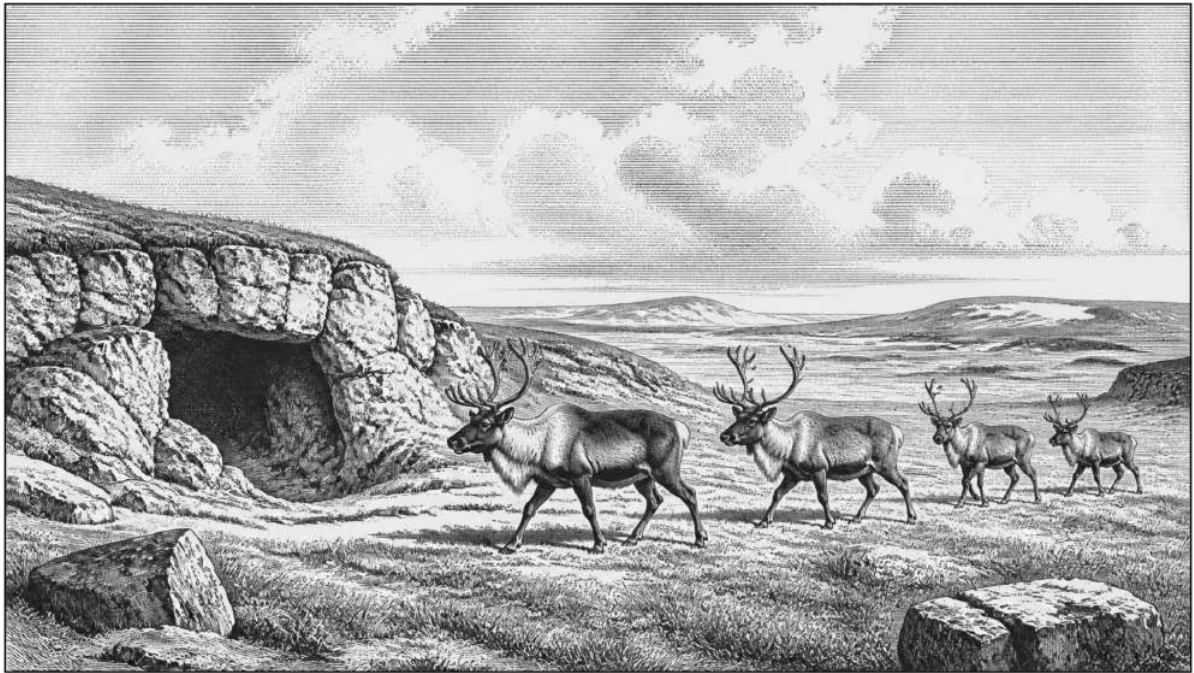
Alice and Gwendoline Cave in County Clare, independently dated to about 12,810–12,590 calibrated years before present. That later find is stronger because it was directly dated by two laboratories, but it does not answer the question of earlier visits.

Glaciation then intervened. The later ice sheet remodelled much of the country and could have removed or concealed camps, tracks and coastal sites from earlier millennia. This helps explain why Ireland's Palaeolithic record is so slight, but it cannot be used to fill the gaps with imaginary settlements. Around 31,999 BCE, Ireland was a changing Ice Age landscape inhabited by notable mammals and perhaps visited by small groups of human hunters. Its history survives not in chronicles or monuments, but in one cautiously interpreted cut mark, dated bones, cave sediments and the scars left by ice. That is a slender record, yet it is enough to make this remote threshold one of the most intriguing problems in Irish prehistory.

Chapter 003 of 100

31998 BCE

Castlepook Reindeer Marks^[3]



31,998 BCE is not a date that can be matched to a recorded Irish event. It is a modern calendar label applied to a time deep in the Late Pleistocene, long before writing, states, named peoples or even securely documented settlement on the island. Calendar-year precision is therefore unavailable. Indeed, 31,998 BCE is approximately 33,947 years before the radiocarbon convention of AD 1950, while archaeological ages are normally expressed as radiocarbon years or calibrated years *BP* ('before present'). The responsible approach is to consider a broad window around 34,000 calibrated years ago, within Marine Isotope Stage 3, rather than imagine happenings on a particular day or in a particular year.

For Ireland, this is a threshold period: a cold, changing north-western landscape that still supported large mammals, but was moving towards the vastly more severe glaciation of the Last Glacial Maximum. The most directly relevant evidence comes from caves, especially Castlepook Cave near Doneraile in north County Cork. It provides a rare, incomplete and exceptionally important record of animals living in Ireland before the ice sheet reached its later maximum extent. It also contains a provocative possible trace of human activity. That trace deserves attention, but not certainty beyond what the evidence can bear.

A Landscape in Transition

Around this broad date Ireland lay at Europe's Atlantic north-western edge. Sea level was much lower than today because immense quantities of water were locked in continental ice sheets. The present coastline, Irish Sea and continental shelf cannot simply be projected backwards: exposed plains, changing channels and ice barriers altered routes between Ireland, Britain and continental Europe. Whether a particular crossing was practicable depended not only on distance, but on season, weather, sea ice, rivers

and the advance of glaciers. Later reconstructions show Ireland becoming fully engulfed at the Last Glacial Maximum, conventionally placed around 27,000–23,000 calibrated years BP; that maximum lay in the future of the date considered here.

The onset, extent and rhythm of ice growth remain active subjects of research. Some syntheses describe much of Ireland as ice-free until about 32,000 calibrated years BP, while newer reviews stress evidence for earlier, spatially varied glaciation and the difficulty of reconstructing a mobile British–Irish Ice Sheet. Thus it is unsafe to picture all of Ireland at 31,998 BCE as either a single unbroken ice cap or a hospitable, wholly ice-free plain. What can be said is that the climate was markedly colder than today, vegetation was open rather than wooded, and conditions were becoming more unstable and demanding.

In such a setting, ‘Ireland’ did not look like the green, hedged and wooded island familiar now. There were no oak forests, fields, bog-cut roads or settled coasts. Sparse grassland, herb-rich tundra-steppe vegetation, exposed limestone, river valleys and patches of bare or frost-shattered ground would have varied locally with altitude and proximity to ice. These are reconstructions from geological landforms, sediments, pollen and animal remains, not a view of one unchanging national landscape. Cold-stage environments could be productive for grazing animals in favourable seasons, yet they were vulnerable to abrupt climatic shifts.

Castlepook and the Animal Evidence

Castlepook Cave is central because it is Ireland’s richest known cave archive for vertebrate life leading up to the Last Glacial Maximum. Excavations conducted in the early twentieth century recovered more than 2,000 bones from its narrow galleries and chambers. Subsequent radiocarbon work indicates that the cave accumulated mammal remains over a very long span, approximately 45,700 to 19,950 years BP. That range is crucial: the assemblage is not a neatly sealed snapshot of a single year, generation or even millennium. Water disturbance, carnivore activity and antiquarian excavation have mixed and obscured parts of its history.

Nevertheless, the fauna establishes that Ice Age Ireland supported a striking range of mammals at different points in that long interval. Castlepook has yielded woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, with Arctic fox, wolf and lemmings represented in later cold-phase deposits. Reindeer and mammoth bones speak to open grazing landscapes; hyaena and wolf bones to formidable predators and scavengers. They do not prove that every species met at one place or one moment. Cave assemblages are shaped by how carcasses arrived, which animals used a cave, and which bones survived. At Castlepook, hyaena use is especially relevant: a carnivore den can collect prey remains without any human involvement.

The presence of this fauna matters for Irish history even where no people are demonstrable. It shows that the island was not simply an empty block of ice throughout the Late Pleistocene. Animals colonised or re-colonised changing landscapes, following ecological corridors that later vanished under sea or ice. Their populations were probably fragmented and repeatedly pressured by climate change. The later fate of Irish brown bears illustrates the point: modelling suggests that a small southern refugium would have been unlikely to sustain them through the Last Glacial Maximum, although the question has been debated through fossil and genetic evidence.

A Possible Human Visit

Public reporting in 2021 drew attention to a reindeer femur fragment from Castlepook Cave that had been recovered in 1972. Ruth Carden identified deep marks said to be consistent with butchery by a broad stone or flint tool, and radiocarbon dating was reported as placing the bone about 33,000 years ago. If the marks are confirmed as human-made and contemporaneous with the animal's death, the find would provide evidence that Upper Palaeolithic people reached Ireland far earlier than the formerly accepted late-glacial evidence. It would fit broadly with a period in which modern humans were present elsewhere in north-west Europe and depended heavily on large game, including reindeer.

But the wording matters. A cut-marked bone is evidence for an action on an animal carcass, not evidence for a village, a permanent population or a named cultural group. No securely associated hearth, stone-tool assemblage, dwelling floor, burial, artwork or human bone has yet established a 32nd-millennium BCE community in Ireland. The Castlepook human interpretation has not displaced the need for further peer-reviewed publication, re-excavation and securely stratified finds. Its archaeological setting is difficult precisely because the cave deposits have a long, disturbed history. The scientifically sound conclusion is that a short hunter-gatherer incursion is possible, perhaps to exploit reindeer, but sustained settlement remains unproven.

This distinction also prevents anachronism. These people, if present, cannot responsibly be called Irish in an ethnic, linguistic or political sense. There is no evidence for kingdoms, chiefs, tribal names, diplomacy, warfare, law, agriculture, trade networks or social institutions on the island at this date. Nor is there Irish evidence for religious ceremony, formal learning, monuments or art of this antiquity. Upper Palaeolithic societies elsewhere in Europe made sophisticated tools and powerful art, but similarities beyond Ireland cannot fill the evidential gap here. They offer context, not proof of equivalent activities at Castlepook.

Everyday Life: What May Be Inferred

If a small party did enter the island during this phase, its life would have been mobile and organised around survival in a cold open environment. Reindeer would have offered meat, fat, hide, sinew, bone and antler; stone tools could have served in dismembering and processing a carcass. Groups would have required detailed environmental knowledge, clothing, fire-making skills and social cooperation. Yet these are cautious inferences from the practical demands of Upper Palaeolithic hunting and the possible modification of the Castlepook bone, not observations of an excavated Irish camp.

Nor should the cave itself automatically be imagined as a home. Caves preserve bones well, but they may be places where carnivores dragged prey, water washed sediment, or people briefly sheltered. Castlepook's galleries were part of a karst system in limestone lowland, not a ready-made record of ordinary domestic life. The bones tell us more securely about Ice Age animal communities and palaeoecology than about human households. The lack of a surviving settlement record may reflect genuine rarity of human visits, but it also reflects later erosion, glacial scouring, rising seas and the uneven survival of evidence.

Why This Distant Moment Matters

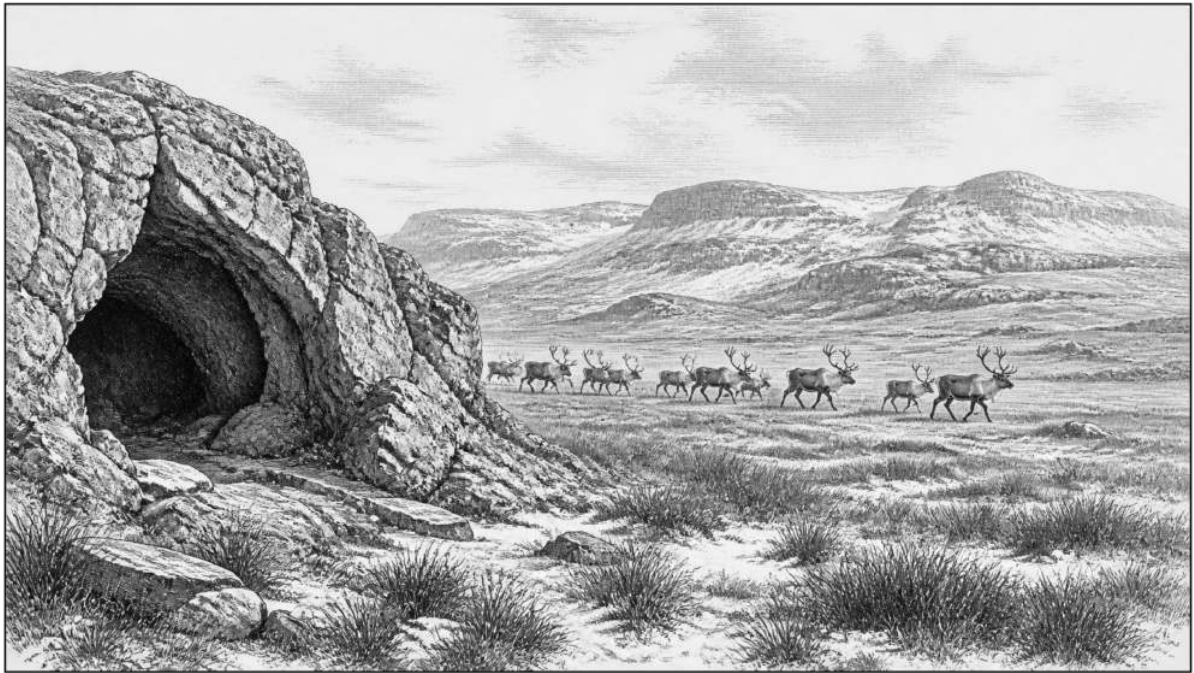
31,998 BCE therefore belongs less to conventional narrative history than to the preconditions of Irish history. It captures Ireland before permanent settlement, when climate and geography repeatedly remade the possibilities for animals and people. In the following millennia, the advancing ice sheet would erase or bury much of this earlier landscape. Far later, after deglaciation and renewed environmental change, a securely dated butchered brown-bear patella at Alice and Gwendoline Cave in County Clare dates to about 12,810–12,590 calibrated BP, and substantial Mesolithic settlement is evident only by about 8000 BCE.

The lesson is not that Ireland has a continuous human story stretching back to this exact calendar year. It is that the island's deep past is still being recovered from cave collections, re-dating programmes and environmental science. Castlepook's reindeer bone may eventually revise the chronology of first human contact; for now, it most responsibly signals a compelling possibility amid a well-attested Ice Age world of reindeer, mammoth, predators and approaching ice.

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31997 BCE

Ice Age Threshold^[4]



Modern calendar-year precision cannot be recovered for 31,997 BCE. The label is a retrospective point on a calendar created millennia later, rather than a date that Ice Age people could have recognised or recorded. In archaeological terms, it lies roughly 34,000 years before the 1950 reference point used for radiocarbon dating, within the Upper Palaeolithic and during the long build-up towards the Last Glacial Maximum. The responsible history of Ireland at this point is therefore not a narrative of a particular year, ruler or event. It is a carefully bounded account of a changing Ice Age landscape, its animals, and the very slight, still-developing evidence that people may have reached the island.

A Date Without Annals

There are no written sources, inscriptions, graves, houses, hearths or securely excavated tool assemblages from Ireland that can be assigned to 31,997 BCE. Nor can conventional radiocarbon ages be converted into a single historical year without qualification. Radiocarbon results must be calibrated against changing atmospheric carbon levels, and their outcomes are ranges of probability, not anniversary dates. For this early period, a cautious phrase such as *around 34,000 years ago* is more meaningful than an apparently exact year.

That caution matters especially in Ireland. The archaeological record has been repeatedly damaged, buried or redistributed by later ice advance, erosion, rising seas and the long history of cave disturbance. What survives is exceptionally uneven. Caves preserve animal bone better than exposed campsites; meanwhile, the most likely open-air places used by mobile hunters may lie beneath later sediments,

offshore, or have been removed by glacial action. Absence of a settlement is not proof that no person ever arrived, but it does mean that permanent occupation, population size and duration cannot responsibly be asserted.

Castlepook and a Tentative Human Trace

The closest evidence to this horizon comes from Castlepook Cave near Doneraile in north County Cork, one of Ireland's most important Ice Age fossil localities. Excavated principally in the late nineteenth and early twentieth centuries, it produced a huge, mixed collection of animal remains. Scientific reassessment has identified a rich pre-Last Glacial Maximum fauna: reindeer, woolly mammoth, giant deer, brown bear, wolf and the island's only known spotted hyena remains, among others. The cave was not a neat prehistoric floor sealed at one moment in time. Carnivores, water movement, earlier digging and later disturbance all helped create its complicated deposits.

A reindeer femur from Castlepook has been reported as bearing a cut mark consistent with butchery by a sharp stone tool, and has been presented in local heritage research as dating to about 31,000 BCE. If that identification and association are sustained by full specialist publication, it would indicate that people handled a reindeer in Ireland during the Upper Palaeolithic, vastly earlier than the long-established Mesolithic record. It would not, however, prove a village, a continuous population or even that hunters killed the animal at the cave. The bone may have been discarded elsewhere and subsequently dragged into the cave by scavengers. No securely associated stone tools, fire remains or human bones have yet established the character of this possible visit.

The distinction is important. Cut marks are physical evidence on a bone; interpreting them as the work of a travelling hunting party is a reasonable hypothesis, but remains an interpretation. At present, Castlepook offers a promising indication of brief human activity, not a detailed portrait of an Irish Upper Palaeolithic society. Future excavation, microscopic study of bone surfaces, new direct dates and the discovery of artefacts in undisturbed context could substantially alter that judgement.

Land Before the Ice Maximum

Ireland was not yet the familiar green and wooded island. It stood within the Late Pleistocene, an era of pronounced climatic swings. The British–Irish Ice Sheet was growing, but the evidence and ice-sheet modelling show that expansion was regionally asynchronous rather than a single instant when every part of Ireland vanished beneath ice. The greatest extent of the last ice sheet came later, broadly around 26,000–19,000 calendar years ago. Around the notional date of 31,997 BCE, conditions could vary greatly by region, altitude and century; it is misleading to picture either an entirely ice-covered island or a uniformly hospitable plain.

Castlepook's fauna nevertheless demonstrates that, in suitable intervals before the maximum cold, substantial herbivores and predators lived in, or moved through, parts of Ireland. Reindeer point to open, cold-adapted habitats with grasses, sedges, herbs, mosses and lichens rather than dense forest. Mammoth and giant deer reinforce the image of broad, productive open country in at least some periods, while brown bear, wolves and hyenas reveal a more complex food web. These animals should not be treated as a single snapshot: fossils accumulated over many thousands of years, and each species had its own ecological range. Yet together they overturn an older assumption that Ice Age Ireland was simply empty wilderness.

Sea levels were lower globally because vast quantities of water were held in ice sheets, changing the outlines of the surrounding shelf and coastal plains. But the precise practical routes between Ireland, Britain and continental Europe remain disputed, because ice cover, relative sea level, islands, channels and shorelines changed rapidly. It is safest not to imagine a straightforward dry road into Ireland. Any people represented by the Castlepook bone may have crossed a variable northern and western seaway or an ice-influenced landscape; the available evidence cannot choose confidently between routes.

People, If Present

If people did reach Ireland around this broad timeframe, they belonged to the wider world of Upper Palaeolithic hunter-gatherers, not to a known Irish tribe, kingdom or later ethnic community. There is no evidence from Ireland for an Aurignacian or Gravettian tool industry, language, personal name, artistic tradition or ancestry at this date. Such labels describe archaeological traditions recognised elsewhere in Europe; applying one to Ireland without diagnostic tools would turn possibility into fiction.

The reindeer evidence permits only modest inferences about everyday practice. Butchery implies knowledge of animal anatomy, cutting tools and the value of meat, hide, sinew, marrow and bone. A hunting party operating in a cold, open landscape would have needed portable clothing, effective shelters and close co-operation, as comparable Upper Palaeolithic groups elsewhere did. None of those items has been recovered from Ireland for this period, so they describe general human requirements rather than excavated Irish possessions. Nor is there evidence that people exploited mammoth, giant deer or hyena at Castlepook; their bones document fauna, not necessarily human prey.

No Politics, No Monuments

Political affairs, diplomacy and warfare cannot be reconstructed for 31,997 BCE. Those terms presume institutions, territories and relationships for which there is no Irish evidence. A small, seasonal party might have shared food, labour and knowledge, and may have moved within wider kin networks beyond the island, but this is an inference from hunter-gatherer lifeways rather than a documented Irish social order. There are likewise no grounds for identifying chiefs, alliances, territorial boundaries or conflicts.

Religion and culture are equally beyond direct recovery. Ireland has no securely dated Upper Palaeolithic cave art, carved object, burial or ritual feature from this horizon. Caves can acquire spiritual significance in many societies, but Castlepook's role as a bone repository does not make it a shrine. The most striking cultural fact is instead methodological: early excavators collected remarkable material, but their techniques did not provide the stratigraphic control expected today. Modern archaeologists, zooarchaeologists and geochronologists are extracting new history from those legacy collections while being frank about their limits.

Economy and Settlement

There was no farming, herding, metalworking, pottery production, market exchange or permanent settlement evidenced in Ireland at this date. If humans were present, their economy was foraging: hunting and processing wild animals, supplemented in principle by whatever plant, bird, fish or small-game

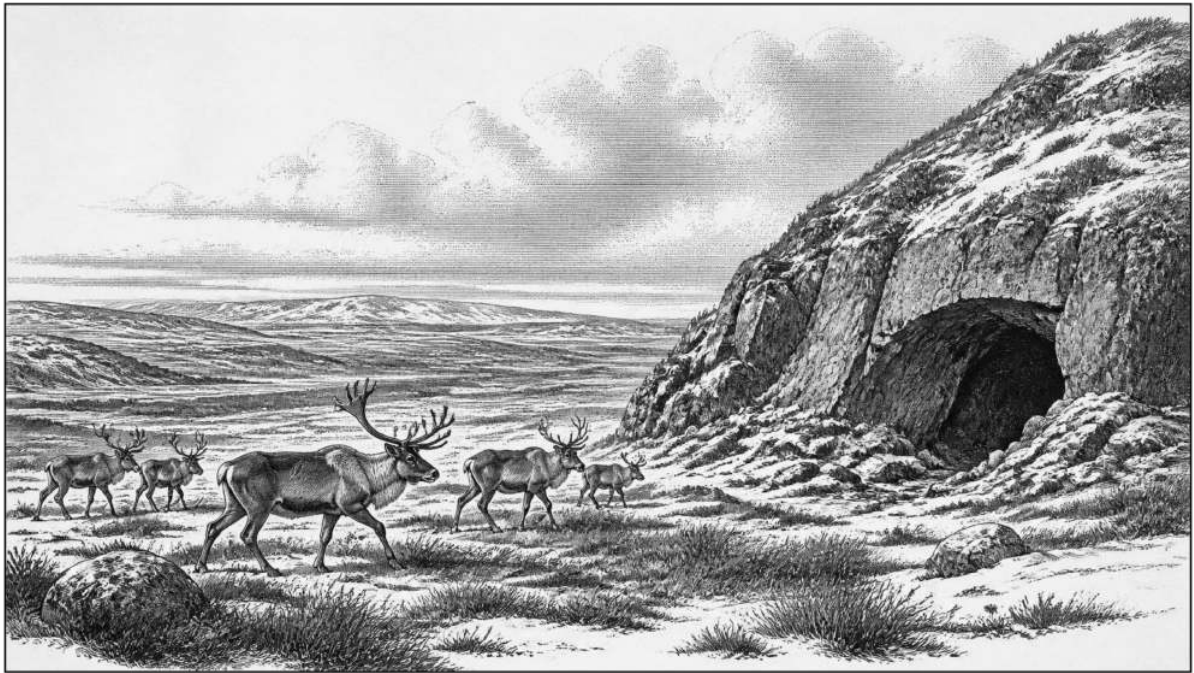
resources the local season offered. The direct Irish evidence supports only the possibility of reindeer butchery. It cannot tell us whether people stayed for hours, days or a season, how many came, or whether they returned.

This makes 31,997 BCE a threshold rather than a foundation year. It belongs before the later climatic deterioration that would cover much of Ireland with ice, and tens of millennia before the clear post-glacial settlement record, including the Mesolithic site at Mount Sandel. Its importance lies in recognising that the deep history of people in Ireland may be older and more episodic than once thought. The evidence is tantalising but narrow: a landscape inhabited by Ice Age animals, and a single reported human modification that invites further investigation rather than final certainty.

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31996 BCE

Castlepook's Cold-Stage Fauna^[5]



“31,996 BCE” is a modern retrospective label, not a date anyone living then could have named or recorded. It corresponds only approximately to 34,000 calendar years before 1950, the reference point used by archaeologists for “BP” dating. No evidence can identify an event in a particular Irish year, season or generation. The responsible history of Ireland at this point is therefore a history of landscapes, animal remains, cave deposits and the limits of archaeological inference. It belongs to the Middle Upper Palaeolithic world of Marine Isotope Stage 3 (MIS 3), during the long approach to the Last Glacial Maximum.

A Date Beyond Calendar History

Modern calibrated radiocarbon chronologies are expressed as ranges because each result has a statistical uncertainty and because atmospheric carbon levels changed over time. A date such as 31,996 BCE cannot simply be matched to a single radiocarbon measurement. The evidence most relevant to Ireland spans broad intervals: especially roughly 40,000–30,000 radiocarbon years BP in cave-fauna studies, and larger calibrated ranges around them. Nor should “Ireland” be imagined as an unchanging island. Sea levels were lower than today, coastlines lay farther out, and the Irish Sea basin had a different physical geography. Yet water, changing shorelines and ice were formidable constraints on movement.

This was not the Last Glacial Maximum itself. The fullest expansion of the British–Irish Ice Sheet is generally placed much later, around 27,000–23,000 calibrated years BP, when ice covered Ireland and much of its continental shelf. Around the notional year in question, conditions were already glacial, cold and unstable, but the available evidence indicates a more varied MIS 3 landscape than the later ice-bound maximum. Any map for this time is a reconstruction, not a contemporary survey: the outlines of ice and sea shifted repeatedly over millennia.

A Cold, Changing Country

Ireland lay on Europe's north-western Atlantic edge, exposed to rapid climatic swings recorded with much greater resolution in Greenland ice cores and North Atlantic sediments than in the Irish land record. Those distant archives establish that the last glacial period was not one uniform freeze. Abrupt warmer interstadials alternated with colder stadials. Their precise local expression in Ireland remains difficult to reconstruct, but the implication is important: habitats, animal ranges, snow cover and the viability of travel could all have altered far more quickly than a simple "Ice Age" label suggests.

At about this stage, parts of the island could support open cold-stage environments rather than later being wholly sealed below the maximum ice sheet. These were treeless or sparsely vegetated landscapes, broadly comparable to tundra-steppe mosaics elsewhere in north-west Europe, with grasses, herbs, sedges and low shrubs where soil, season and exposure permitted. They were not agricultural fields, native woodland or the familiar green pasture of later Ireland. Wind, frost action and seasonal meltwater shaped exposed ground; caves and fissures in the Carboniferous limestone of the south were traps and shelters for animals, and later repositories of the fragmentary evidence on which the period depends.

There is no basis for assigning a uniform temperature, snowfall total or vegetation cover to every region. Uplands, western Atlantic margins, river valleys and the limestone country of present-day Cork and Clare would have differed sharply. What can be said is that Irish environments were part of a wider north-west European cold-stage zone, while the growth of the British-Irish Ice Sheet increasingly narrowed the ecological and geographical opportunities available to plants, animals and any people who might have reached the region.

Castlepook and the Animal Record

The strongest evidence illuminating Ireland near this remote horizon comes from Castlepook Cave, near Doneraile in north County Cork. Excavations undertaken in the early twentieth century recovered a remarkably varied assemblage from cave passages and deposits: woolly mammoth, reindeer, giant deer, brown bear, wolf, foxes, mountain or Arctic hare, both collared and Norway lemmings, and spotted hyaena. Some material has been directly dated, and subsequent re-dating using improved collagen preparation has shown that earlier measurements could be substantially too young. The revised work places important elements of the southern Irish fauna in MIS 3 and indicates that giant deer and spotted hyaena may have disappeared locally before about 40,000 calibrated years BP.

These bones do not amount to a census of an Irish ecosystem. Cave deposits combine animals that died nearby, prey dragged in by carnivores, material moved by water or sediment, and finds whose original positions were disturbed by antiquarian excavation. Their dates need not all be contemporary. Nevertheless, the assemblage securely demonstrates that Ireland was intermittently accessible to an impressive cold-stage fauna before the Last Glacial Maximum. Mammoth and reindeer evoke open grazing country; lemmings reinforce the cold environmental signal; hyaena, wolf and bear show that predators and scavengers were also present.

In this setting Castlepook was probably more important as a carnivore den and natural bone-collecting place than as a human dwelling. Chewed bones and the distribution of remains are material clues to that distinction. The cave's scientific value lies precisely in its warning against easy narratives: the survival of a bone proves that an animal occurred in, or was transported into, the region at some point; it does not automatically prove a herd, a breeding population, a hunting ground or a settlement immediately outside the entrance.

The Question of Human Presence

The possibility of people in Ireland around this time is one of the most significant, but also most unsettled, issues. A reindeer femur fragment from the historic Castlepook collections has been reported as bearing marks consistent with butchery by a sharp stone tool and as dating to about 33,000 years ago. If both the age and anthropogenic interpretation withstand further scrutiny, it would indicate a fleeting Upper Palaeolithic human presence in Ireland far earlier than the once accepted post-glacial colonisation. It would fit a wider European world in which mobile *Homo sapiens* hunter-gatherers tracked seasonally available game.

That conclusion must remain conditional. The bone derives from old excavations rather than a newly excavated, securely stratified living surface. No unequivocal contemporary Irish stone-tool assemblage, hearth, built shelter, burial or repeated occupation layer has yet been published to accompany it. Cut marks are assessed through their shape, placement and microscopic characteristics, but carnivore damage, excavation damage and other processes must be excluded carefully. For good reason, the National Museum of Ireland continues to state that clear evidence for Palaeolithic human presence has not yet emerged. The contrast between that cautious institutional position and the exciting Castlepook claim is not a contradiction to be concealed: it is the present state of research.

Thus it would be wrong to write of an Irish “people”, tribe or permanent settlement in 31,996 BCE. At most, the evidence permits a hypothesis that small, highly mobile hunting parties may have entered or passed through parts of the region during favourable MIS 3 conditions. Even that would describe episodes, not continuous occupation. Their identities, language, kinship, numbers, routes and duration are unknown. The later, better-supported evidence for human activity at Alice and Gwendoline Cave in County Clare dates to the terminal Pleistocene, around 12,800–12,600 calibrated years BP, many thousands of years after this article’s notional date.

No Politics, No Recorded Beliefs

Political affairs, diplomacy and organised warfare cannot responsibly be reconstructed for Ireland at this date. There were no states, chiefs, boundaries or written records identifiable in the evidence. Nor can religion, art, learning or language be recovered from a faunal assemblage. It is possible that Upper Palaeolithic visitors elsewhere in Europe had sophisticated social lives, symbolic practices and far-reaching exchange networks, but importing those characteristics into Ireland without Irish artefacts would turn analogy into invention.

The same restraint applies to economy and trade. If people did reach Ireland, hunting and scavenging large mammals would be plausible subsistence activities, and stone tools would have been vital equipment; neither proposition proves an Irish economy or a trade route. There is no evidence here for farming, livestock, metalworking, pottery, monuments, villages or long-term domestic life. The relevant economy visible in the record is ecological: herbivores converting sparse vegetation into animal biomass, predators exploiting prey and carrion, and cave systems preserving selected remnants of those relationships.

Regional Change and a Fragile Archive

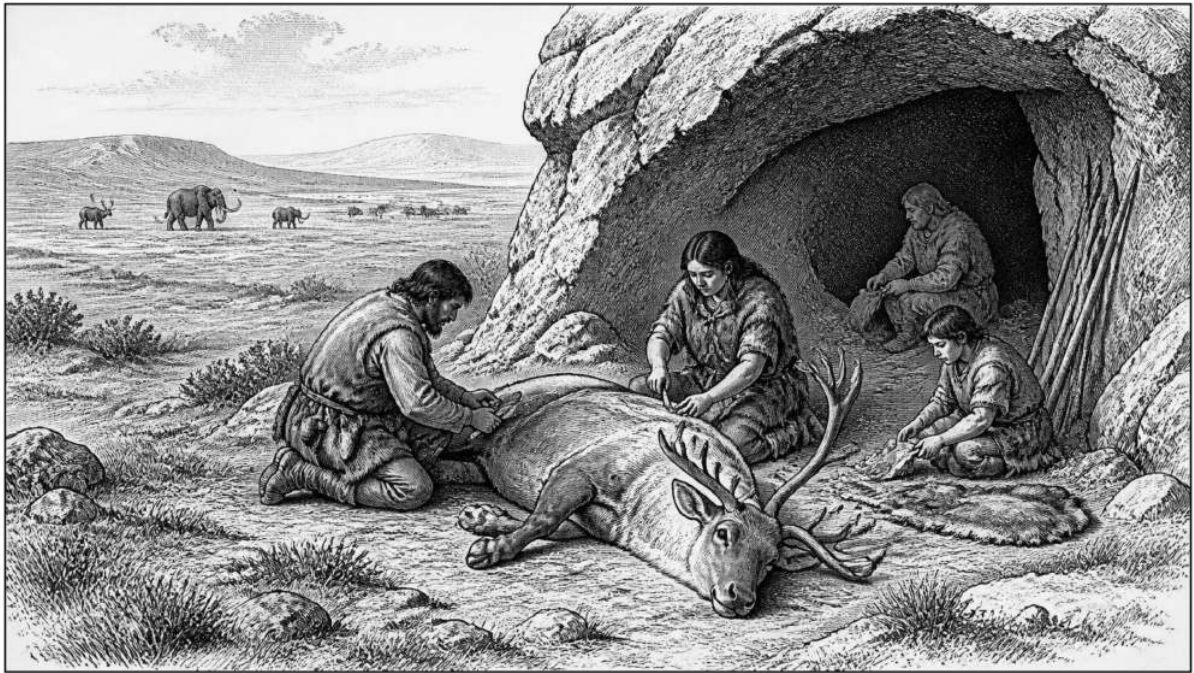
The most important development was environmental rather than political: Ireland stood within a cold, fluctuating north-west European world moving towards far more extensive glaciation. Later ice would erode, transport and bury older surfaces, while rising post-glacial seas would drown many former lowlands and possible coastal routes. This helps explain why the archaeological record is so thin. Absence of discovered camps is not absolute proof that no person ever arrived, but it is powerful evidence against confident stories of established occupation.

For Ireland in 31,996 BCE, then, the history is one of possibility bounded by proof. Cave bones establish a real cold-stage fauna; glacial science establishes profound climatic and geographic change; a modified reindeer bone raises the prospect of human contact. None permits a year-specific drama. The honest picture is of a precarious landscape, intermittently inhabited by Ice Age animals, with the human story still waiting for securely excavated evidence.

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31995 BCE

Cork Reindeer Butchery^[6]



“31,995 BCE” is a modern calendar label, not a date at which archaeology can identify an event in Ireland. There are no written records, named people, political communities or year-by-year chronologies for this depth of time. In radiocarbon and environmental terms, the label falls broadly around 34,000 years before present, within the Late Pleistocene and the Middle Upper Palaeolithic of north-west Europe. Any responsible account must therefore use ranges, deposits and individual specimens rather than pretend that a particular winter, journey or killing happened in this numbered year.

That caution matters especially in Ireland. The island’s archaeological record for this period is exceptionally thin, much of it disturbed by later ice, erosion and nineteenth- or early twentieth-century cave excavation. Yet a small body of faunal evidence, above all from Castlepook Cave near Doneraile in north County Cork, shows that parts of Ireland supported Ice Age animals during Marine Isotope Stage 3, before the Last Glacial Maximum. A reindeer bone from the Castlepook collection has been reported as bearing marks consistent with stone-tool butchery and as dating to about 33,000 years ago. It is an important claim, but it is not a fully excavated habitation floor with tools, hearths and human remains. It is best treated as evidence for a possible brief human presence or animal processing episode, not proof of a permanent Irish population or a settled community in 31,995 BCE.

Dating a Deep Past

The apparent precision of 31,995 BCE can be misleading. Archaeologists normally date this era in radiocarbon years before present (BP, where “present” is conventionally 1950), then calibrate those measurements against independent records of past atmospheric carbon. A radiocarbon result is not

automatically a calendar date: calibration can produce a range, sometimes a broad or discontinuous one. The most secure chronological language for Ireland at this point is consequently “about 34,000 years ago” or “during MIS 3”, not an exact annual anniversary.

There is a further distinction between the date of a bone and the date of human activity. A radiocarbon assay establishes when the animal died, within statistical limits; it does not by itself establish who handled it, where it was killed, or whether people lived nearby. Cut, chop or percussion marks may support an interpretation of butchery when their form and placement are persuasive, but cave deposits can be mixed by scavengers, water, sediment movement and excavation. Improved pretreatment and redating of bones from Castlepook and other southern Irish caves have substantially revised earlier results, in some cases making them thousands of radiocarbon years older. That is a reminder that the chronology is advancing, not closed.

An Ice Age Landscape, Not Yet the Maximum

At about 34,000 years ago Ireland was in the last glacial cycle, but it was not necessarily under a uniform, island-wide sheet of ice at every moment. The maximum expansion of the last British–Irish Ice Sheet came later, broadly between about 27,000 and 20,000 calendar years ago, with considerable regional variation in advance and retreat. Research on southern Ireland indicates that parts of the south coast remained ice-free until an advance after about 24,200 calibrated years BP. It follows that the Irish landscape around the date considered here cannot simply be imagined as a featureless white cap. Conditions changed sharply through time and differed between uplands, coasts and lowlands.

Where ground was exposed, the climate was cold and unstable by modern standards. Open vegetation, rather than the familiar Irish patchwork of woodland, pasture and fields, is the safest broad reconstruction. Grassland, herb-rich steppe-tundra and sparse shrub cover would have provided grazing and browsing, while frost, wind and seasonal scarcity shaped animal and human movement. Rivers carried sediment across valleys; sea level was far lower because vast quantities of water were locked in continental ice. Coastlines and the Irish Sea basin therefore looked very different, although lowered seas did not automatically create an easy, continuous dry route between Ireland and Britain at every stage.

Glacial action is itself part of the historical legacy of this period. Later ice eroded older surfaces, reworked sediment and removed or buried many sites that might otherwise have preserved camps, tools or bones. The scarcity of evidence is thus not evidence that nothing happened. It means that archaeology is working with a damaged and uneven archive. Caves, where bone can be protected from weathering, and offshore sediments, where ice-sheet movements can be reconstructed, are unusually valuable windows onto this lost world.

Castlepook and the Animals of Ireland

Castlepook Cave is central because it has yielded a rich assemblage from old excavations: remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena, among others. Not all of those remains belong to one moment, and not all are equally well dated. Nonetheless, red deer from Shandon and Ballynamintra caves have produced pre-Last Glacial Maximum calibrated ranges of about 32,930–29,594 cal BP, while reassessment of southern cave faunas points to a more substantial MIS 3 animal presence than older dating programmes had indicated. Ireland at this time was ecologically connected, at least intermittently, to wider north-west European faunal worlds.

The dramatic names need careful handling. “Irish elk” is the traditional name for *Megaloceros giganteus*, giant deer, an extinct Eurasian species rather than a species unique to Ireland; woolly mammoth and spotted hyaena likewise belong to a wider Pleistocene fauna. Their bones demonstrate that suitable habitats and movement routes existed at some points in the glacial cycle. They do not establish a single harmonious herd roaming every Irish county in 31,995 BCE. A cave bone assemblage may reflect animals that died naturally, were dragged in by carnivores, used a cave as shelter, or were deposited over many millennia.

Predators and scavengers are especially significant. Hyaena activity can accumulate and modify bones, creating deposits that may look superficially like the debris of a human meal. That makes the reported marks on the Castlepook reindeer femur consequential: if securely anthropogenic, they indicate skilled use of a sharp stone edge on fresh carcass tissue. If future study revises that judgement, the wider faunal evidence will remain, but the human story will become less certain. The difference is fundamental. The animals are directly evidenced; the exact nature, duration and frequency of human visits remain interpretation.

People: A Fleeting Possibility

If the Castlepook marks were made by people, the most economical interpretation is not a village but a small, mobile Upper Palaeolithic foraging party. Across north-west Europe before the Last Glacial Maximum, modern human occupation was generally sparse and often focused on landscapes that offered predictable game, stone, shelter and routes of movement. Reindeer could provide meat, marrow, fat, hides, sinew, antler and bone. A femur carrying butchery marks would fit carcass processing, perhaps after a hunt or after recovering an animal killed elsewhere. It cannot tell us whether the hunters arrived by sea, crossed temporary exposed landscapes, or made a longer stay in the region.

No securely associated lithic assemblage, hearth, dwelling, burial, personal ornament or rock art currently allows us to describe their language, kin groups, clothing, ritual practices or social rank in Ireland. It would be wrong to transfer the cave art, grave customs or elaborate ornaments known from other European Upper Palaeolithic regions directly onto Castlepook. Comparisons can suggest what was possible for contemporary hunter-gatherers, but they are not evidence that Ireland possessed the same traditions. Nor is there evidence here for farming, herding, pottery, metalworking, monuments, territorial states or named peoples.

For the same reason, political affairs, diplomacy and organised warfare cannot be recovered for Ireland in this year. There is no evidence for polities to negotiate, borders to defend or leaders to identify. Small foraging groups elsewhere could have maintained social networks over wide areas, exchanged knowledge and moved with seasons and prey; but in an Irish context at this date even that is an inference, not a documented fact. The most that can responsibly be said is that human survival, if people were present, depended on co-operation, knowledge of animals and landscapes, and flexible responses to climate.

Economy Without Agriculture

The economy suggested by the evidence is one of wild resources, not production. Reindeer is the only animal directly implicated in the reported human modification at Castlepook, so it should take precedence over a generic catalogue of Ice Age hunting. The marks may indicate the removal of meat or other soft

tissues. Bone-breaking for marrow, hide-working, antler preparation and transport of selected carcass parts are all plausible Upper Palaeolithic activities, but none has yet been demonstrated from an undisturbed Irish assemblage of this age.

Trade, in the later sense of regular exchange between communities, is equally invisible. A future discovery of imported stone raw material or a recognisable tool tradition might illuminate routes and contacts, but no such evidence is presently tied securely to this horizon in Ireland. The low sea levels of the glacial world altered distances and coastlines, yet water crossings, islands, ice margins and shifting channels still mattered. Ireland's position at Europe's north-western edge may help explain why evidence of occupation is so rare compared with Britain, northern France or Belgium, where Upper Palaeolithic sites are better represented.

What This Year Can Mean

The importance of 31,995 BCE is therefore not an event but a question. Ireland was an Ice Age land with an animal community far richer and stranger than the later historical fauna. Some areas could sustain reindeer, mammoth and carnivores before the last ice sheet reached its greatest extent. Castlepook Cave offers a tantalising indication that people may have entered that world and butchered reindeer there or nearby. But the evidence does not yet reveal a continuous human settlement, a culture name securely rooted in Ireland, or an ancestral line leading straightforwardly to later Irish populations.

That uncertainty is not a failure of history; it is the history. Each re-dated bone, microscopic study of a surface, carefully excavated cave sediment and reconstruction of an ice margin has the potential to alter the picture. Around 31,995 BCE, Ireland should be understood as a changing northern landscape at the edge of human and animal ranges: inhabited certainly by Ice Age fauna, possibly visited by Upper Palaeolithic people, and still awaiting the discoveries that could turn a fleeting footprint into a clearer human story.

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31994 BCE

Castlepook Reindeer Femur^[7]



31,994 BCE is not a year that can be recovered with modern calendar precision. It is a retrospective label for a point roughly 34,000 years before 1950, in the Late Pleistocene and broadly within Marine Isotope Stage 3 (MIS 3). The relevant archaeological and environmental dates are calibrated ranges, often with margins of centuries or millennia. Ireland has no securely dated settlement, named community, written record or political history for this precise moment. What can be responsibly described is an ice-age island or near-island landscape in profound climatic transition, and the sparse animal and geological evidence that survives from it.

A Pre-Glacial Peak in Ireland

This was before the Last Glacial Maximum, the phase when the last Irish Ice Sheet reached its greatest overall extent. It was not, however, a benign interval. The climate of MIS 3 was unstable, marked by sharp cold episodes and warmer interstadials. Ice sheets, glaciers, sea level, vegetation and animal ranges changed repeatedly over timescales far longer than a single human lifetime but short in geological terms.

For Ireland, the important point is regional variation. Research on the chronology of the last Irish Ice Sheet suggests that north-central Ireland remained ice-free until at least about 34,000 years ago. Organic deposits beneath later glacial tills in County Fermanagh provide a rare indication that land surfaces there had not yet been overridden by the expanding ice sheet. Marine-shell evidence from Donegal Bay likewise indicates periods of open water and nearby ice-free conditions during much of the preceding interval. These findings do not produce a neat nationwide map for 31,994 BCE. They do show that the ice sheet was building and expanding, rather than that every part of Ireland was already buried beneath its eventual maximum cover.

Southern Ireland was also not yet at the later glacial limit. Evidence from the south coast indicates that inland ice did not cross it until after about 24,000 years ago. By the global Last Glacial Maximum, conventionally dated around 26,500–19,000 years ago, ice had transformed much of the island. Around the date considered here, by contrast, the landscape was more likely a changing mosaic: exposed ground in some districts, mountains and uplands bearing ice, active rivers carrying sediment, and coastal environments altered by much lower sea levels. The familiar outlines of modern shorelines, lakes and river valleys should not be projected unchanged into this world.

Animals and Open Country

The strongest evidence for Ireland at this depth of time is palaeontological rather than archaeological. Cave deposits and museum collections show that a richer Pleistocene fauna reached Ireland during the period between at least about 45,000 and 20,000 years ago. The record is incomplete, much disturbed and repeatedly reassessed, but it establishes that large mammals could live in, or pass through, parts of Ireland before the great ice advance.

Castlepook Cave, near Doneraile in north County Cork, is especially important. Excavated principally in the early twentieth century, it produced a remarkable concentration of bones, including those attributed to reindeer, mammoth, giant deer, brown bear, wolf, Arctic fox, lemming and spotted hyaena. Such a list should not be treated as a photograph of one simultaneous ecosystem: cave carnivores accumulated prey, water moved bones, and early excavation removed most deposits before modern stratigraphic methods were available. Some specimens may represent different episodes separated by thousands of years. Nonetheless, improved radiocarbon pretreatment and redating have demonstrated that at least some southern Irish cave fauna belongs to MIS 3, well before the Last Glacial Maximum.

Reindeer are particularly relevant to a scene around 31,994 BCE. Their presence signals open, cold-adapted habitats rather than the dense Atlantic woodland that developed much later in the Holocene. The wider animal record suggests grassland, herb-rich steppe-tundra or patchy open vegetation, with local shelter determined by relief, soils, season and proximity to ice. Mammoth and giant deer remains add to the impression of a landscape capable, at intervals, of supporting large herbivores. Predators and scavengers, including wolves and spotted hyaenas, were part of the same broad ecological world. Yet fossil occurrence records cannot determine the size, continuity or exact distribution of their populations.

The Castlepook Question

The date has special interest because a reindeer femur from Castlepook has been presented as dating to about 31,000 BCE and bearing a mark interpreted by zoologist Ruth Carden as having been made by a sharp stone tool during butchery. If that interpretation is sustained, it would place human activity in Ireland far earlier than the island's formerly accepted Late Upper Palaeolithic evidence and close to the time represented by this article.

It must nevertheless be described as *possible* rather than conclusive year-specific proof of human occupation. The bone comes from an old cave collection, not from a newly excavated, undisturbed camp floor. No securely associated stone tools, hearth, dwelling, human remains or animal-processing area of comparable date has been recovered from Castlepook. The cave's deposits were heavily disturbed by carnivores, water and antiquarian excavation; later investigations have found only limited surviving Pleistocene material and stratigraphy. A radiocarbon date establishes the age of the animal bone, while the interpretation of a surface mark as a tool cut requires separate taphonomic judgement.

The responsible conclusion is therefore restrained. Around 31,994 BCE, north Cork contained, or was visited by, reindeer within an ice-age ecosystem. One reindeer bone offers a potentially important indication that people may have processed such an animal. It does not yet demonstrate a permanent population, a settlement at Castlepook, or a continuous human presence in Ireland. Archaeology advances precisely by testing such promising but fragile traces against new excavations, microscopic analysis and securely dated contexts.

People Beyond the Evidence

If small groups did reach Ireland at this time, they would have belonged to the wider Upper Palaeolithic world of north-western Europe. Across that world, people made sophisticated stone, bone and antler equipment; hunted and scavenged animals; processed hides; used fire; maintained social ties across substantial distances; and in some regions created portable and cave art. None of those practices can simply be assigned to Ireland in 31,994 BCE. There is no Irish assemblage of tools from this date with which to identify a particular technological tradition, such as the Gravettian, and no basis for naming a people or language.

Equally, there is no evidence for political institutions, rulers, warfare, diplomacy, farming, trade networks or formal religious monuments in Ireland at this date. These absences are not trivial gaps in a conventional historical narrative; they are the central fact of the record. A passing hunting party and a settled community would leave very different archaeological signatures, but neither has yet been securely identified for Ireland in this period. If people came, their movements may have been seasonal, intermittent and dependent upon changing animal routes and weather.

Travel itself remains an open question. Lower global sea levels changed the geography of the Irish Sea basin, but did not automatically create a simple and permanent land route from continental Europe to Ireland. Ice margins and sea passages changed through time. Any human arrival could have involved coastal movement, crossings over water or ice, or routes that are now submerged and difficult to investigate. The absence of clear evidence for boats is not evidence that no crossing was made; nor is it grounds for assuming one.

No Settlement Yet Known

The contrast with later periods is instructive. The earliest published direct evidence of human presence in Ireland that is generally treated as secure is a butchered brown-bear kneecap from Alice and Gwendoline Cave in County Clare, radiocarbon dated to calibrated ranges around 12,800–12,600 years before present, or roughly 10,800–10,500 BCE. Even then, the evidence suggests small-scale activity rather than a fully documented landscape of settlement. Substantial and widespread archaeological evidence for Mesolithic communities appears only from about 8000 BCE.

Thus, 31,994 BCE belongs to a much deeper and more tentative chapter. It is not the beginning of an identifiable Irish society, nor a date to which later Irish identities, religions or political traditions can be traced. It is a window onto the environmental preconditions of human history: a cold, open and changing Ireland; animal populations moving through habitable refuges; and perhaps one fleeting trace of people at the north-western edge of Upper Palaeolithic Europe.

What the Landscape Remembered

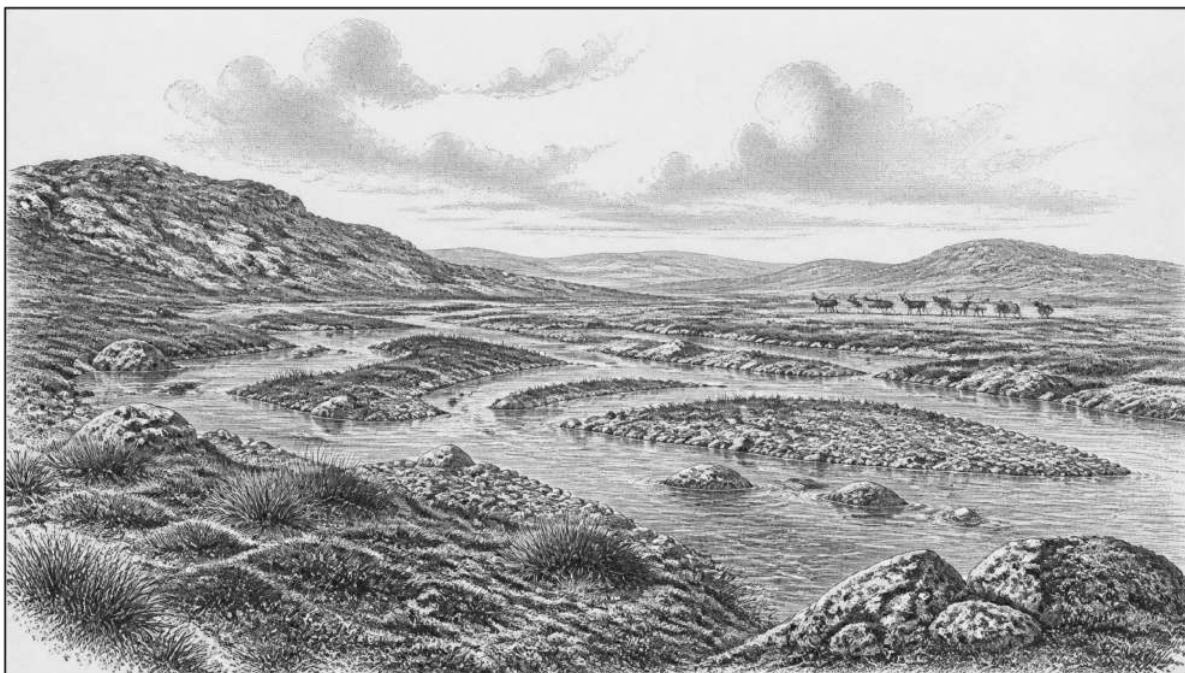
Although the human record is nearly silent, this period helped shape the physical Ireland inherited by later inhabitants. The ice that expanded after this interval eroded bedrock, deposited till, redirected drainage and contributed to the formation of drumlin fields, eskers, lake basins and sediment-rich lowlands. These processes did not occur in one event, and many landforms record later advances and retreats rather than conditions in 31,994 BCE itself. Still, the onset of the last major glacial build-up belongs to the long making of Ireland's terrain.

The historical lesson is one of scale and caution. Around this approximate date, there were no recorded leaders or battles to recover. There are instead calibrated dates, cave bones, glacial sediments and unresolved marks on a reindeer limb. Together, they reveal an Ireland that was ecologically active, climatically volatile and only possibly touched by human visitors—an important beginning not because it supplies certainty, but because it shows how much of the island's earliest past remains to be discovered.

Chapter 008 of 100

31993 BCE

Ireland Before Settlement^[8]



“31,993 BCE” is a modern calendar label, not a date that can be matched to a documented Irish event. At this depth of time, archaeological and environmental evidence is dated in broad calibrated ranges, often with sizeable uncertainty. In conventional terms this year falls roughly 33,900 years before AD 1950, within the later part of Marine Isotope Stage 3, a cold and highly variable phase of the Last Glacial Period. It was long before the Last Glacial Maximum, when ice later covered much or all of Ireland, and long before the island’s securely evidenced human settlement.

The responsible history of Ireland at this point is therefore not a story of named rulers, battles, settlements or monuments. It is a history reconstructed from cave deposits, animal bone, pollen, plant remains, sediments and glacial landforms. These sources can illuminate the physical world that later Irish history inherited. They cannot tell us what happened in one numbered year, nor support a claim that a particular person or community was living in Ireland in 31,993 BCE.

Dating a Deep Past

Calendar-year precision disappears rapidly in the Upper Palaeolithic. Radiocarbon measurements are reported as years “BP” — before AD 1950 — and must be calibrated against changing atmospheric carbon levels to estimate calendar ages. Near 34,000 years ago, dates may carry uncertainties of centuries or more; cave deposits can also contain bones accumulated at different times and later disturbed by water, animals or excavation. A specimen dated to a broad interval around this period is evidence for that interval, not for an event occurring on 1 January or any other day in 31,993 BCE.

For Ireland, the relevant archaeological-geological setting is usually called the Midlandian glaciation, the local expression of the last glacial cycle. The island’s ice history was not a simple advance followed by a simple retreat. Ice expanded and contracted asynchronously across Ireland, Britain and the

surrounding continental shelf. Modern reconstructions place the full, shelf-edge-reaching maximum considerably later, broadly between about 27,000 and 23,000 calibrated years BP in many sectors. Around the date considered here, Ireland was approaching rather than inhabiting that later maximum, and regional conditions could have differed sharply between uplands, interior basins and coasts.

A Cold, Open Ireland

The best direct environmental comparison comes from Derryvree in south Fermanagh. There, freshwater silts and sands preserved beneath later glacial deposits produced a radiocarbon determination of about 30,500 BP, with a substantial error range. The plants and small animals recovered from it indicate a periglacial environment with open tundra vegetation. Mosses and herbaceous plants survived in a landscape where dry ground could be sparsely vegetated; pollen of pine and hazel is interpreted cautiously because it may have travelled long distances rather than proving local woodland.

That evidence cautions against imagining a familiar green Ireland. At this broad stage of the glacial cycle, temperatures were low, seasons severe and trees locally scarce or absent in exposed regions. Frost action, seasonal thaw and sediment movement shaped slopes and valleys. Rivers carried meltwater and sediment, while lakes and wetlands formed in favourable hollows. The coastline was also unlike today's: global sea level was much lower because vast quantities of water were stored in ice sheets. Yet it would be misleading to draw a fixed shoreline for this single year. Relative sea level around Ireland depended both on global ocean volume and on the changing weight and movement of nearby ice.

Animals in a Connected Landscape

Ireland was not biologically empty. The extraordinarily important cave complex at Castlepook, near Doneraile in County Cork, has yielded the island's richest assemblage of Late Pleistocene vertebrate remains. Its Ice Age fauna includes woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox and spotted hyena, alongside lemmings and other smaller animals. The assemblage demonstrates that Ireland formed part of a wider north-west European world in which animals could disperse during favourable phases, rather than being an isolated Atlantic refuge throughout the glacial period.

But Castlepook is not a census of one moment. Bone deposits represent repeated episodes, some material was moved by water, and carnivores themselves helped accumulate remains. Recent redating has shown that several specimens once treated as broadly contemporary are older than previously thought. Research has consequently suggested that some animals, including giant deer and spotted hyena, may have disappeared locally before the Last Glacial Maximum. New sedimentary ancient-DNA work strengthens the case for faunal connections between Ireland and Eurasia before that maximum, but it remains a preprint and should be treated as developing evidence. The defensible conclusion is broad: cold-adapted mammals moved through Ireland during parts of this era; it is not possible to assign every species to 31,993 BCE.

No Demonstrated Human Community

There is presently no securely dated settlement, hearth, stone-tool assemblage, human burial or built structure in Ireland that can be assigned to around 31,993 BCE. Accordingly, no political affairs, diplomacy, warfare, trade network, language, religion or local culture can responsibly be described for Irish people in this year. The absence of evidence is especially significant because later glaciation eroded,

buried and rearranged much of the earlier landscape. It does not prove that no person ever entered Ireland during the wider Middle or Upper Palaeolithic, but it means that sustained occupation at this date has not been demonstrated.

The earliest published evidence interpreted as human activity in Ireland comes vastly later: cut marks on a brown-bear kneecap from Alice and Gwendoline Cave, County Clare, dated to approximately 10,800–10,500 BCE. That find has transformed discussion of the island's Late Palaeolithic, though its archaeological context has been carefully re-examined. Clearer, more substantial evidence for settlement belongs to the Mesolithic, beginning around 8000 BCE, with sites such as Mount Sandel in County Londonderry. Even those pioneering hunter-gatherer communities were separated from 31,993 BCE by more than twenty-three millennia of climatic upheaval, ice advance, retreat and changing sea routes.

Claims that humans were present in Ireland around 33,000 years ago require particular restraint. Some recently discussed animal bones from Castlepook may show possible human modification, and work at the cave continues. Possible cut marks or a single altered bone, however, do not establish a settlement, a population, or a year-specific episode. Archaeologists distinguish between a suggestive trace, a reproducible identification of butchery, and a contextualised assemblage of tools, food remains and occupation surfaces. For this year, Ireland's human story remains unproven rather than merely incomplete.

Society, Economy and Belief: What Cannot Be Claimed

It is tempting to fill this silence with a generic picture of “Ice Age hunters”. That would confuse evidence from continental Europe and Britain with evidence from Ireland. Upper Palaeolithic people elsewhere in Europe made sophisticated stone and bone tools, travelled long distances, hunted and scavenged large animals, created art and maintained social relationships across extensive territories. Such comparisons help explain what human life *could* have involved at the north-western edge of Europe. They do not show that such people were living on the Irish landmass at this time.

There is likewise no basis for describing Irish houses, clothing, food preparation, exchange, ritual practice or learning in 31,993 BCE. No Irish cave art, portable art, burial, ceremonial deposit or domestic assemblage of this age is known. The cave evidence instead speaks most clearly about animal ecology and geological preservation. Castlepook may at times have been used by hyenas, which helps explain why it contains so many bones; it should not be represented as a human camp without corroborating artefacts and securely associated deposits.

Regional Change and Historical Importance

The great development of this period was environmental instability. Cold open habitats could permit large herbivores and their predators to range across connected territories, while later ice growth would radically reduce habitable ground and reshape drainage, soils and coasts. The eventual maximum of the British-Irish Ice Sheet scoured landscapes and deposited till, moraines and outwash sediments that remain visible in Ireland today. This later glacial transformation also helps explain why evidence for earlier people, if it ever existed, is so elusive.

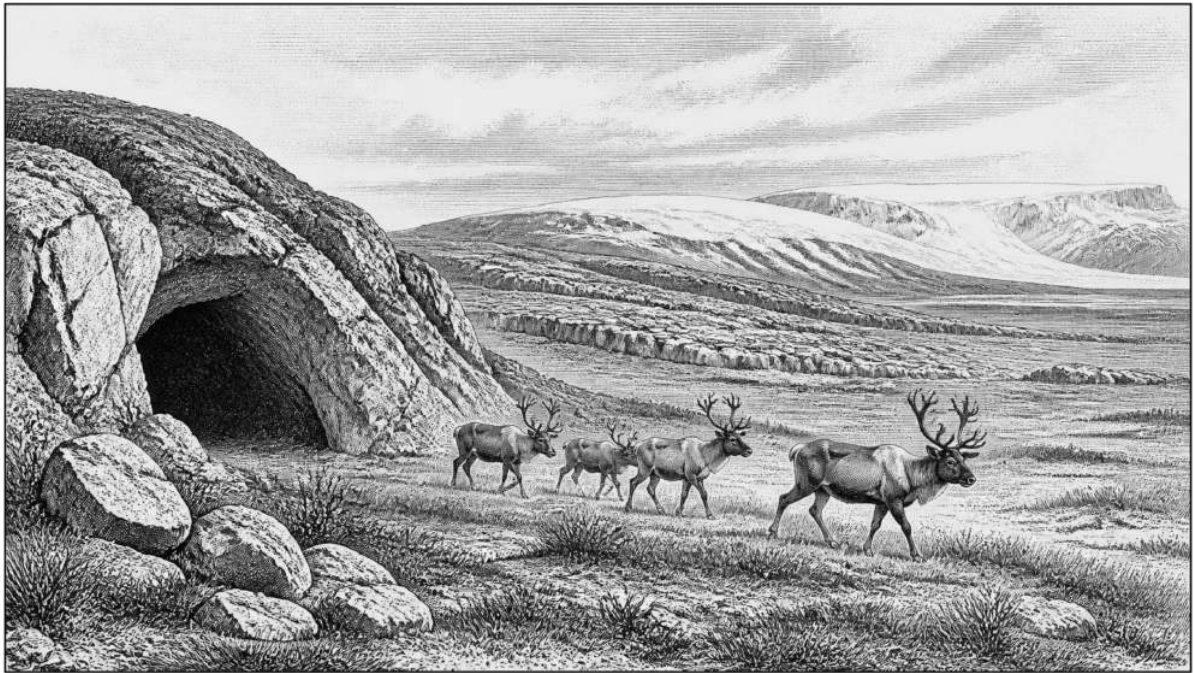
Thus Ireland in the vicinity of 31,993 BCE should be understood as a changing Pleistocene landscape, not yet a historical society. Fermanagh's tundra deposits and Cork's cave fauna offer rare windows onto its plants and animals; glacial research places them within a dynamic North Atlantic climatic system. The

most important fact is also the simplest: this was Ireland before demonstrated settlement. Its record is one of environments, animals and geological processes, awaiting further discoveries that may refine the broad ranges but will never turn this modern numbered year into an exact prehistoric anniversary.

Chapter 009 of 100

31992 BCE

Castlepook Reindeer Butchery^[9]



The label 31,992 BCE is a modern chronological convenience, not a date that people living in prehistoric Ireland could have named or recorded. Nothing in the evidence can be fixed to that individual calendar year. The responsible approach is therefore to look at the calibrated ranges and geological sequences that bracket it. This was the later part of the Upper Palaeolithic, within Marine Isotope Stage 3 and close to the long climatic deterioration that led into the Last Glacial Maximum. For Ireland, it was a world without farming, writing, towns, named rulers or recoverable political communities. What can be investigated is a changing Ice Age landscape, the animals which used it, and one exceptionally early but still limited indication that humans may have entered it.

A Date Beyond Annual History

At this depth of time, even apparently exact scientific ages need careful handling. Radiocarbon laboratories produce ages in radiocarbon years before present; archaeologists then calibrate them against changing atmospheric carbon levels, producing probability ranges rather than a single true year. Geological reconstructions add further uncertainty because they combine dates from caves, sediments, landforms and marine cores. Accordingly, 31,992 BCE should be read as “about 34,000 years ago”, not as a point at which a specific event happened. It belongs to a broad interval in which Ireland’s climate, ice cover and coastlines were changing, sometimes rapidly by Pleistocene standards.

The period matters because it falls near the beginning of the final great expansion of the British–Irish Ice Sheet. Reconstructions do not give a single, uncontested picture of Ireland at precisely this moment. Some evidence indicates that much of the island remained ice-free until roughly 32,000 years ago, followed by swift ice-sheet growth; other reconstructions model substantial ice in the north-west and

smaller ice fields or glaciers in several upland districts by about 31,000 years ago. The defensible conclusion is regional rather than absolute: Ireland was entering a severe glacial phase, with expanding mountain and ice-sheet ice, but not necessarily an island uniformly buried beneath it on every day or in every locality.

A Northern Cork Clue

The closest archaeological evidence relevant to this era comes from Castlepook Cave, near Doneraile in north County Cork. Its limestone passages yielded a large collection of Pleistocene animal remains during antiquarian excavations, much of it now held in museum collections. Reassessment of such collections has transformed the study of Ice Age Ireland: individual bones can now be identified more securely, examined microscopically and directly dated by accelerator mass spectrometry. Castlepook is especially valuable because its deposits preserve evidence from before and after the Last Glacial Maximum, although the early digging and the complicated cave sediments mean that associations must be treated with restraint.

A reindeer femur from Castlepook, reported in 2021 as about 33,000 years old, bears deep marks interpreted as having been made during butchery with a stone tool. If that interpretation is sustained by further analysis, it is the earliest known sign of human activity in Ireland and lies very close to the broad timespan represented by 31,992 BCE. It would demonstrate that people handled and processed a reindeer on, or after reaching, the island. It does *not* demonstrate a permanent settlement, a family group, a camp at the cave, or continuous occupation of Ireland. The bone dates the animal's death, while the old collection's archaeological context is not equivalent to a modern, tightly excavated living floor.

That distinction is crucial. Ireland's first securely documented substantial settlement belongs far later, in the Mesolithic. Mount Sandel on the River Bann, County Londonderry, has dated huts, pits and stone artefacts from around 9,800–9,600 calibrated years before present. The intervening gulf is immense. A possible Upper Palaeolithic visit at Castlepook should not be turned into an unbroken ancestry for later Irish populations, still less into a story of an established “first Irish” society. It is better understood as evidence for an episode of human presence—or perhaps repeated brief presences—that remains archaeologically elusive.

Landscape, Ice and Animals

For the living landscape around this time, animal remains offer firmer evidence than human artefacts. The Irish Quaternary Fauna Project established that a varied mammal fauna occupied Ireland during parts of the period between at least about 45,000 and 20,000 years ago. Castlepook has produced remains attributed to reindeer, brown bear, giant deer, woolly mammoth, wolf, Arctic fox, lemmings and spotted hyaena. Yet this is not a ready-made list of creatures seen together in 31,992 BCE. Cave deposits can contain material from many millennia, and improved pretreatment and redating have shown some earlier dates to be significantly too young. Several species, including giant deer and spotted hyaena, may have disappeared locally before the later growth of the ice sheet.

The most defensible scene is therefore a cold, open and variable environment, not a cinematic parade of every Ice Age animal. Reindeer are directly relevant because of the Castlepook femur; their presence would fit a landscape with productive seasonal grazing. Brown bears, carnivores and scavengers also used caves and their surroundings, while some bones may have been carried into caves by animals rather than

people. Tree cover was greatly restricted in colder phases, and exposed ground, grasses, herbs, sedges, rock and patches of snow would have shaped many areas. Sheltered valleys and southern lowlands could have differed markedly from high mountains and the expanding ice margins.

Sea level was lower than today because so much water was locked in northern ice sheets, altering the outline of the Irish coast and extending the continental shelf. But lower sea level does not solve the practical question of human arrival. The evidence does not permit a confident reconstruction of the route taken by whoever butchered the Castlepook reindeer. They may have crossed short stretches of water, travelled along changing coasts, or reached Ireland during a particular configuration of ice and sea. Later glaciation, erosion and post-glacial marine inundation have destroyed or concealed much of the landscape in which any such journey occurred.

Society Without Institutions

There is no evidence for political affairs, diplomacy, warfare, territorial states, chiefs or named communities in Ireland at this time. It would be misleading to imagine tribes occupying fixed borders merely because a single animal bone may record human work. Similarly, there are no excavated houses, hearths, burials, tool-making floors, clothing, art objects or deposits that can securely reveal religion, language, teaching, kinship or customary law around 31,992 BCE. The silence is archaeological, not a claim that visiting people lacked culture. Any Upper Palaeolithic people who reached Ireland would necessarily have possessed knowledge, skills and social relationships; the problem is that those qualities cannot yet be described from Irish evidence.

The possible cut-marked femur nevertheless allows one modest economic inference. If the marks are indeed human-made, they show practical knowledge of carcass processing: meat, sinew, marrow, hide or bone may all have been useful. Reindeer itself was a mobile resource, so the find may point to hunting or opportunistic use of a carcass rather than a settled food economy. There is no basis for identifying specialised exchange networks, regular maritime trade, or sustained exploitation of particular territories in Ireland. Nor can the femur establish whether the animal was killed nearby, brought to the cave, or encountered after death. The evidence supports careful possibilities, not a detailed reconstruction of an Ice Age household.

Why the Record Is So Thin

Ireland's Upper Palaeolithic record is unusually fragile. Much was overwritten by later ice movement; caves were repeatedly used by animals, disturbed by natural processes and excavated before modern recording standards; former coastlines now lie offshore; and any lightly built camps on exposed ground had poor prospects of survival. The absence of sites is therefore not proof that no people ever entered Ireland. Equally, a sparse record cannot be made to prove large populations. This preservation problem is why re-examining museum collections, applying improved radiocarbon methods and investigating undisturbed cave sediments remain so important.

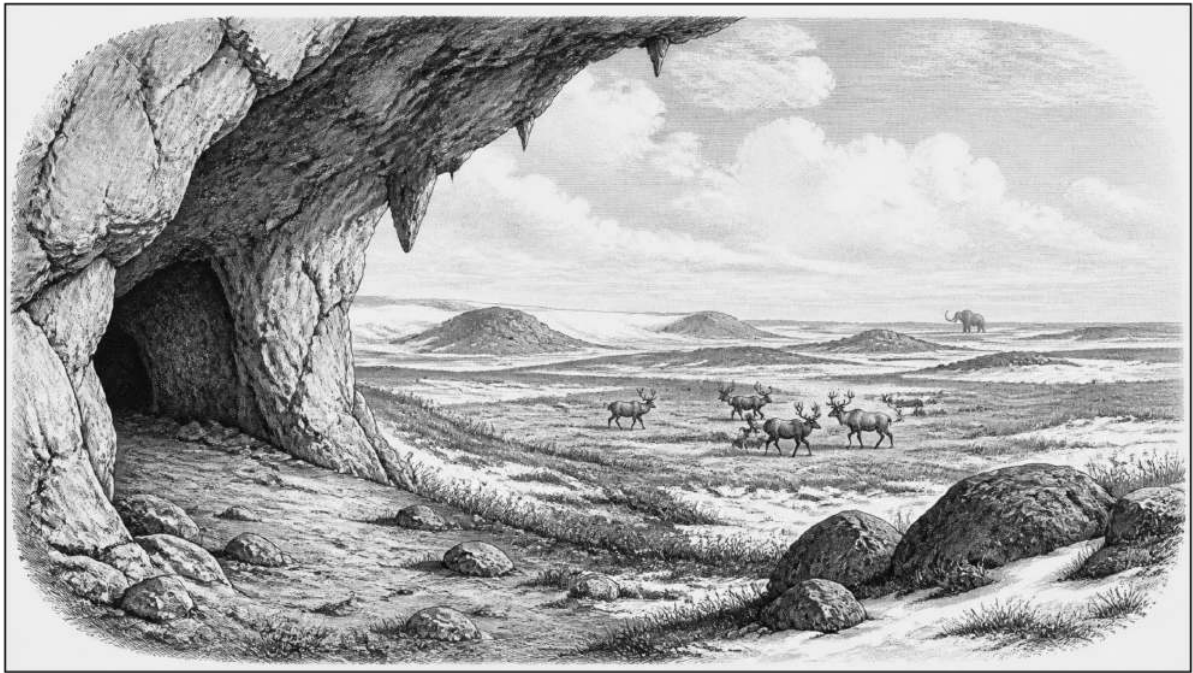
Thus the principal Irish development appropriate to this date is not a reign, battle or foundation, but a threshold in deep history. Around the broad span represented by 31,992 BCE, Ireland was becoming a harsher glacial landscape and may have received brief human visitors. Castlepook Cave offers a tantalising indication of reindeer butchery close to this era; its significance is great precisely because the

surrounding evidence is so slight. The responsible historical picture is one of uncertainty bounded by material facts: a changing island landscape, Ice Age animals, expanding ice, and the possibility—rather than the demonstrated permanence—of human presence.

Chapter 010 of 100

31991 BCE

Atlantic Ice Sheet Growth ^[10]



“31,991 BCE” is a modern way of labelling a point unimaginably far beyond written history. It must not be mistaken for a date that anyone then recorded, or for a year to which Irish archaeology can attach an event. In archaeological terms it falls roughly 33,940 calendar years before AD 1950, the conventional reference point for *cal BP* dates. At this depth of time, radiocarbon results have ranges, are revised as calibration improves, and seldom permit calendar-year precision. The responsible subject, therefore, is Ireland in the later part of Marine Isotope Stage 3 (MIS 3), shortly before the most severe phase of the last glaciation—not an invented episode in a named year.

A Changing Ice-Age Frontier

Ireland at about 32,000 BCE was not the familiar green and wooded island of later millennia. It lay on the north-western edge of Europe during a long cold phase marked by abrupt climatic shifts. The full Last Glacial Maximum, when the British–Irish Ice Sheet reached its greatest extent, lay ahead, conventionally placed around 26,000–19,000 years ago. Yet the ice sheet was already developing, and conditions varied sharply across regions and through time. Modern reconstructions model the growth and retreat of this ice complex from around 31,000 years ago, but their resolution is measured in millennia, not individual seasons or named BCE years.

The best broad inference is that at this date substantial parts of Ireland could still support cold-adapted animal communities, even as glaciers and perennial snow affected uplands and the climate deteriorated. Earlier work has suggested that Ireland remained largely ice-free until around 32,000 cal BP; newer ice-sheet research stresses that the onset, extent and behaviour of ice were regionally complex. It would be

unsafe to draw a single, neat boundary across a map for 31,991 BCE. What is secure is that the landscape was heading towards a transformation severe enough to remove or bury much earlier evidence beneath later ice and sediment.

Sea level was much lower than today because water was held in continental ice sheets. The exposed shelves around Ireland altered distances, coastlines and possible routes for animals and people. However, a simple claim that Ireland was joined to Britain by one continuous, easily crossed land bridge is not supported by all reconstructions. Researchers have long debated the nature, timing and usefulness of possible connections across the Irish Sea; some envisage corridors or intermittent links, while others stress marine barriers and ice. For this period, movement into Ireland is best treated as possible within a changing north-west European landscape, not as a certainty that can be mapped precisely.

What the Caves Preserve

The most important Irish evidence comes not from a village, grave or hearth, but from caves and their fossil collections. Castlepook Cave, near Doneraile in north County Cork, is especially significant. Excavations there recovered a large and mixed Ice-Age fauna, including reindeer, woolly mammoth, giant deer, brown bear, wolf, foxes, hares, lemmings and spotted hyaena. Reassessment of the cave's radiocarbon chronology places important parts of this fauna in MIS 3, with some animals present in southern Ireland between roughly 45,000 and 33,000 calibrated years ago. That broad range encompasses the archaeological horizon relevant to this article, although it does not date every bone, animal or activity to 31,991 BCE.

This assemblage gives the strongest picture of Ireland's environment. Reindeer and lemmings point towards open, cold landscapes; mammoths indicate that at least some habitats could sustain large grazers; hyaenas, wolves and bears reveal a food web with substantial predators and scavengers. The scenery should not be imagined as a uniform, featureless snowfield. A patchwork of grassland, herb-rich tundra, exposed ground, rocky shelter and seasonal snow is more plausible, with local conditions governed by altitude, shelter, drainage and proximity to ice. Caves themselves were not necessarily human homes: they could be dens, traps, scavenging places or repositories into which water, animals and people introduced bones over long periods.

The cave record is both precious and difficult. Much of the material was dug in the late nineteenth and early twentieth centuries, before modern excavation standards. Deposits were often disturbed, their layers incompletely recorded, and bones from different periods could be brought together by geological processes or earlier digging. The Irish Quaternary Fauna Project, later re-dating programmes and renewed excavation have therefore been essential. They do not merely add dates; they test whether an old label, a bone surface or a reported layer can still bear historical weight. The lesson is caution: Ireland's sparse Palaeolithic archive is real, but it is not a complete census of life or human activity.

The Human Question

There is no securely dated human skeleton, dwelling, hearth, tool-kit or burial from Ireland that can be assigned to 31,991 BCE. Nor is there evidence for a continuously occupied population at this time. The nearest relevant indication is a reindeer femur from Castlepook Cave reported as bearing a cut mark and dated to about 33,000 years ago in public accounts. It raised the possibility that people handled or

butchered an animal in Ireland during the Upper Palaeolithic. That possibility is important, but it must not be enlarged into a story of permanent settlement, a named migration or a particular hunting party operating in this calendar year.

Interpretation is especially delicate because cut marks must be distinguished from damage caused by carnivore teeth, trampling, excavation tools, sediment movement or later handling. A single modification on a bone can establish a question, rather than settle it. The direct date concerns the animal bone, not necessarily the moment at which a person cut it; its archaeological context also matters. Ongoing work at Castlepook, including fresh sampling of undisturbed deposits and applications of radiocarbon, luminescence, uranium-series methods and sedimentary ancient DNA, is precisely the kind of research needed to test these early claims. A recent genetic study of cave sediments, currently a preprint rather than a final peer-reviewed article, supports broad faunal connections between Ireland and Eurasia before the Last Glacial Maximum, but it cannot by itself prove human occupation.

For comparison, the more secure direct evidence of Palaeolithic human activity in Ireland belongs much later, at Alice and Gwendoline Cave in County Clare. A brown-bear patella with marks interpreted as butchery produced a calibrated range of about 12,810–12,590 cal BP. This is compelling evidence for a late, brief human incursion, but it is more than twenty millennia after the date considered here. It demonstrates both that Palaeolithic people could reach Ireland and that discoveries once thought impossible can emerge from old museum collections. It does not fill the immense chronological gap between Castlepook's MIS 3 fauna and the terminal Pleistocene.

Life Without a Recorded Society

If people did enter Ireland around this period, they would have been Upper Palaeolithic hunter-gatherers, arriving in very small, mobile groups rather than members of an Irish nation or settled farming community. They may have followed seasonal animal movements, sought carcasses, hunted when opportunities allowed, or explored unfamiliar ground. Stone tools, wooden implements, clothing, shelters and fires would be expected in a wider Upper Palaeolithic world, but none can responsibly be claimed for Ireland at 31,991 BCE without direct evidence. A cut-marked reindeer bone would demonstrate processing of animal tissue; it would not show whether the animal was hunted, scavenged, shared, traded or encountered by a group staying for days rather than generations.

Accordingly, political affairs, diplomacy and warfare cannot be reconstructed. There were no states, kingdoms, chiefs or borders documented in Ireland, and no evidence from this date for organised conflict. It is reasonable to suppose that mobile groups elsewhere in north-west Europe maintained kin ties, exchanged knowledge and negotiated access to hunting grounds. It is not reasonable to call such relationships Irish diplomacy, or to project later tribal names, languages or identities backwards across more than thirty millennia. The same restraint applies to economy and trade. There is no evidence for markets, exchange networks, farming, herding, metalworking or seaborne commerce in Ireland at this date.

Religion, art and learning are also beyond recovery in specifically Irish form. Upper Palaeolithic peoples elsewhere in Europe made sophisticated art, ornaments and ritualised objects, and possessed detailed practical knowledge of animals, weather, stone and seasonal change. Ireland has yielded no comparable art, sacred site, burial rite or symbolic object securely attributable to about 32,000 BCE. Absence of evidence is not proof that people lacked beliefs or stories; it means that archaeology cannot

describe them here. The intellectual achievement visible in the surviving record is instead modern: the painstaking ability to read climate, animal bone, sediments, isotope signals and damaged surfaces without pretending they are a written chronicle.

Disappearance and Deep Time

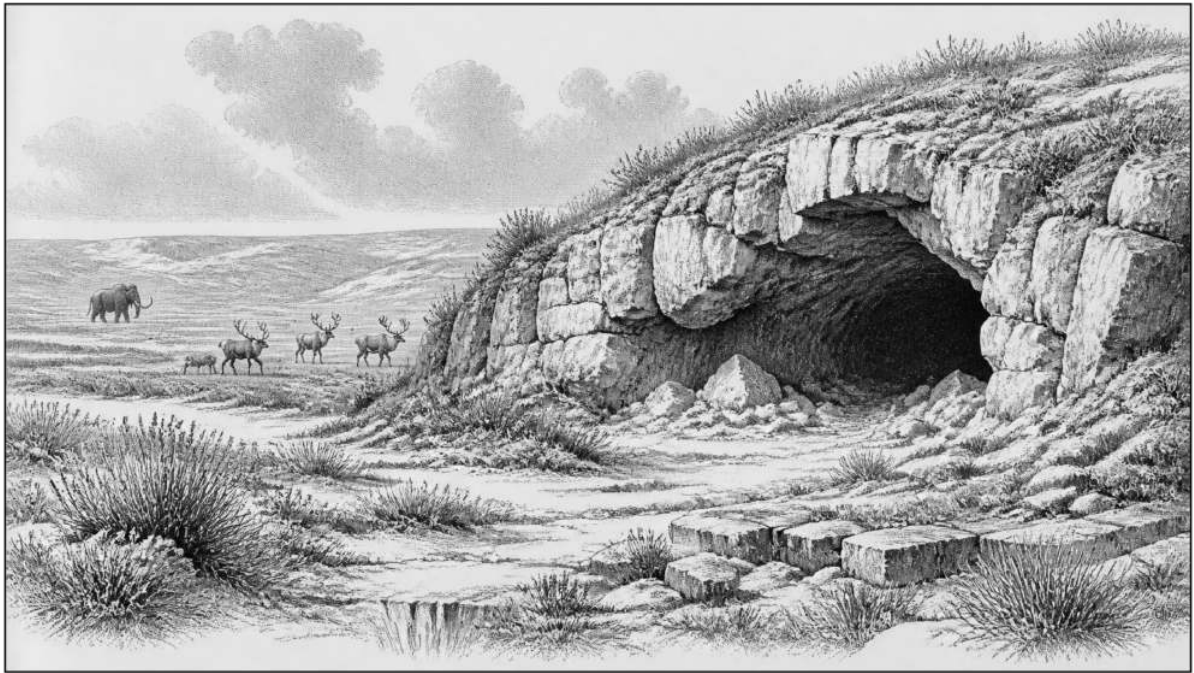
The central historical development around this date was environmental instability. A land that had supported Ice-Age mammals moved towards far harsher conditions as ice expanded. Later glaciation reshaped valleys, transported sediments and destroyed many open-air traces that might otherwise reveal human visits. Geomorphological research shows how profoundly the eventual ice sheet reached across western and southern Ireland, while the modern Irish landscape still retains its legacy in glacial landforms. The thinness of the early archaeological record is therefore partly a history of loss, not necessarily proof of an empty island.

For Ireland in 31,991 BCE, the soundest conclusion is modest but remarkable. The island formed part of an Ice-Age ecological frontier inhabited by cold-climate mammals, documented most clearly in caves such as Castlepook. There may have been fleeting human contact with that world, perhaps including the processing of reindeer, but no evidence yet supports a settled community or a year-specific historical narrative. The date belongs to prehistory at its most demanding: a period illuminated by calibrated ranges and physical traces, where evidence must remain distinct from the attractive stories it may one day make possible.

Chapter 011 of 100

31990 BCE

Castlepook's Pleistocene Fauna^[11]



“31,990 BCE” is a modern calendar label, not a date at which an Irish event can be placed. No written record, settlement sequence or annually resolved chronology exists for Ireland at this depth of time. In archaeological terms, the label points only broadly to the middle of the Late Pleistocene, within Marine Isotope Stage 3 (MIS 3), roughly 57,000–29,000 years ago. Calendar conversion is itself approximate: radiocarbon results require calibration, and calibrated age ranges—not a single BCE year—are the responsible language for this period. The question is therefore not what happened in Ireland in one numbered year, but what the fragmentary evidence permits us to say about the island and its inhabitants, if any, around the equivalent of about 34,000 calibrated years before present.

An Island on the Edge

Ireland then lay at the far north-western edge of the European world. It was not yet in the full Last Glacial Maximum, conventionally dated to about 26,500–19,000 years ago, when an Irish sector of the British–Irish Ice Sheet covered the island and much of its surrounding shelf. Ice-sheet reconstructions instead indicate a complex, uneven build-up: the wider ice sheet expanded rapidly between roughly 31,000 and 26,000 years ago, while different regions reached their maxima at different times. It would be unsafe to draw a sharp ice margin across a map for 31,990 BCE. Nevertheless, the date belongs to the climatic deterioration before the maximum glaciation, when northern environments were becoming more severe and ice was an increasingly decisive force in shaping the region.

The familiar outline of modern Ireland is also an unreliable guide. Sea level was much lower globally because enormous quantities of water were locked in ice. Continental shelves now beneath the Atlantic, Celtic Sea and Irish Sea were exposed or differently configured, while crustal movement under the

changing weight of ice complicates every reconstruction of former coasts. Ireland's precise connection or separation from neighbouring land at this early point remains a matter for palaeogeographical reconstruction, not an assumption that can be read from a modern map. What is clear is that its western location made it ecologically peripheral: any animals or people reaching the landmass had done so within a changing northern European landscape, whose routes, shorelines and barriers repeatedly altered over millennia.

Castlepook and the Animal Record

The strongest evidence relevant to this date comes from caves rather than settlements, above all Castlepook Cave—also called Mammoth Cave—near Doneraile in north County Cork. Excavations undertaken mainly between 1904 and 1918 produced more than 2,000 animal bones, later supplemented by radiocarbon programmes and renewed investigation. Geological Survey Ireland describes Castlepook as Ireland's richest known site for vertebrate fauna in the period before the Last Glacial Maximum. Individual dated bones span a very long interval, approximately 45,700–19,950 years before present. That range is a warning as well as an opportunity: the cave preserves a time-depth, not a single frozen moment.

Its assemblage demonstrates that animals associated with Ice Age environments reached Ireland during the wider period. Recorded species include woolly mammoth, giant deer (*Megaloceros giganteus*), reindeer, brown bear and spotted hyaena; later cold-stage deposits include Arctic fox, wolf, mountain hare and lemmings. The giant deer is often called the “Irish elk”, but it was neither confined to Ireland nor closely related to living elk. These animals do not license a cinematic reconstruction in which every species grazes together outside Castlepook on one day. Some bones may be separated by thousands of years; carnivores, water movement and early excavation methods affected how remains accumulated. But they do establish the broad fact that, before the final ice-sheet maximum, southern Ireland could support or receive a varied cold-climate mammal fauna.

The cave itself was not necessarily a human dwelling. Spotted hyaenas were important bone accumulators, and the site's deposits were disturbed by water as well as by antiquarian excavation. Re-dating has shown that older radiocarbon determinations from southern Irish caves can require substantial revision, sometimes by thousands of radiocarbon years. Such findings make Castlepook exceptionally important for reconstructing Irish Pleistocene ecology, but they also require restraint. A bone date tells us when an animal lived or died; it does not, by itself, prove when the bone entered a chamber, which predator moved it, or whether people were present.

Were People Here?

This is the central uncertainty. A reindeer femur fragment from Castlepook has been publicised as bearing chop marks consistent with butchery by a stone tool and as dating to roughly 33,000 years ago. If that interpretation is confirmed, it would place a human incursion into Ireland in the general era addressed by this article and far earlier than the traditionally accepted evidence. It would not prove a permanent population, a village or a lasting line of descent; it could represent a short visit by a very small hunting party. The find deserves attention precisely because it is potentially transformative.

Potential is not the same as consensus. Castlepook's relevant material derives from old excavations with compromised contextual information, and recent project reporting has stressed that no stone or bone tool can yet be identified with certainty as human-made. The National Museum of Ireland likewise continues to state that no clear evidence has emerged for human presence in Ireland during the

Palaeolithic. In contrast, the more securely argued evidence for a late Upper Palaeolithic human visit is a cut-marked brown-bear kneecap from Alice and Gwendoline Cave in County Clare, calibrated to about 12,800–12,600 years ago—more than nineteen millennia later than the nominal year considered here. Responsible history must therefore distinguish a dated animal bone with a proposed human modification from demonstrated occupation.

Life Beyond the Evidence

Because no secure camp, hearth, tool assemblage, human burial or dwelling is known from Ireland around this time, there is no evidential basis for describing an Irish population's family life, language, dress, seasonal round, artistic practice or foodways. Nor can political affairs be recovered. There were no states, named peoples, rulers, treaties or frontiers in the historical sense that can be attributed to Ireland in 31,990 BCE. Conflict and diplomacy are equally invisible. It would be misleading to supply them merely because hunter-gatherer societies elsewhere in Europe possessed social networks, traditions and rivalries.

A cautious comparison can still provide context, provided it is labelled as comparison rather than Irish fact. Elsewhere in north-western Europe, Upper Palaeolithic *Homo sapiens* groups lived by flexible hunting, gathering and movement through seasonal landscapes; animal hides, wood, bone and stone were important materials. They had sophisticated cultural lives, including personal ornament and art in some regions. Yet no securely dated Irish artefacts tie Castlepook to a particular technological tradition, and no Irish cave art, structured hearth or worked stone implements of this age has been established. The culture and learning of any visitors to Ireland remain unknown, not primitive or absent by default.

Economy and trade must be treated with the same discipline. The Castlepook fauna implies ecological movement and possible predation, not exchange. If humans did reach Ireland, they may have travelled from Britain or the European mainland by routes now transformed or submerged, but neither the route, technology nor frequency of contact is demonstrated for this early period. Later evidence shows that Mesolithic settlers reached an island by sea and that movement across water was possible in prehistoric north-west Europe. That later achievement cannot simply be projected backwards by more than 20,000 years. Around 31,990 BCE, the safe conclusion is that the evidence does not yet reveal an Irish trade network or a settled maritime community.

Landscape, Change and Loss

The environmental story is more substantial than the human one. Ireland was undergoing the long climatic transition towards the Last Glacial Maximum. Periglacial processes—repeated freezing and thawing, sparse vegetation, exposed ground and severe winters—would have affected soils, slopes and watercourses. The mammal record indicates landscapes capable, at intervals, of supporting grazing and browsing animals as well as large carnivores. It does not support the image of a uniformly forested island, nor that of an unbroken desert of ice at every moment. Conditions varied by region, altitude, season and climatic oscillation; southern cave deposits offer only a partial window onto a much larger landmass.

Regional change would soon become overwhelming. As ice expanded, it eroded and buried earlier surfaces, while later sea-level rise drowned many lowland and coastal landscapes where people, if present, might once have left traces. This helps explain the contrast between Ireland's exceptionally sparse Palaeolithic record and Britain's much richer one. Glacial destruction and submerged landscapes are

important explanations, but not complete ones: scholars also point to Ireland's peripheral position and a comparatively restricted animal resource base. Absence of evidence cannot prove absence of people, but neither can it be converted into a settled Ice Age population.

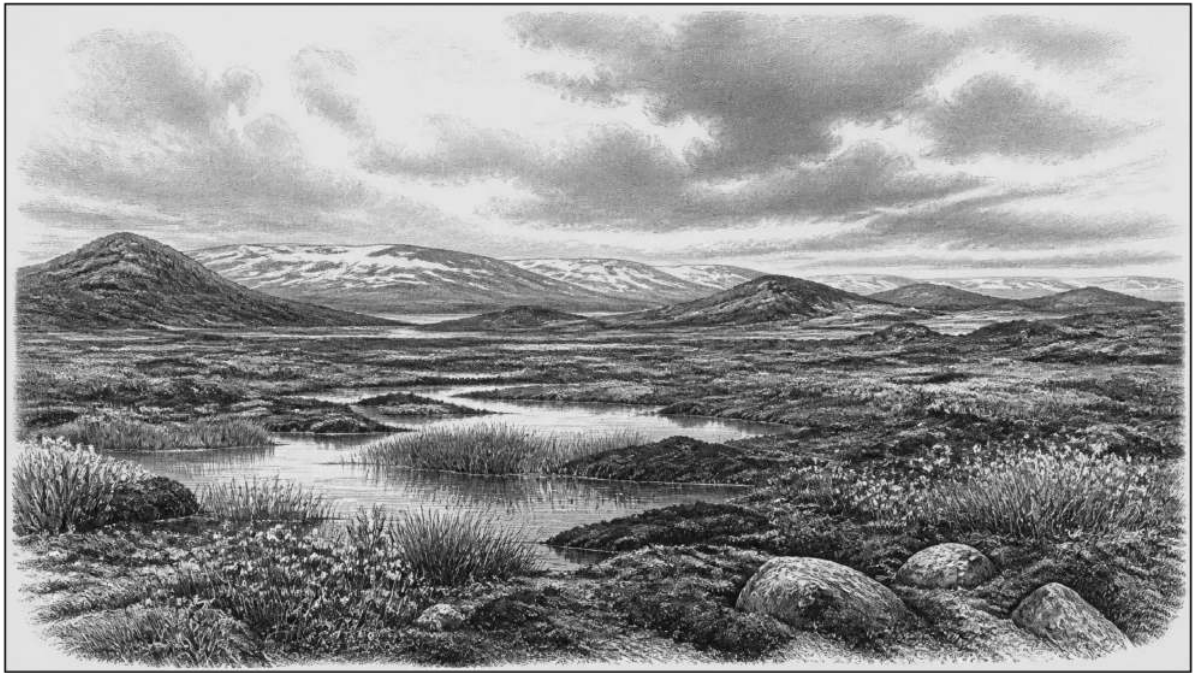
What This Year Can Mean

For Ireland, 31,990 BCE is best understood as a threshold of possibility rather than a chapter of documented human history. The land was part of a changing Ice Age world, inhabited at least intermittently by a striking fauna and approaching a period of major glaciation. Castlepook Cave preserves rare evidence of that world, especially in County Cork, while its proposed butchered reindeer bone keeps open the prospect of an early human visit. But archaeology has not yet demonstrated a community, settlement or continuous occupation at this date. The first incontrovertible large-scale colonisation belongs much later, in the Mesolithic, with Mount Sandel dated to around 9,800 calibrated years before present. The most honest account of 31,990 BCE is therefore one of deep environmental history, difficult evidence and questions still being tested.

Chapter 012 of 100

31989 BCE

Derryvree's Tundra Archive^[12]



31,989 BCE is not a date at which Ireland can be described year by year in the ordinary historical sense. It is a modern, proleptic calendar label for a point roughly 33.9 thousand years before present (where ‘present’ in radiocarbon practice is AD 1950). No calendar was in use in Ireland, no written testimony exists, and even the scientific evidence is normally resolved into ranges of centuries or millennia rather than a single year. The responsible question is therefore not ‘what happened in 31,989 BCE?’, but what the archaeological, geological and palaeoenvironmental record can say about Ireland around c. 34,000 years ago.

A Cold-Stage Ireland

This point falls within Marine Isotope Stage 3, during the wider Late Pleistocene cold stage conventionally called the Midlandian in Ireland and the Late Devensian in Britain. It preceded the fullest expansion of the last British–Irish Ice Sheet, but it belongs to the long climatic deterioration from which that ice sheet grew. Recent reconstructions show that the build-up, maximum extent and retreat of ice across Ireland and Britain were highly asynchronous: different sectors advanced and retreated at different times. The greatest ice volume in the most recent reconstruction occurred around 23,000 years ago, while some sectors had advanced earlier. That pattern is a warning against imagining a single, uniform moment when all of Ireland suddenly vanished beneath ice.

For c. 34 ka, the best evidence points to a landscape in transition rather than a securely mapped island-wide ice cover. In north-central Ireland, organic sediments beneath later glacial deposits at Greenagho, County Fermanagh, have been interpreted as showing ice-free conditions until at least about 34 ka. At Derryvree, also in Fermanagh, freshwater silts lying between tills produced a radiocarbon

determination whose calibrated range is approximately 36.9–31.7 cal ka BP. These ranges overlap the modern label 31,989 BCE, but they do not identify conditions in that exact year, nor can they be applied uncritically to every part of the island.

What the Ground Records

The Derryvree deposit is especially important because it preserves a rare environmental archive from an interval later buried and protected by glacial sediment. Its pollen, plant remains and mosses indicate open, treeless tundra or muskeg: wet ground with pools and sedge- and grass-dominated vegetation, rather than the dense woods commonly associated with modern Ireland. Such evidence describes a local environment near the site, not a photographic panorama of the whole country. Nevertheless, it strongly supports an Ireland in which cold, exposed ground and seasonal extremes shaped life across at least parts of the north-western margin of Europe.

Glacial deposits are themselves historical evidence. Tills, streamlined bedforms, moraines, erratic boulders and meltwater sediments retain the direction and behaviour of ancient ice. Geological Survey Ireland mapping records subglacial lineations, moraines and ice-marginal landforms across the island; these are the eventual products of ice movement, deposition and retreat, not monuments made by people. The familiar drumlins, eskers and many glacially modified valleys of Ireland owe their broad form to repeated Quaternary glaciations, though the precise contribution of each episode remains an active subject of research.

The crucial distinction is chronological. The ice sheet that later reached far onto the continental shelf west and south-west of Ireland achieved its fullest late-glacial extension chiefly between about 28 and 24 cal ka BP in those marine sectors. Offshore cores, submarine ridges and dated glacial sediments have transformed understanding of that advance. Around 33.9 ka BP, by contrast, the Irish ice mass was still developing, and evidence from Fermanagh indicates that at least some inland terrain had not yet been overwhelmed. The eventual ice-sheet maximum must not be projected wholesale back onto 31,989 BCE.

Plants, Animals and Uncertainty

The cold-stage landscape was not necessarily a featureless desert. Pollen and macrofossils from Irish deposits indicate herbs, grasses, sedges, mosses and low-growing plants adapted to open ground and wet, periglacial conditions. Sparse vegetation could sustain grazing and browsing animals where snow cover, soils and season permitted. Yet vegetation varied sharply with drainage, altitude, exposure and proximity to ice. It is safer to speak of patchy tundra-like and wetland environments than of one uniform ‘mammoth steppe’ extending across the entire island.

Caves and other fossil deposits add a second, more fragmentary record. Material associated with the Irish Quaternary Fauna Project indicates that large mammals including mammoth, reindeer, giant deer, brown bear and spotted hyaena occurred in Ireland during portions of Marine Isotope Stage 3. Some mammal remains from Castlepook Cave in County Cork have been assigned broadly to c. 34–35 ka. These finds establish that Ireland could form part of wider north-west European animal ranges during suitable cold-stage intervals. They do not prove that every listed species stood together at Castlepook—or anywhere else—on the calendar year 31,989 BCE. Fossil assemblages reflect preservation, transport, predation and dating limits as well as living communities.

Sea level was much lower globally than it is today because vast quantities of water were held in land ice. The continental shelves around Ireland were consequently more extensive, but the configuration of coast, marine channels, glacier fronts and exposed ground altered through time. Ireland's position at Europe's north-western edge mattered greatly: climatic shifts, ice flow through the Irish Sea basin and changing marine barriers determined which plants and animals could arrive, survive or disappear. This was regional change on a geological scale, not a stable national landscape with fixed shorelines.

No Demonstrable Human Community

There is no credible evidence for a human settlement, camp, tool-making site, burial or occupation surface in Ireland at c. 34 ka BP. This absence is particularly significant because anatomically modern humans were present elsewhere in Europe in the Upper Palaeolithic. It should not be turned into a claim that humans were incapable of entering Ireland; rather, the present archaeological record does not demonstrate that they did. An object found at Mell, near Drogheda, is an old flint flake, but the National Museum of Ireland explains that it was fashioned elsewhere and transported into Ireland by ice, not evidence for a Palaeolithic Irish settlement.

Accordingly, there were no evidenced Irish political affairs, leaders, alliances, diplomatic encounters or wars to narrate for this date. Nor is there evidence for households, villages, hunting parties, ritual places, languages, teaching traditions, trade networks or an economy within Ireland. These are not subjects hidden in an unwritten indigenous chronicle awaiting recovery: for this particular period they lack the material traces required to support historical reconstruction. A responsible account must leave those categories blank rather than fill them with generic Ice Age people.

This does not make the period irrelevant to Irish history. The absence of a known human population is itself part of the island's long history, and the physical processes underway were laying down the terrain, sediments, routes and ecological constraints encountered by people much later. Ireland's first substantial and securely recognised archaeological record belongs to the Mesolithic, thousands of years after the final retreat of the last ice sheets. The National Museum places the earliest Stone Age material in its collections in the Mesolithic, around 7000–4000 BCE, while the Heritage Council describes the earliest known settlement evidence as beginning about 8000 BCE.

Landscape Before Settlement

For people living far to the south and east, Ireland around c. 34 ka was part of the broader environmental geography of Upper Palaeolithic Europe: a cold Atlantic-edge region whose accessibility and habitability shifted with climate. But direct relevance is not direct evidence. The stone industries, art, clothing, social systems and belief worlds of continental Upper Palaeolithic communities cannot simply be transferred across the sea to Ireland. Without Irish artefacts in secure context, interpretations must remain comparative possibilities, not Irish facts.

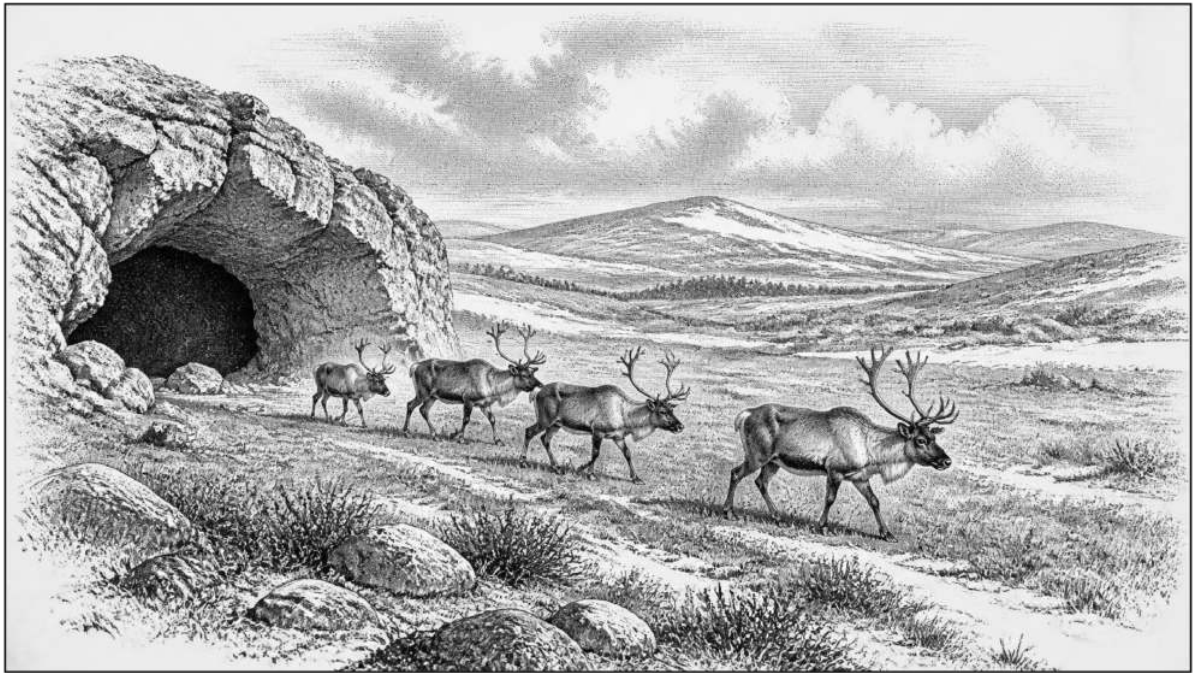
What can be said with confidence is that the island's later cultural history would unfold upon a profoundly altered physical foundation. Ice erosion and deposition reshaped drainage, left thick sediments in many lowlands and prepared landforms that later influenced soils, lakes, wetlands and travel. When the ice ultimately withdrew, plants and animals recolonised in constrained sequences, and only much later did human communities establish the camps, tools and domestic traces from which conventional Irish prehistory begins.

Thus 31,989 BCE is best understood as an environmental rather than a human historical horizon: Ireland was cold, locally open and treeless in the best-documented areas, with ice expansion looming but not yet demonstrably at its island-wide maximum. The evidence is strongest in a handful of sedimentary archives, cave deposits, landforms and offshore cores. It allows a cautious picture of climate, terrain and animal possibility. It does not allow named inhabitants, events or institutions—and recognising that limit is the most accurate way to place this remote date in Ireland's past.

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31988 BCE

Castlepook Reindeer Evidence^[13]



“31,988 BCE” is a modern chronological label, not a year that anyone living in prehistoric Ireland could have named or recorded. At this depth of time, archaeological dating cannot responsibly isolate a single calendar year. The useful frame is the later part of Marine Isotope Stage 3, before the Last Glacial Maximum, approximately 34,000 calendar years before 1950 in broad terms. Radiocarbon results must be calibrated and are expressed as ranges with margins of uncertainty; their conversion into BCE dates is necessarily approximate. What can be said about Ireland around this point is therefore a reconstruction from cave bones, geological deposits, dating programmes and regional ice-sheet models—not a narrative of a documented year.

An Island on the Edge of a Colder World

Ireland lay in a changing Ice Age landscape. The great British–Irish Ice Sheet had not yet reached its fullest later extent, but ice was building in northern and upland regions, and conditions were becoming increasingly severe. Modern reconstructions stress that the precise limits of ice around 31,000 years ago remain uncertain because direct dates are sparse. They nevertheless indicate expanding ice in parts of the British and Irish region, with substantial regional variation rather than one simple, unchanging blanket of ice. The Last Glacial Maximum came later, broadly between about 26,000 and 19,000 years ago, when much or all of Ireland was likely glaciated.

That distinction matters. Around the nominal date represented by 31,988 BCE, at least some Irish landscapes could sustain cold-adapted animals. Ireland was not the green, wooded island familiar today. The most responsible picture is of a largely open, cold environment, probably a shifting mosaic of grassland, herbs, low shrubs, exposed ground and locally icy terrain. This is an inference from the animals

represented in the fossil record, not a detailed map of vegetation for every valley. There is no surviving contemporary Irish pollen sequence that permits a precise reconstruction of weather, plant cover or seasonality for this particular calendar label.

The coastline was also unlike the modern one. Global sea level was lower because enormous quantities of water were locked in continental ice sheets, while ice and changing sea levels reshaped the surrounding shelves. Yet lower seas do not licence an easy claim that Ireland was simply joined to Britain by a continuous land bridge at this moment. The geography of crossings, coastal plains, channels and ice margins changed repeatedly, and the surviving evidence does not reveal how any individual animal—or possible human visitor—reached the island. The appropriate conclusion is mobility across a difficult north-west European world, not a confidently drawn migration route.

Castlepook Cave and a Fragile Clue

The most important evidence directly relevant to this era comes from Castlepook Cave, near Doneraile in north County Cork. The cave system is renowned for Pleistocene animal remains recovered in antiquarian and early twentieth-century excavations. Those investigations amassed an exceptionally valuable collection, but they did not meet present archaeological standards of recording. Bones were recovered from complex cave deposits, and some material may have been displaced, mixed or contaminated by later activity. That makes each specimen valuable, but also demands caution. Subsequent excavations and renewed dating have sought to identify surviving, more securely stratified deposits.

A reindeer femur from the Castlepook material has become central to discussion of an Irish Palaeolithic. It has been reported as dating to around 33,000 years ago and carries a mark interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone tool during butchery. County Cork's heritage publication presents this as approximately 31,000 BC and identifies it as possible evidence of Stone Age hunters handling reindeer. It is an arresting possibility, because it would push evidence for human activity in Ireland far earlier than the well-known post-glacial settlements.

But a responsible account must separate evidence from interpretation. The dated bone and the observed modification are evidence. The conclusion that the mark proves deliberate human butchery is an expert interpretation, albeit a significant one. No securely associated stone tool, hearth, dwelling floor, human bone, camp deposit or burial of the same age has yet been recovered in Ireland. Nor can one bone establish a permanent population, a named cultural tradition, or a continuous ancestry connecting any visitors of this period to later Irish communities. The claim is best understood as promising evidence for a very early human presence or visit, still requiring corroboration from controlled excavation and additional finds.

Animals of the Cold Landscape

Even if the reindeer mark were ultimately reassessed, Castlepook remains vital evidence for Ice Age Ireland because of its fauna. The cave assemblage includes remains attributed to reindeer, woolly mammoth, giant deer or “Irish elk” (*Megaloceros giganteus*), brown bear, mountain hare, Arctic fox, wolf, spotted hyaena and lemmings. Not all these animals need have occupied the cave's surroundings at exactly the same time: a cave can receive bones over long periods, and carnivores can carry carcass parts into dens. Yet the wider pattern demonstrates that Ireland supported a richer Pleistocene mammal

community than its modern fauna suggests. Re-dating work has shown that some southern Irish cave remains are substantially older than early radiocarbon determinations implied, placing important elements of this fauna within Marine Isotope Stage 3.

Reindeer are particularly informative. Their presence fits an open, cold landscape and would have offered a concentrated, seasonally mobile source of meat, fat, hide, sinew, bone and antler to any people able to exploit them. Mammoth and giant deer testify to large-herbivore habitats, while hyaenas and wolves signal formidable scavengers and predators. A cave containing their bones should not be imagined as a human house by default. It may have been a carnivore den, a natural trap, a place where water and sediment accumulated, or all of these at different times. The cave is evidence for an ecosystem first; evidence for people is presently much narrower.

This ecological setting places practical limits on what can be claimed about everyday life. If people were present, they were almost certainly highly mobile foragers, dependent on knowledge of animal movements, weather, stone resources and safe shelter. That is a plausible inference from Upper Palaeolithic lifeways elsewhere in Europe and from the putative butchery mark; it is not something demonstrated by an Irish settlement site. There is no evidence at this date for farming, domestic livestock, pottery, metalworking, permanent villages or field systems. There is also no basis for estimating population size. A small party making a short visit and a recurring seasonal camp would leave very different archaeological signatures, but neither has yet been identified securely in Ireland.

No Politics, No Recorded Conflict

Political history cannot be written for Ireland at this date. There were no known kingdoms, chiefs, borders, treaties, clans, written laws or diplomatic institutions. We should not replace this absence with romantic labels such as “tribes” or presume that a few travellers controlled territory in a modern sense. If humans reached Ireland, their social relationships, languages, kin networks and decisions about movement are unknown. The evidence does not tell us whether they came alone, in family groups, as seasonal hunters, or as part of wider contacts around the Irish Sea.

Likewise, there is no Irish evidence for warfare, organised conflict or diplomacy around 31,988 BCE. Animal bones with carnivore damage and humanly modified bone must not be turned into stories of violent encounters. The hazards that can be documented are environmental: cold, shifting ice margins, exposed terrain, scarce shelter and dangerous large animals. In such conditions, cooperation may reasonably be expected of any human group, but that remains a general anthropological inference rather than a fact recovered from an Irish site.

Culture Beyond the Evidence

Upper Palaeolithic communities elsewhere in Europe made sophisticated stone and bone tools, ornaments and art. None of that allows us to assign comparable objects, beliefs or artistic traditions to Ireland at this date. Ireland has no securely dated cave art, ritual site, portable art object, musical instrument, human burial or learning tradition from around 34,000 years ago. There is therefore no evidence for a particular religion or ceremonial practice. Caves can later acquire powerful cultural meanings, but Castlepook’s Pleistocene use cannot be described as sacred simply because it is a cave.

Nor is there evidence for trade in the later prehistoric sense. The possible visitors may have carried stone tools or travelled with materials from elsewhere, but no tool assemblage has been found from which sources or exchange routes can be traced. The best phrase is connectivity, not trade: any human presence

would imply that Ireland formed part of a wider network of movement across north-western Europe during a temporary window before worsening glacial conditions. That proposition awaits material proof in the form of tools, sourceable raw materials or well-dated campsites.

A Record Shaped by Loss

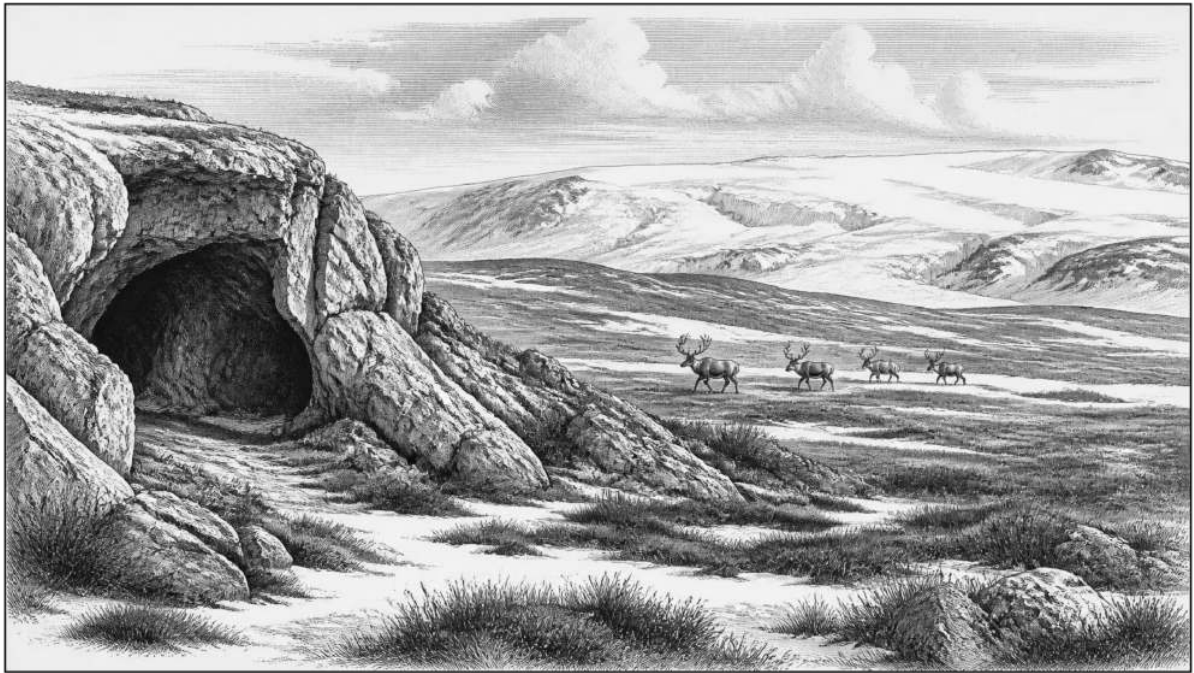
The thinness of the evidence is not proof that nothing happened. Later ice advance eroded landscapes, redeposited sediments and probably destroyed or buried many open-air traces. Rising seas after the Ice Age also drowned former coastal zones where people and animals may have travelled. Caves are unusual survivors, preserving bones in protected settings but often complicating their history through animal activity, water movement and early excavation. The contrast between the rich faunal record and the near-absence of artefacts is itself a warning: archaeology preserves some activities far more readily than others.

By the time Ireland was again occupied more visibly after the ice retreated, the evidence would be dramatically different: Mesolithic communities left lithic scatters, camps and increasingly recognisable traces from roughly the early Holocene. That later record should not be projected backwards. The National Museum of Ireland still appropriately describes the Palaeolithic evidence as unclear, while recent research has reopened the question through cave-bone analysis. The productive historical position is neither dismissal nor certainty. Around 31,988 BCE, Ireland can be seen as an Ice Age environment inhabited by cold-adapted mammals and possibly visited by people; whether it held an enduring human population remains unknown.

Chapter 014 of 100

31987 BCE

Castlepook's Cut-Marked Femur^[14]



“31,987 BCE” is a modern numerical label, not a date that anyone in prehistoric Ireland could have recognised, and it cannot identify a particular season, generation or event. Converted arithmetically, it lies about 33,936 years before AD 1950, the conventional reference point for “before present” (BP). At this depth in time, responsible chronology is expressed in broad calibrated ranges, not calendar-year precision. The appropriate setting is the later part of Marine Isotope Stage 3, within the Upper Palaeolithic and the last glacial cycle. The evidence does not permit an Irish annal for this year; it permits a carefully qualified reconstruction of a changing Ice Age landscape.

A Landscape Before Full Glaciation

Ireland was not yet the familiar green, wooded island. Ice sheets had repeatedly remodelled its terrain during the Quaternary, but the timing and extent of the final great advance varied by region and remains an active field of research. Cosmogenic exposure evidence from northern and central uplands indicates that some ground was ice-free until at least about 34,000 years ago. Larger reconstructions of the British–Irish Ice Sheet show substantial growth after about 31,000 BP, with maximum volume and extent coming later, during the Last Glacial Maximum. Thus, around the notional date of 31,987 BCE, parts of Ireland may have stood in a cold, exposed zone before the island was overwhelmed or encircled by expanding ice. It would be wrong, however, to turn that broad finding into a precise map for one year.

The climate was colder, drier and more variable than today. Vegetation would have been largely open rather than forested: a mosaic of grasses, sedges, herbs, dwarf shrubs and patches of more sheltered vegetation, shaped by wind, frost and short growing seasons. Bare rock, thin soils, braided streams and periglacial ground would have been familiar features in many districts. Limestone caves in the south and

west offered protected cavities in which bones, sediments and later visitors could accumulate. They are consequently among the most important, but also most difficult, archives for this period. Their contents are rarely a neat snapshot: water, animals, frost, excavation and later disturbance may mix materials of very different ages.

What the Animal Bones Show

The strongest direct evidence for Ice Age Ireland at roughly this scale of time is palaeontological rather than archaeological. Castlepook Cave, near Doneraile in north County Cork, is exceptionally significant because it has yielded one of Ireland's richest Pleistocene vertebrate assemblages. Its recorded fauna includes woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. These animals do not prove that every species shared the landscape at exactly the same moment; old excavations recovered remains from complex cave deposits, and later redating has shown that some earlier radiocarbon results were too young. But together they demonstrate that Ireland supported, at different points in the last glacial cycle, a cold-adapted and often large-bodied fauna far removed from the island's modern animal communities.

This evidence gives the period its real drama. Reindeer imply open country suitable for mobile grazers; mammoth and giant deer evoke extensive grazing landscapes rather than closed woodland; predators and scavengers such as wolf, bear and hyaena indicate a food web capable of sustaining large carnivores. Yet the attractive phrase "mammoth steppe" should be used cautiously in an Irish context. The fossil record is patchy, individual deposits can be mixed, and the island lay at Europe's north-western edge, where changing sea levels, ice margins and climate could sharply restrict or redirect movement. Absence of a species from the surviving Irish record is not necessarily proof that it never arrived, while presence in a cave does not show a permanent local population.

The Human Question

No securely dated settlement, hearth, dwelling, tool assemblage or human burial lets us describe a community living in Ireland in 31,987 BCE. The National Museum of Ireland consequently continues to characterise Palaeolithic human presence as unproven in the conventional archaeological record. Its famous Mell flint flake, found near Drogheda, is an artefact made elsewhere and transported in glacial deposits; it cannot testify to a Palaeolithic camp in Ireland. The first abundant and securely interpretable evidence for lasting settlement belongs much later, to Mesolithic hunter-gatherers after the final retreat of the ice, conventionally from around 8000–7000 BCE.

There is nevertheless an important, unresolved possibility. A reindeer femur from Castlepook Cave has been publicly reported as bearing chop marks consistent with stone-tool butchery and as dating to roughly 33,000 years ago. If that interpretation and chronology are sustained through full specialist publication and contextual study, it would indicate a remarkably early human visit to Ireland during the Upper Palaeolithic. It would not demonstrate a settled population. A cut-marked bone can record a brief hunting or carcass-processing episode by a very small party, while a cave collection assembled in antiquarian excavations cannot by itself reveal how long people stayed, where they camped, or whether they returned. The distinction between evidence and inference is crucial here.

For comparison, the better-established Late Upper Palaeolithic evidence comes from Alice and Gwendoline Cave in County Clare. There, a brown-bear patella bearing cut marks was independently dated to approximately 12,810–12,590 calibrated BP. Even that find represents a fleeting human trace, not

a village. Recent excavation and dating have also demonstrated how cave sediments may be brought in by runoff and slope movement, reinforcing the need for restraint when reading any isolated bone as a record of human activity. The possibility of earlier visitors is historically important, but it remains very different from proof that Ireland was continuously occupied before the Last Glacial Maximum.

No Kingdoms, No Recorded Conflict

There were no Irish kingdoms, chiefs, treaties, named peoples or political boundaries that can responsibly be assigned to this time. There is no evidence for organised warfare, diplomacy, religion, formal learning, artistic traditions or trade networks within Ireland around this notional year. Nor should later Gaelic origin stories, medieval place traditions or the great prehistoric monuments be projected backwards into an Ice Age tens of millennia earlier. Newgrange, Tara, the Céide Fields and Ireland's megalithic cemeteries belong to radically later farming societies. Their fame can obscure the fact that the deep Palaeolithic past is principally a history of land, climate, animals and sparse traces.

If humans did reach Ireland during this interval, their social world can only be inferred from wider Upper Palaeolithic Europe, not recovered directly from Irish sites. They would have depended on detailed seasonal knowledge, portable clothing and equipment, fire, cooperation and the ability to move through hazardous terrain. Such capacities are reasonable generalisations about Upper Palaeolithic hunter-gatherers; they are not evidence that a particular camp existed at Castlepook or anywhere else in Ireland in 31,987 BCE. Similarly, possible crossings from Britain or continental Europe must not be imagined as a simple journey across a permanent dry "land bridge". Lower sea levels exposed areas now beneath the Irish Sea, but ice, water, coastlines and viable routes changed repeatedly.

Environment as Historical Force

The major development relevant to Ireland was environmental instability. Ice-sheet growth would soon alter drainage, erode older land surfaces, redistribute sediment and remove or bury much evidence of any earlier animal or human activity. This destructive history partly explains why Ireland's Palaeolithic record is so slight compared with that of parts of Britain and mainland Europe. Archaeology therefore works alongside glacial geomorphology, cave taphonomy, faunal identification, radiocarbon dating and cosmogenic exposure dating. Each method answers a different question, and their results are often ranges rather than points. A date on a bone records the death of that animal; it does not automatically date the sediment around it, much less a human action inferred from a mark.

Regional variation matters especially. Southern limestone districts such as Cork preserve caves and fossil deposits, whereas areas later scoured by ice may have lost fragile deposits altogether. Mountain summits and peripheral zones may preserve clues to whether ice overtopped them, while offshore sediments record the movement of marine-terminating glaciers. Modern Ireland's eskers, drumlins, U-shaped valleys and many basin landscapes are legacies of these glacial processes, though many formed or were reshaped later than the date considered here. The country's physical geography was not merely scenery for prehistoric life: it controlled which animals could enter, which habitats persisted, and where any people could travel or survive.

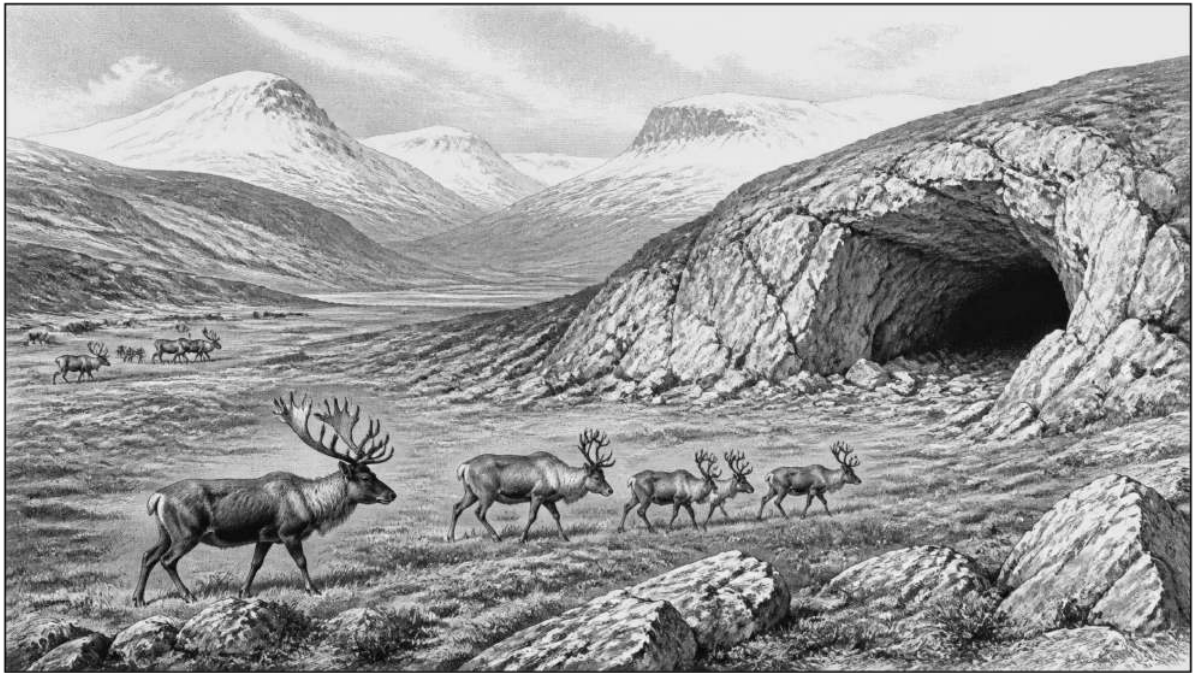
For Ireland around 31,987 BCE, then, the honest history is deliberately modest. We can place the island within a late Ice Age world and identify a cold, changing environment inhabited at some stage by striking Pleistocene fauna. We can recognise Castlepook Cave as a key archive and acknowledge a tantalising but still limited suggestion of early human butchery. We cannot name inhabitants, narrate a

battle, reconstruct a belief system or claim an enduring settlement. The significance of this period lies precisely in that threshold: before the later ice advance transformed the island, Ireland was a northern frontier whose deep past survives in fragmentary bones, caves and the geological imprint of ice.

Chapter 015 of 100

31986 BCE

Castlepook's Mammoth Fauna ^[15]



31,986 BCE cannot be treated as a date in the ordinary historical sense. No written record, settlement layer, ruler, battle or ceremony can be assigned to that calendar year in Ireland. The number is a modern backward-counting convention, not a date used by Ice Age people. In archaeological terms it equates only approximately to 33.9 thousand years before AD 1950 (c. 33.9 ka BP). Even this translation must be handled cautiously: the evidence is dated in calibrated ranges, with margins of error, and cannot resolve a single year. The responsible subject is therefore Ireland during the later part of Marine Isotope Stage 3, before the fullest expansion of the last British–Irish Ice Sheet.

At this point, Ireland was in a world of sharp climatic instability. It lay far from the mild, wooded island familiar today and close to the advancing northern ice masses of the last glacial cycle. Yet it was not simply a featureless land buried permanently beneath ice. Geological, cave and fossil evidence indicates that conditions varied greatly between regions and through time. The principal historical fact of this moment is uncertainty: Ireland was entering a profound environmental transformation whose later ice sheets would erase, disturb or bury much of the evidence that might once have recorded animals and people.

Dating an Undatable Year

The phrase “around 31,986 BCE” should be read as a broad chronological marker, not as an anniversary. Archaeologists normally employ radiocarbon years, calibrated calendar ranges, uranium-series dates and other scientific chronologies. Their time-scales have different reference points and uncertainties. The conversion to a numbered BCE year may be useful for a year-by-year series, but it creates an illusion of precision that the record cannot sustain.

For Ireland, the relevant framework is the Late Pleistocene, conventionally called the Midlandian glaciation in much Irish literature and broadly equivalent to the Late Devensian terminology used elsewhere in Britain and Ireland. The later Last Glacial Maximum is generally placed much later, roughly 26–20 ka BP in global terms, while Irish and offshore reconstructions show complex advances and retreats rather than one simple moment when every part of the island froze. At c. 34 ka BP, Ireland was in the long prelude to that maximum: glaciers and ice caps were developing, but the extent, timing and thickness of ice differed across the island and remain subjects of research.

An Island in Environmental Transition

The best evidence suggests that substantial areas of Ireland remained capable of supporting terrestrial life around this broad period. In north-central Ireland, organic sediments beneath later tills at Derryvree and Greenagho in County Fermanagh indicate ice-free conditions until at least about 34 ka BP. In the south-west, uranium-series dating of speleothems from Crag Cave, County Kerry, records phases of calcite growth between roughly 38–34 ka and again around 32–30 ka. Because stalagmites need infiltrating water and a cave system not overridden by glacier ice, they provide important evidence that southern Ireland was not continuously sealed beneath an ice sheet during these intervals.

That conclusion does not license a detailed weather report for 31,986 BCE. A cave record from Kerry cannot describe every valley, coast or upland, nor can it prove that any particular day was mild. What it does support is a more nuanced picture than an all-ice Ireland. There were periods and places with unfrozen ground, seasonal water circulation and animal habitat. At the same time, climate in the North Atlantic was liable to abrupt shifts. A cold, open and windy landscape, with sparse plant cover in exposed districts and more sheltered refuges elsewhere, is a reasonable broad interpretation; continuous forest, farmland or a settled rural landscape is not.

The geographical map was also unlike the modern one. Global sea level was lower because immense quantities of water were locked in continental ice sheets. The Irish Sea basin and Atlantic shelf had different coastlines, while connections between Ireland, Britain and continental Europe were shaped by changing sea level, channels, ice and local topography. It is unsafe to imagine a simple permanent land bridge by which people or herds could stroll from the continent to Ireland. Rather, accessibility changed through time, and any crossings would have depended upon real, local conditions that are still being reconstructed from offshore sediments and sea-floor landforms.

Caves, Bones and a Lost Fauna

The strongest direct window on Ireland near this date comes from Pleistocene animal remains, particularly in limestone caves. Castlepook Cave near Doneraile in north Cork is especially significant. Its deposits have produced evidence for a cold-stage fauna including woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, mountain hare, lemmings and spotted hyaena. Older cave collections were often excavated before modern stratigraphic standards, however, and later re-dating has shown why individual specimens cannot automatically be treated as belonging to one event or one brief phase of occupation. The cave is evidence for a changing ecosystem across a long span, not a census taken in 31,986 BCE.

Nevertheless, the fauna is historically powerful. Mammoth and reindeer indicate the potential for a productive but severe grazing environment; giant deer, *Megaloceros giganteus*, recalls that the animal commonly called the “Irish elk” was neither exclusively Irish nor an elk. Carnivores such as wolf and

spotted hyaena reveal a food web with competition, scavenging and predation. The presence of Arctic-adapted small mammals points towards cold conditions, while bears and other species show that the ecological picture cannot be reduced to one stereotyped “mammoth steppe”. Ireland’s Pleistocene fauna was diverse, but it was also less completely known than that of neighbouring Britain because later glaciation, rising seas, acidic soils and the uneven survival of cave deposits have left a fragmentary record.

These animals were not resources in an Irish economy unless humans were present to exploit them, and the evidence does not allow that assumption. They were parts of a natural economy: herbivores converting vegetation into meat and bone; predators and scavengers following carcasses; caves serving at different times as dens, traps, shelters or repositories for sediments washed in from outside. A gnawed bone, a tooth or a skull may illuminate animal behaviour and local conditions, but it does not by itself establish a human camp.

The Human Question

There is no securely documented permanent human settlement in Ireland that can responsibly be assigned to c. 33.9 ka BP. There are no known houses, hearths, tool-making floors, graves, artworks, named communities or surviving political institutions from this date. Accordingly, there can be no evidence-based account of Irish government, diplomacy, warfare, social rank, religion, learning, trade routes or everyday domestic life in the usual historical sense. To invent any would turn silence into false history.

This does not mean that human presence is impossible. Anatomically modern humans were living in parts of western Europe during the Upper Palaeolithic, and the mammals preserved in Irish caves demonstrate that Ireland could at times offer prey and shelter within a wider north-west European world. But a viable visit, a repeated seasonal presence and an enduring population are different propositions. The archaeological record requires securely dated humanly made artefacts or unambiguous modifications in reliable context before any of them can be claimed.

The distinction matters because Irish Palaeolithic research is developing. The dated butchered brown-bear bone from Alice and Gwendoline Cave in County Clare provides evidence of human activity in the terminal Pleistocene, far later than the period considered here. Meanwhile, reassessment of Castlepook and other cave collections continues to refine the dating and identification of fauna. Such work may alter the future picture, but it does not presently justify writing a settled human story for 31,986 BCE. The later Mesolithic hunter-gatherers, who left much clearer evidence after the final deglaciation, must not be projected backwards into this earlier and radically different landscape.

No Politics, but Regional Change

Political affairs are therefore absent not because they were peaceful, but because there is no demonstrable human polity in Ireland to which the term can be applied. Conflict and diplomacy cannot be recovered. Nor can religion or formal culture be inferred from caves merely because caves later acquired ritual and symbolic importance. The cultural history of this date is chiefly geological and ecological: ice was accumulating across the wider British–Irish region, sea and land boundaries were changing, and animal communities were moving, contracting or disappearing as habitats altered.

Recent large-scale reconstruction of the British–Irish Ice Sheet depicts rapid growth after about 31 ka BP, with expanding ice centres in Ireland and Scotland and increasingly marine-terminating margins. Other site-specific evidence shows that some Irish regions remained ice-free into the broad c. 34 ka interval. These findings are not mutually useless; they demonstrate why a national generalisation must be cautious. Ice-sheet growth was dynamic, asynchronous and regional. Around the requested date, southern Irish cave evidence and northern Irish organic deposits illuminate survivable landscapes, while the wider reconstruction signals the approach of ice conditions that would soon become much more extensive.

What This Moment Means

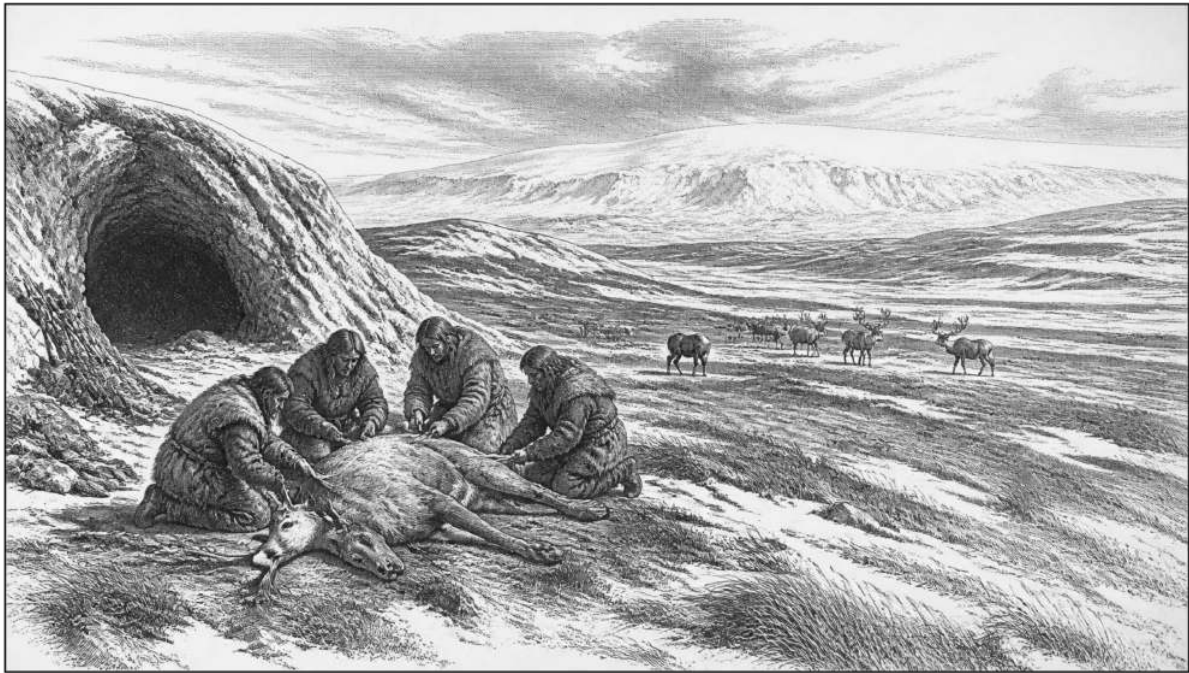
The history of Ireland around 31,986 BCE is thus not a tale of kings, monuments or tribes. It is the history of a land on the threshold of major glaciation, inhabited certainly by Ice Age animals during the broader period and possibly visited by people, but without evidence for an enduring human community. The most responsible image is not an imagined village but a changing cold-world environment: limestone caves collecting bones and mineral deposits; grazing animals moving through exposed country; predators using the same landscapes; snowfields and growing glaciers in the wider uplands and seas.

Its long-term importance is immense. The expansion and retreat of the last ice sheet reshaped drainage, soils and landforms, influenced the survival of older deposits and helped determine the ecological obstacles faced by later colonists. When humans did establish themselves in post-glacial Ireland, they entered a country whose physical setting had been remade by the processes already under way in this remote, unresolvable “year”.

Chapter 016 of 100

31985 BCE

Butchery Marks at Castlepook^[16]



A Date Beyond Calendars

31,985 BCE is a useful modern label, not a date that people in prehistoric Ireland could have recognised. No Irish written chronology, ruler list or event record exists for this remote point in time. Archaeologists instead work with imperfect scientific dates: radiocarbon years, calibrated calendar-year ranges, sediment sequences and the changing record of ice. The assigned year lies roughly 34,000 years before the 1950 ‘present’ used in radiocarbon convention, within the later part of Marine Isotope Stage 3, a fluctuating phase of the last Ice Age. It cannot responsibly be narrowed to a particular season, generation or occurrence.

The best way to approach Ireland at this point is therefore through a broad window of several millennia, especially about 45,000–30,000 years ago. This was the Middle Devensian, often called the Midlandian in Ireland: a cold world, but not one that was uniformly frozen or environmentally unchanged. Temperatures, ice extent, sea level, vegetation and animal ranges all altered abruptly and repeatedly. What is known comes chiefly from caves, animal bones, glacial landforms, offshore sediments and modern reassessment of older collections.

An Unstable Ice-Age Island

Ireland’s familiar shape and coastlines did not define the landscape. Global sea levels were lower than today because much water was locked in northern ice sheets, exposing parts of the continental shelf. Yet a low sea was not automatically a simple land bridge. The Irish Sea basin, local sea level, glaciers and changing shorelines created barriers and possible routes that varied through time. Research on Irish

palaeogeography cautions against imagining a permanent walkable connection with Britain. Any movement by animals or people would have depended on conditions that cannot be reconstructed year by year.

Nor should the island be pictured as either wholly ice-covered or wholly open at precisely 31,985 BCE. The British–Irish Ice Sheet was growing during the wider period around 31,000–30,000 years ago, but the exact timing and thickness of ice differed markedly between regions, and evidence for its early advance across Ireland is sparse. Later, at the Last Glacial Maximum, approximately 27,000–23,000 calibrated years before present, ice covered Ireland and extended across the surrounding shelf. Around the date considered here, parts of Ireland may still have provided ice-free or seasonally accessible ground, while ice masses expanded in uplands and across adjacent seas. This is a reconstructed environmental situation, not a map precise enough to locate a camp.

The eventual ice cover is central to the historical problem. Moving ice eroded landscapes, reworked sediments and destroyed or buried many traces that an earlier human presence might have left. Subsequent sea-level rise drowned other potential landscapes. The shortage of Palaeolithic sites in Ireland does not demonstrate that nobody ever came; equally, it cannot be used as evidence for a populous or continuous settlement. Survival of evidence has shaped the story.

Castlepook and a Tentative Human Trace

The most directly relevant evidence comes from Castlepook Cave, near Doneraile in north County Cork. This limestone cave complex produced an exceptional collection of Ice Age animal bone during excavations between 1904 and 1912, and further work has resumed in recent years. A reindeer femur fragment in the National Museum of Ireland’s natural-history collection has been reported as bearing deep marks consistent with stone-tool butchery on fresh bone. The object has been presented as dating to about 33,000 years ago and, in a local heritage publication, approximately 31,000 BCE. It is the reason that a date such as 31,985 BCE can be meaningfully discussed in Irish prehistory.

Its importance must be matched by caution. The bone is not an excavated hearth, a house floor, a stone-tool assemblage or a burial. Castlepook’s deposits were investigated using early twentieth-century methods, and bones were recovered from complicated cave sediments affected by water, carnivores and later disturbance. Much of the collection lacks the secure, fine-grained context expected of a modern excavation. The published reassessment of southern Irish Marine Isotope Stage 3 fauna also shows why renewed radiocarbon measurement and careful identification matter: some older results have required revision.

If the modification is correctly identified as human-made, the reindeer bone establishes a brief episode of human activity in Ireland during the Upper Palaeolithic, far earlier than the island’s previously secure late-glacial evidence. It does not establish a permanent community in Cork, an uninterrupted population, or a particular named cultural group. A reasonable interpretation is that mobile hunter-gatherers encountered and butchered a reindeer, perhaps during a short visit. Even that episode may not have occurred inside the cave: carnivores could have carried discarded or scavenged remains into their den. The evidence is powerful precisely because it is so rare, but it remains a single line of evidence requiring corroboration from securely excavated material.

A Fauna of Cold Open Country

Castlepook nevertheless makes clear that Ireland could support a striking Ice Age fauna during parts of Marine Isotope Stage 3. Mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena are among animals represented in the cave collection. Shandon Cave in County Waterford has also yielded cold-stage faunal material, including horse in association with mammoth and reindeer. These finds point towards landscapes that, at favourable times, included open, cold grassland, herb-rich tundra or steppe-tundra rather than the later wooded island often associated with Irish prehistory.

Yet the animal list should not be turned into a single tableau. Cave assemblages can accumulate over long periods, and a predator's prey remains need not represent animals living together in one season. Redating has indicated that some species in southern Irish caves belonged to substantially different episodes within MIS 3; giant deer and spotted hyaena may have disappeared locally before about 40,000 calibrated years ago. Thus mammoth, hyaena and reindeer demonstrate the breadth of the regional faunal record, but they do not prove that every species was present beside Castlepook in 31,985 BCE.

The cold-country animals do, however, help explain why a human visit is conceivable. Reindeer move in herds and can be a major, predictable resource for hunter-gatherers: meat, marrow, hide, sinew, antler and bone were valuable materials. In continental north-west Europe, Upper Palaeolithic groups used sophisticated stone technologies and often followed seasonal resources across large territories. It is plausible that people reaching Ireland belonged to such wider networks. It is not possible to assign them an ethnicity, language, religion, artistic tradition or political identity from one modified bone.

Society Without Institutions

There is no evidence at this date for Irish chiefs, kingdoms, diplomatic agreements, organised warfare, farms, villages or monuments. Those categories belong to much later periods. If people entered Ireland around this time, their social world was likely composed of small, highly mobile kin groups whose survival rested on knowledge of animal behaviour, weather, raw materials and safe routes. Such a statement is an inference from Upper Palaeolithic hunter-gatherer lifeways elsewhere in Europe, not a direct observation of a Cork camp.

Everyday life, if there was a human presence, would have been constrained by cold, exposure and mobility. Clothing and shelter made from skins, wood and other perishable materials could leave little trace, especially after glaciation. Fire, stone tools and butchered bones are the forms of evidence archaeologists would hope to find. No securely associated toolkit has yet been recovered in Ireland for the possible Castlepook episode. The absence makes claims about hunting weapons, cooking, domestic arrangements or seasonal residence premature.

Culture, Belief and Knowledge

The Upper Palaeolithic elsewhere in Europe produced cave art, engraved bone and antler, personal ornaments, music and elaborate treatment of animal materials. Those achievements show the intellectual capacities of contemporary *Homo sapiens*, but none can presently be attributed to Ireland in 31,985 BCE.

No cave art, ornament, ceremonial deposit or human burial of this age is securely known from the island. It would be misleading to populate Irish caves with paintings or rituals simply because such practices are known abroad.

That silence is historically meaningful. It tells us less about whether transient visitors had beliefs than about the small and damaged archaeological sample. Caves preserve bone better than most Irish soils, but they also mix materials through water flow, animal activity and excavation history. The distinction between evidence and interpretation is especially important here: an animal bone bearing possible butchery marks is evidence for an encounter; a story of a settled Ice Age people is not.

After the Window Closed

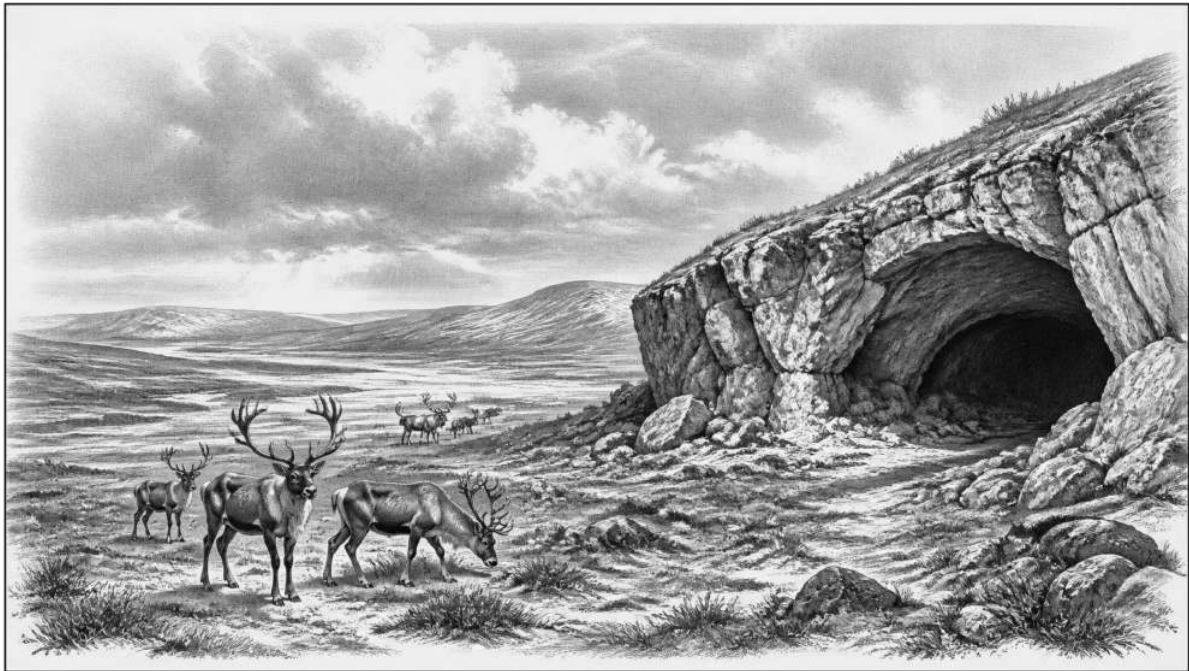
Whatever happened during this warmer or less severely glaciated interval did not create an easily traceable ancestral population. The advancing ice sheet transformed Ireland, and later deglaciation reshaped its surface once more. Definitive evidence for human activity becomes much clearer only near the end of the Pleistocene, including the cut-marked brown-bear bone from Alice and Gwendoline Cave in County Clare, dated to approximately 12,810–12,590 calibrated years before present. More substantial settlement evidence belongs to the Mesolithic, after the ice had retreated.

For 31,985 BCE, then, Ireland should be understood as a changing north-western edge of Ice Age Europe: inhabited confidently by cold-adapted animals, affected by an expanding ice sheet, and perhaps visited by a very small number of hunter-gatherers. Castlepook offers an arresting possibility rather than a complete origin story. Future excavation, refined dating, microscopic study of bone surfaces and investigation of submerged landscapes may strengthen, alter or overturn elements of that interpretation. At present, intellectual honesty requires leaving much of the scene open.

Chapter 017 of 100

31984 BCE

Castlepook Reindeer Cut Mark^[17]



31,984 BCE is not a date at which Ireland can be assigned a recorded event. It is a modern calendar label imposed on a period for which neither written testimony nor year-by-year archaeology exists. At such depth in time, even very good radiocarbon measurements normally produce calibrated probability ranges rather than a single historical year. The responsible question is therefore not what happened in Ireland in this particular year, but what the archaeological, faunal and glacial evidence can reveal about the island at approximately 34,000 calibrated years before present.

A Landscape Before the Great Advance

This was the Late Pleistocene, within the last glacial cycle, and close to the beginning of the major growth phase of the British–Irish Ice Sheet. It was not yet the Last Glacial Maximum, the period of most extensive late Ice Age ice cover, generally placed much later, around 26,000–20,000 years ago. Reconstructions of the ice sheet show that expansion was regionally uneven: ice masses grew, merged and advanced at different times across Ireland, Britain and the surrounding shelf. Evidence from southern Ireland also indicates that some ground in north-central Ireland had remained ice-free until at least about 34,000 years ago, before the later build-up of the Irish ice sheet.

That distinction matters. It would be misleading to picture all of Ireland in 31,984 BCE as a single, uniform white wilderness buried beneath an ice cap. Equally, it would be wrong to imagine a hospitable green island. The climate was cold, variable and increasingly severe on a scale far beyond later historical experience. Open habitats dominated wherever ice had not overwhelmed the terrain: a patchwork broadly comparable to steppe-tundra, with grasses, sedges, herbs, low shrubs and exposed mineral ground rather than closed woodland. Wind, frost, seasonal snow, sparse vegetation and unstable ground would have shaped both animal movement and any human journey.

Sea levels were much lower globally because vast volumes of water were stored in northern ice sheets, and the outlines of coasts and shelves differed greatly from those of today. Yet lower sea level does not demonstrate a straightforward walkable route into Ireland. The changing Irish Sea, ice margins, shallow basins and crustal movement make the palaeogeography complicated. Scholarship has long challenged simple claims of a durable Ireland–Britain land bridge. For this earlier Ice Age phase, the route by which animals—and, if present, people—reached the island remains unresolved. They may have moved across exposed or ice-bound terrain during particular conditions, but the evidence does not permit certainty.

Castlepook and a Fragile Human Trace

The most important evidence relevant to this date comes from Castlepook Cave near Doneraile in north County Cork. Antiquarian excavations there between the late nineteenth and early twentieth centuries recovered a very large assemblage of animal bones, though much contextual information and many finds were lost by modern standards. Renewed study by the Irish Quaternary Fauna Project and later researchers has used improved identification and radiocarbon pretreatment to reassess surviving material. The revised dates established that parts of the Castlepook fauna belong to Marine Isotope Stage 3, the middle portion of the last glacial cycle, rather than only to its final stages.

Among the finds is a reindeer femur reported as bearing a deep cut mark consistent with the use of a sharp stone tool in butchery. It has been presented as dating to roughly 33,000 years ago—approximately the early thirty-second millennium BCE in conventional calendar terms, rather than an exact equivalent of 31,984 BCE. County Cork heritage publications identify it as Ireland’s earliest potential evidence of human activity. If the mark is correctly interpreted, it demonstrates that people reached the island during the Ice Age, more than 20,000 years before the previously accepted Late Upper Palaeolithic evidence from County Clare.

Its importance should not conceal its limits. The bone is an isolated find from an old cave collection, not a stone-tool assemblage recovered in a sealed occupation floor. No hearth, dwelling, human bone, securely associated weapon point or recognisable camp has yet been found in Ireland for this period. Nor does the reindeer bone prove permanent settlement. The animal could have been killed or processed elsewhere; its remains may subsequently have been dragged into the cave by scavengers. Castlepook’s bone accumulations include carnivores and evidence of their activity. The most careful conclusion is that the find offers a serious, potentially transformative indication of short-lived human presence, but not a basis for describing a settled Irish population.

The Animal World

Even without assuming people were present, Castlepook supplies vivid evidence for the ecological world around this broad date range. Its pre-Last Glacial Maximum fauna includes reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, stoat, collared lemming, Norwegian lemming and spotted hyena. Not every species need have lived there at the same moment, and radiocarbon ranges must be considered individually. Nevertheless, the assemblage shows that southern Ireland supported, at intervals during Marine Isotope Stage 3, a strikingly diverse cold-climate mammal community.

Reindeer are particularly significant. Their presence implies grazing country and seasonal mobility, not a featureless ice desert. Mammoth and giant deer point towards open forage-rich landscapes, while lemmings and Arctic fox indicate cold conditions. Hyenas complicate any simple hunting narrative: caves were often dens, shelters and places where carnivores accumulated prey remains. A reindeer bone within a cave therefore tells archaeologists several possible stories—natural death, scavenging, predator transport or human butchery—before microscopic examination of surface damage and dating can narrow the possibilities.

Brown-bear remains add another layer to the evidence. Genetic studies show that Late Pleistocene Irish brown bears had a remarkable history of admixture with polar bears. That discovery is important for Ice Age population history, but it cannot be used to reconstruct daily life in 31,984 BCE. It demonstrates long-term biological connections across north-west Europe, not an encounter witnessed by a particular community. Later modelling suggests that brown bears were very unlikely to have survived continuously in Ireland through the much harsher Last Glacial Maximum; populations probably disappeared and recolonised after the ice retreated.

People, If They Came

If hunter-gatherers did visit Ireland at this time, they belonged to the Upper Palaeolithic world of north-western Europe. Across neighbouring regions, *Homo sapiens* communities used carefully made stone tools, managed fire, processed animal carcasses and travelled through large territories in response to season, prey and raw materials. But there is no securely diagnostic Irish lithic assemblage that permits an archaeological culture—Aurignacian, Gravettian or another label—to be attached to the Castlepook evidence. Applying one of those names to Ireland would turn continental comparison into unsupported identification.

The likely scale of any presence is likewise unknown. A small hunting party could leave almost no durable trace, particularly in a landscape subsequently reshaped by advancing ice, erosion, rivers and sea-level change. Later glaciation was capable of stripping, transporting and burying sediments on a vast scale. This helps explain why Ireland's Palaeolithic record is exceptionally sparse compared with Britain and continental Europe. Absence of camps cannot prove absence of people, but neither can one modified bone establish repeated occupation, family life or a lasting population.

There is no evidence for political institutions, territorial states, diplomacy, warfare, named leaders, formal religion, monuments, farming, pottery, textile production, metalworking or long-distance trade networks within Ireland at this date. Those are not missing chapters awaiting recovery from written sources; they are questions beyond what the evidence can responsibly answer. Any visitors were mobile foragers, not farmers, and their economy—if the Castlepook interpretation is accepted—would have centred on acquiring and processing wild animals and perhaps other seasonally available resources.

Caves, Knowledge and Memory

Caves such as Castlepook are crucial archives, but they should not automatically be treated as homes or sacred places. They can preserve bones because sheltered limestone chambers protect material that open ground would lose. They may also collect animals carried in by predators, water or people over thousands of years. The cave's scientific value lies partly in this complexity: modern archaeology combines zooarchaeology, taphonomy, radiocarbon dating, sediment study, spatial recording and cave survey to separate the histories mixed within it.

At this time there is no direct Irish evidence for cave art, personal ornaments, ritual practice or teaching traditions. It is reasonable to infer that any *Homo sapiens* visitors possessed social knowledge, language and learned survival skills comparable in broad capacity to contemporary people elsewhere in Europe. It is not reasonable to infer the content of their beliefs, language or artistic life in Ireland. The evidence supports a possible moment of human action on a reindeer carcass; it does not preserve the stories people may have told about it.

An Island Rewritten by Ice

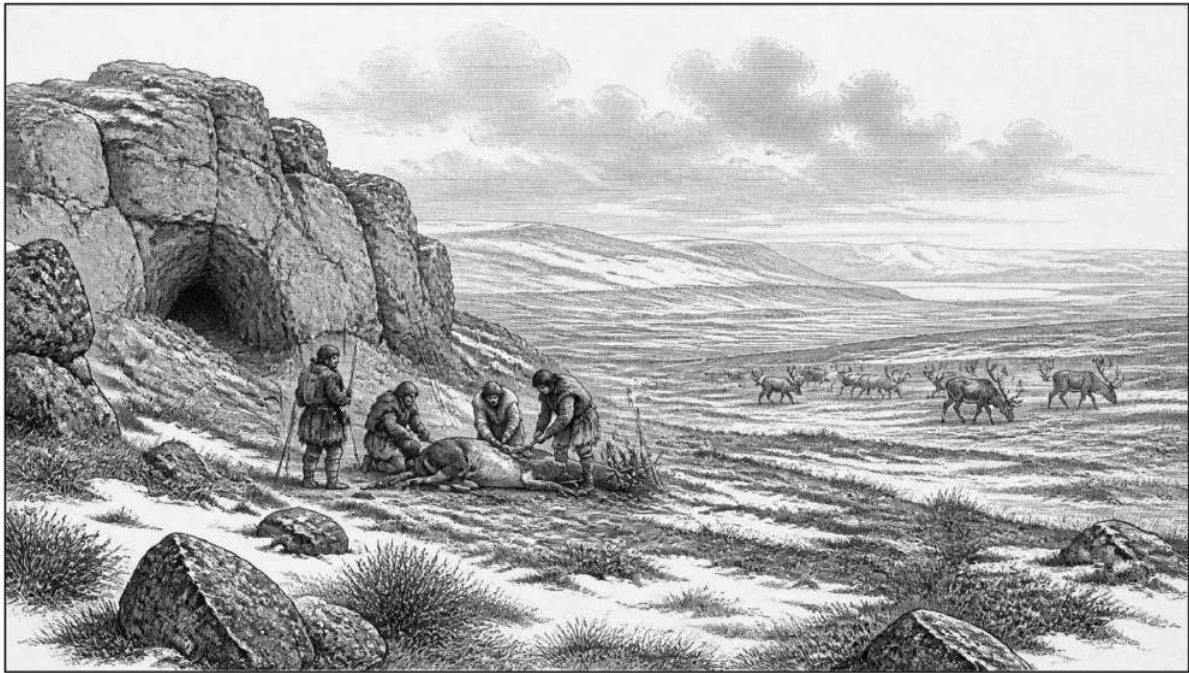
The chief historical development illuminated by 31,984 BCE is therefore environmental, with a tantalising human possibility embedded within it. Ireland was entering the long transformation that would culminate in widespread glaciation. Animal communities that had occupied open cold landscapes would be disrupted, and any human use of the island was unlikely to be continuous across the later ice maximum. Much later, after deglaciation, reindeer, giant deer and bears reappeared in changing combinations, while the first substantial archaeological record of people in Ireland belongs to Mesolithic hunter-gatherers after about 10,000 years ago.

Castlepook has altered the terms of debate. Ireland can no longer be discussed simply as a land first visited after the Ice Age without acknowledging the possibility of far earlier Palaeolithic incursions. Yet the correct picture remains one of uncertainty, not a newly populated prehistoric nation. Around 31,984 BCE, the island was a cold, dynamic and ecologically rich edge of north-west Europe. A marked reindeer bone may preserve the faintest evidence that people briefly shared that landscape with mammoth, hyena and reindeer before the advancing ice erased almost everything else.

Chapter 018 of 100

31983 BCE

Ice-Age Threshold ^[18]



A Date Without a Year

“31,983 BCE” is a useful modern label, not a date that people or landscapes in prehistoric Ireland could have recognised. At so great a distance, archaeology cannot identify a particular season, event or community in one named calendar year. The label corresponds only approximately to about 34,000 years before AD 1950, the conventional reference point used in radiocarbon work; it must not be treated as a precisely calibrated archaeological timestamp. The responsible scale is therefore a broad one: later Marine Isotope Stage 3, within the Last Glacial Period, and several millennia before the climatic nadir conventionally called the Last Glacial Maximum. The available evidence is uneven, mostly environmental or animal-bone evidence, and comes chiefly from caves in southern Ireland rather than from settlements.

This uncertainty matters. Ireland has no excavated village, graveyard, tool-making floor or monument securely dated to this notional year. There are no names, rulers, polities, religious rites, treaties or battles. Indeed, there is no evidence for a permanent human population. What can be investigated is the physical Ireland through which animals moved, the changing climatic setting, and one unusually important but limited clue that people may have reached the island intermittently: a reindeer bone from Castlepook Cave in north County Cork reported to bear fresh-bone cuts consistent with stone-tool butchery.

Before the Glacial Maximum

Ireland at roughly this time was not yet the uniformly ice-covered island of the later Last Glacial Maximum. Reconstructions differ in local detail, especially over high ground and the south-west, but they agree that the major ice-sheet maximum lay later, broadly between about 26,500 and 19,000 years ago. Studies of the Irish Ice Sheet show both the scale of later glaciation and the complexity of its growth, with some uplands possibly retaining cold-based ice or standing above erosive ice at different moments. It would therefore be misleading to picture 31,983 BCE simply as an endless white ice cap, yet equally misleading to imagine a modern green Ireland.

Instead, the best-supported picture is of a cold, unstable Ice-Age environment. During milder intervals of Marine Isotope Stage 3, open grassland, herb-rich steppe-tundra, patches of scrub and exposed ground could support large grazing animals. Conditions changed repeatedly over centuries and millennia, and a cave collection cannot produce a single island-wide weather report. The word “landscape” should also be used cautiously: later glaciers eroded, transported and redeposited vast quantities of material, so much of the terrain visible today is the outcome of ice advances after this period. Drumlins, eskers, glacially scoured valleys and widespread tills are legacies principally of those later stages.

Castlepook’s Fragmentary Record

The strongest directly relevant archive is Castlepook Cave near Doneraile, County Cork. Excavations undertaken in the early twentieth century recovered a very large mixed collection of animal remains from the limestone cave system. Much material was lost, and the original digging methods did not meet modern archaeological standards of recording. This is crucial: individual bones can now be directly dated, identified and examined microscopically, but the collection does not represent a carefully excavated, intact occupation layer. Bones of different ages, animals and depositional histories may have been brought together in the same cave passages.

Even with that limitation, Castlepook demonstrates that Ice-Age Ireland supported a markedly different fauna. The cave’s dated and identified assemblage includes reindeer, giant deer, woolly mammoth, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Some of these animals may have used caves; others were probably dragged in as carcasses or fragments by carnivores and scavengers. Earlier observers noted the predominance of reindeer remains and interpreted the cave as a place where predators consumed prey. It is evidence for an ecological community, rather than proof that every listed species encountered one another on the same day or occupied every region of Ireland simultaneously.

Modern redating has sharpened, but also complicated, the chronology. A 2020 reassessment found that some older Irish cave radiocarbon determinations had underestimated the age of the bones, in part because techniques for cleaning and pretreating bone samples have improved. The revised results place some Castlepook fauna firmly in Marine Isotope Stage 3 and suggest that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum. Such findings make a cold, animal-rich southern Irish landscape plausible around the broad timeframe represented by 31,983 BCE, but they do not date a whole cave deposit—or a human visit—to one exact calendar year.

A Possible Human Visit

The most consequential human clue is a reindeer femur from Castlepook. It has been described by zooarchaeologist Ruth Carden as carrying marks made when fresh bone was cut or chopped with a stone tool, and the animal's death has been reported as approximately 33,000 years ago, or around 30,000 BCE in broad historical language. If that diagnosis is upheld, it is evidence that people processed reindeer in Ireland tens of millennia earlier than the island's long-established Mesolithic settlement record. It is not, however, evidence for a town, a tribe with a known territory, or continuous habitation.

The distinction between presence and settlement is central. No associated hearth, worked-flint assemblage, dwelling, human burial or securely defined living surface has been recovered from Castlepook for this period. The bone alone cannot tell us whether one hunting party made a short landfall, whether a small group ranged through the region for a season, or whether such visits happened repeatedly. Nor can it identify the visitors' language, kinship system, beliefs or political organisation. Archaeological interpretation can reasonably suggest mobile hunter-gatherers taking advantage of reindeer and other large animals; it cannot responsibly fill the gap with an invented Ice-Age Irish society.

Life, Risk and Mobility

If people did butcher the reindeer, the action implies practical knowledge rather than a settled economy. A carcass offered meat, fat, hide, sinew, bone and antler—valuable materials in a cold environment. Butchery marks demonstrate processing, not necessarily hunting: people may have killed the animal, found it freshly dead, or taken it from carnivores. The surrounding faunal record gives good reason for caution. Wolves, bears and spotted hyaenas formed part of the wider ecological setting, and cave deposits themselves may record their feeding and denning behaviour. In such circumstances, a cave was not automatically a human home; it could be a dangerous animal refuge or a place where remains accumulated naturally.

There can be no meaningful account of Irish political affairs, diplomacy or warfare for this period. Those categories require evidence of enduring communities and social institutions that is absent here. Likewise, there is no Irish evidence for shrines, formal burial, visual art, writing or organised learning at this date. Across Europe, Upper Palaeolithic people created sophisticated tools, art and long-distance social networks, but those continental achievements cannot be transferred automatically to Ireland. The safe conclusion is narrower: a stone-tool-marked bone, if correctly interpreted, would show skilled human action on Irish ground, not the full cultural life of the people responsible.

Sea, Land and Connection

Lower global sea levels altered the geography of north-west Europe, exposing broad shelves now beneath the Atlantic and Irish Sea. Ireland's later isolation was important to the make-up of its post-glacial fauna, but the exact routes and connections available around 34,000 years ago remain matters of reconstruction rather than observed fact. Ice, sea level, coastlines and land corridors altered through time; a map for the later glacial maximum should not be projected unchanged onto this earlier stage. For a small party, the Irish Sea region was a formidable, shifting frontier rather than a modern national boundary.

That geography helps explain why evidence is scarce. Later ice could destroy or bury open-air sites, while rising seas submerged former coastal plains where people and animals may have travelled. Caves preserve bones exceptionally well, but often preserve them out of original context. The archaeological silence of much of Ireland therefore cannot prove that nobody ever crossed it; neither can it turn one possible butchery trace into proof of a widespread population. Research on submerged prehistoric landscapes and refined dating of cave bones are essential because both address these biases in the surviving record.

What Followed

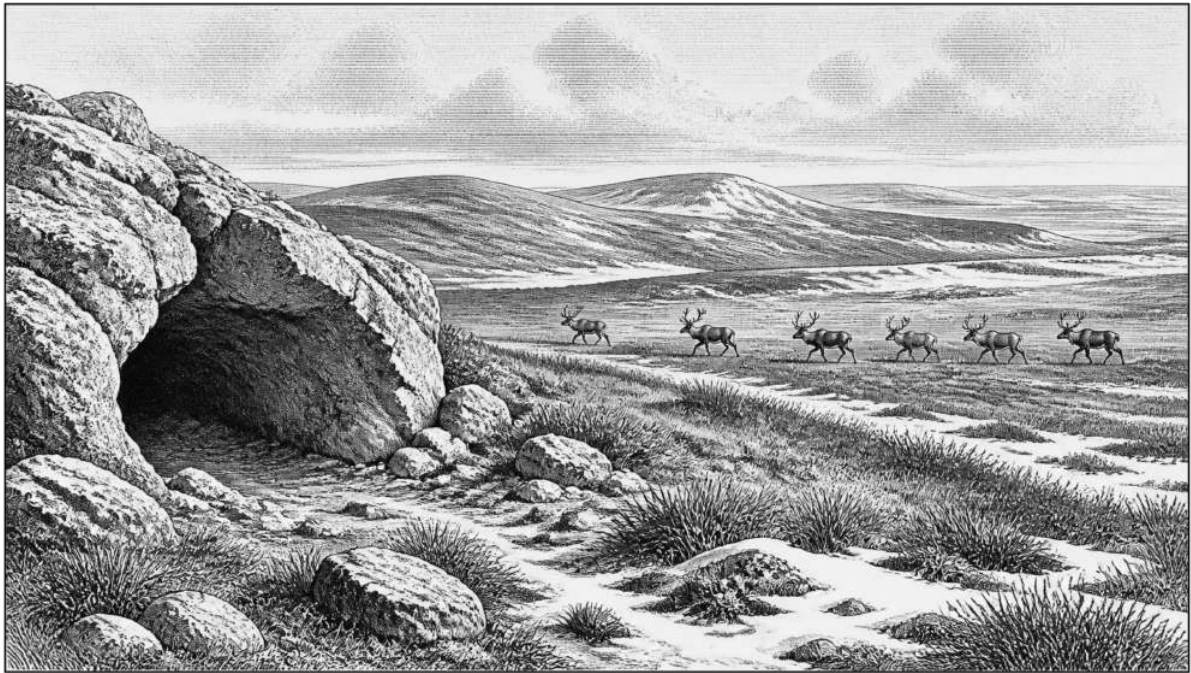
The period around 31,983 BCE did not lead straightforwardly to later Irish history. As climate deteriorated, the Last Glacial Maximum transformed the island, and later ice cover and retreat reshaped its surfaces. Plant and animal recolonisation followed deglaciation, while the first robust evidence for sustained human settlement belongs far later to the Mesolithic. At Mount Sandel on the River Bann, excavations revealed huts, hearths, pits and abundant stone tools, with occupation conventionally placed around 7900–7500 calibrated BCE. This is the point at which the archaeological record begins to support a fuller account of everyday life in Ireland.

For 31,983 BCE, then, the most important development is not a recorded Irish event but the possibility of a fleeting human encounter with an Ice-Age landscape. Castlepook Cave preserves a fragile connection between reindeer, predators, changing climate and perhaps a hunter's stone tool. It offers a compelling beginning to Ireland's human story precisely because it is so incomplete. The evidence illuminates a moment of opportunity on the north-western edge of Europe; interpretation must stop short of turning that moment into an imagined nation, settlement or calendar-year drama.

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31982 BCE

Castlepook Hyena Den^[19]



“31,982 BCE” cannot be treated as a datable year in the ordinary historical sense. There are no written records, calendar systems, named communities or securely dated events for Ireland at this depth of time. The number is best used as a modern filing point for a much wider interval: roughly 34,000 calendar years before present (where “present” in archaeological dating convention is AD 1950). Even that conversion should not imply annual precision. Radiocarbon results require calibration, have ranges rather than single answers, and are often attached to animal bone or sediment rather than to a human occupation. What can responsibly be described is Ireland in the later part of the Last Glacial Period, before the fullest expansion of the last British–Irish Ice Sheet.

A Changing Ice-Age Land

At about 34,000 years ago, Ireland lay within the unstable climate of Marine Isotope Stage 3, a long cold phase marked by abrupt swings between relatively milder and harsher conditions in the North Atlantic world. It was not yet the climatic nadir normally called the Last Glacial Maximum, generally placed later, around 26,000–19,000 calibrated years before present. Nor should Ireland at this date be pictured simply as the familiar modern island under a uniform white cap. The growth of the last British–Irish Ice Sheet was a process, varying between regions and through time; major reconstructions investigate its advance and retreat across the period from about 31,000 to 15,000 years ago.

The exact extent of ice in every Irish valley or upland at this particular point cannot be recovered. Later glaciers eroded, transported and buried older deposits, while changing sea levels altered coastlines and removed many former landscapes beneath the sea. Yet the broad direction of change is clear. Conditions were deteriorating towards the major glacial advance. Much lower sea levels exposed extensive continental-shelf terrain around Ireland and Britain; the shore was therefore far beyond many

modern coastal places. Connections across the Irish Sea region changed repeatedly as ice, land and sea interacted. It is misleading to project modern coastlines, modern vegetation or modern travel distances onto this landscape.

For people living in north-west Europe, if any reached Ireland, this was a world of great environmental risk: cold winds, seasonally severe weather, sparse plant cover and rapidly changing routes through the wider landmass. But it was not necessarily an empty or wholly frozen wilderness. The evidence suggests that Ireland supported animals during parts of the middle and later Ice Age, before glaciation became more extensive. The important question is not whether an imagined Irish society flourished in 31,982 BCE, but what the fragmentary physical record can say about habitats, animals and the possibility of brief human visits.

Castlepook and the Animal Record

The key Irish locality for this earlier Ice-Age evidence is Castlepook Cave, near Doneraile in County Cork. Geological Survey Ireland describes it as the country's richest site for vertebrate fauna from the period leading up to the Last Glacial Maximum. Excavations in the early twentieth century recovered more than 2,000 bones, and later work has shown a long sequence of animal remains spanning much of the Ice Age. Its recorded fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyena, while later Ice-Age material includes Arctic fox, wolf and lemmings.

That list is compelling, but it needs careful reading. It does not prove that every listed species stood together outside the cave in 31,982 BCE. Castle deposits can mix material introduced at different times by water, carnivores, gravity and earlier excavation. The original digging methods also left incomplete stratigraphic records. Radiocarbon determinations from Castlepook and other Irish caves have transformed understanding of the fauna, but individual dates remain subject to calibration, sample quality and reassessment. A major review of the Irish Quaternary Fauna Project concluded that a wide range of mammals reached Ireland between at least about 45,000 and 20,000 years ago, rather than documenting one unchanging Ice-Age community.

Nevertheless, Castlepook provides a defensible picture of ecological possibility. Large herbivores such as mammoth, reindeer and giant deer indicate periods when open or broken, cold-climate habitats could sustain grazing and browsing animals. Their presence would also have supported scavengers and predators. Spotted hyena is especially significant: the cave contains evidence that it was used as a carnivore den or repository, meaning many bones need not represent human hunting at all. Brown bear, wolf, foxes and small cold-adapted mammals point to a varied fauna rather than a single simple "mammoth-steppe" scene. Ireland's Ice-Age ecology was dynamic, and the fossil record is a sample of that dynamism, not a complete census.

The Human Question

There is no securely excavated settlement, hearth, tool assemblage, human skeleton or built structure that can be assigned to Ireland around 34,000 years ago. Therefore there is no basis for describing an Irish tribe, village, chiefdom, language or cultural tradition in this year. The National Museum of Ireland's public account still stresses that clear Palaeolithic evidence for humans in Ireland has not emerged, while identifying the Mell flint flake in County Louth as an artefact made elsewhere and later carried into its findspot by ice.

There is, however, a reason this question remains open. A reindeer bone from Castlepook, recovered during historic cave investigations and later reported to bear stone-tool butchery marks, has been associated in public and heritage accounts with an age of about 33,000 years ago. If the interpretation, dating and association are ultimately confirmed through full publication and contextual study, it could indicate that people reached Ireland before the Last Glacial Maximum. It would demonstrate an episode of carcass processing, not automatically a permanent population or an established settlement. Recent licensed work at Castlepook has specifically sought surviving Pleistocene deposits because the earlier excavations left major questions unresolved.

This distinction matters. A cut-marked bone can be powerful evidence of contact between people and animal, but it cannot reveal how many people were present, how long they stayed, whether they travelled seasonally, or whether they returned. Nor can an absence of tools prove that no one ever came. Later ice action, acidic soils, erosion, rising seas and the limited survival of caves all make Ireland a difficult place in which to find very early archaeology. The most responsible conclusion is that human presence around this time is possible and under investigation, but not yet demonstrated at the standard needed to write a year-specific human history.

No Politics, No Recorded Conflict

Political affairs, diplomacy and organised conflict cannot be reconstructed for Ireland in this period. There were no states, kingdoms, borders, written agreements or identifiable leaders. Even the existence of a resident human population is unproven. It would be equally unwarranted to imagine warfare over mammoth hunting grounds, alliances between groups, or a migration directed by named peoples. Such narratives belong to later prehistoric or historic Ireland, not to the evidence available for the deep Palaeolithic.

If small groups did enter the region, comparison with Upper Palaeolithic hunter-gatherers elsewhere in Europe suggests that mobility, detailed environmental knowledge, social co-operation and portable technologies would have been essential. That is a comparison, not evidence from Ireland itself. No Irish lithic industry of this age is securely known, and no Irish find permits an attribution to a named continental archaeological culture. The people who may have visited Castlepook cannot responsibly be identified as the ancestors of later Irish communities, as “Celts”, or as members of any modern population.

Daily Life, Belief and Exchange

For the same reason, everyday life can be discussed only in conditional terms. Any human visitors would have needed food, warmth, shelter and ways to move through a cold landscape, but no Irish site of this age preserves a camp floor, dwelling, clothing, ornaments, art or burial. Caves could have offered shelter or been places where animals accumulated bone, yet Castlepook’s evidence chiefly concerns fauna and geological deposits. It does not establish domestic occupation inside the cave.

There is no direct Irish evidence for religion, ritual, learning, music or visual culture at about 34,000 years ago. The sophisticated art and symbolic practices known elsewhere in Upper Palaeolithic Europe show what humans of the wider era could create, but they cannot be transferred to Ireland without finds. Likewise, there is no evidence for trade in the later sense. Any movement of people, stone, hides, meat or

knowledge would have occurred through small-scale hunter-gatherer networks across changing landscapes, not through documented commercial routes. The exposed shelf and altered geography may have made movement less maritime than today, but the practical pathways remain uncertain.

What This Date Means

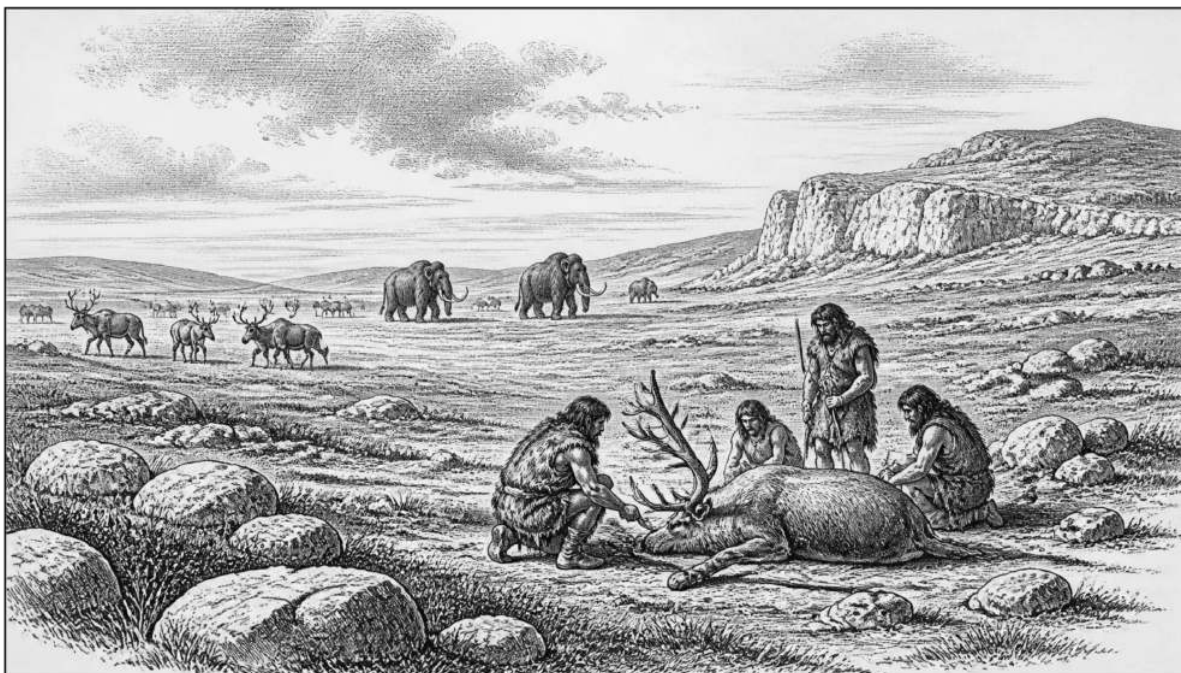
The principal development relevant to 31,982 BCE was environmental rather than political: Ireland was approaching the severe glacial conditions that would later reshape its land surface and erase much earlier evidence. Castlepook Cave preserves an unusually important window onto the animals that occupied, or intermittently entered, this changing world. Its mammal remains show that Ice-Age Ireland was not beyond life; they also show why cave taphonomy and precise dating are central to the story.

Human history at this point remains a question rather than a narrative. Later evidence is firmer: a butchered brown-bear patella from Alice and Gwendoline Cave in County Clare has calibrated ranges around 12,810–12,590 years before present, supporting a late Upper Palaeolithic human incursion, while sustained settlement is securely documented only much later in the Mesolithic. Around 31,982 BCE, then, Ireland should be understood as a cold, ecologically changing place on the edge of north-west Europe: rich enough to preserve traces of formidable animals, and perhaps briefly visited by people, but still far beyond the reach of calendar-year history.

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31981 BCE

Reindeer Butchery at Castlepook^[20]



The label 31,981 BCE is useful for filing an Irish past that has no written chronology, but it must not be mistaken for a date at which an event can be fixed to a calendar year. At this depth of time, archaeological dating normally provides ranges in radiocarbon or calibrated years before present, often with substantial margins of uncertainty. The responsible view is therefore of Ireland *around* 34,000 calendar years ago: in the Upper Palaeolithic and Late Pleistocene, before the fullest expansion of the last Irish ice sheet. There was no Ireland of kingdoms, counties, tribes with recorded names, or historical diplomacy. There may, however, have been brief human visits to a cold north-western landscape inhabited by reindeer and other Ice Age mammals.

For this period, Castlepook Cave near Doneraile in north County Cork is the indispensable site. Its cave galleries have yielded one of Ireland's richest known assemblages of Late Pleistocene animal remains, accumulated across a very long span rather than during a single occupation. Geological Survey Ireland describes material from the cave ranging broadly from about 45,700 to 19,950 years before present, including reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox and spotted hyena. That breadth is a warning as well as an opportunity: bones from several climatic episodes occur in a complex cave context, and not all were deposited by the same process.

A Date Range, Not a Dated Day

The particular modern year in this article lies close to the date assigned to a reindeer femur fragment from Castlepook Cave. Cork County Council identifies the object as Palaeolithic, circa 31,000 BC, in the Natural Museum collection, and reports a mark interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone tool during butchery. Public reporting has commonly expressed the result as evidence of people in Ireland around 33,000 years ago. Those formulations are useful headlines, but they

should not be converted into “a hunt in 31,981 BCE”. The animal bone supplies an approximate age and a possible human action; it does not date the action to a particular season, establish the number or identity of people involved, or prove continuous settlement.

The distinction matters because Castlepook is not an excavated Palaeolithic village. No securely associated stone-tool assemblage, hearth, dwelling, burial, artwork or intact occupation floor has yet been recovered there. The cave deposits were affected by carnivores, water and earlier excavation. In fact, the evidence suggests that the reindeer was probably butchered elsewhere and that parts of its carcass were subsequently dragged or scavenged into the cave by predators or scavengers. The cut-mark interpretation is important precisely because it is so slight: it may preserve the trace of a human encounter otherwise erased by time, rather than evidence for a resident community.

An Open, Cold Landscape

Around this broad period Ireland was approaching, but had not necessarily yet entered, the most extensive phase of the Last Glacial Maximum. One synthesis states that Ireland remained ice-free until roughly 32,000 calibrated years before present, whereas the global Last Glacial Maximum is conventionally placed at about 26,000–19,000 years before present. Other reconstructions show the British-Irish Ice Sheet reaching the Atlantic shelf edge west of Ireland at about 26,700 calibrated years before present, followed by major retreat and readvance. Thus 31,981 BCE belongs not to a simple image of an island wholly buried beneath ice, but to a changing pre-maximum world in which cold conditions and advancing ice profoundly shaped habitats and routes.

It was not a green, wooded Ireland. The animal record at Castlepook points instead towards open, cold-country habitats capable of supporting reindeer and, at different times, mammoth, giant deer, Arctic fox, lemmings, wolves and hyenas. These are not merely decorative “Ice Age animals”. Each species implies constraints on vegetation, temperature, prey and seasonality. Reindeer in particular evoke a mobile grazing animal adapted to open terrain. Yet the cave’s long chronology prevents a neat reconstruction of a single herd crossing a particular valley in a particular year. The safest description is a mosaic of tundra-steppe or sparse cold grassland, with patches of exposed ground, seasonal snow and an unstable climate at Europe’s Atlantic edge.

Sea level was far lower than today, so the outlines of Ireland and its coasts were different. But the exact accessibility of the island should not be oversimplified. Pleistocene sea-level change and ice margins could create or remove potential dispersal corridors; some models invoke land, ice or marine connections at different stages. Recent sedimentary ancient-DNA research from Castlepook supports substantial faunal connectivity between Ireland and Eurasia before the Last Glacial Maximum. That finding strengthens the case that large mammals could reach this north-western edge of Europe. It does not, by itself, demonstrate a permanent human route or tell us how a human party may have travelled.

The Possible Human Presence

If the modification on the reindeer bone is correctly identified, the most defensible human story is a short-lived incursion by Upper Palaeolithic hunter-gatherers. Such people would have possessed stone cutting tools and the practical knowledge required to exploit large animals. A cut or chop mark on fresh bone is consistent with disarticulating a limb, removing meat, or gaining access to marrow and tendons. It

is evidence for animal processing, not necessarily for the kill itself: hunters could have pursued, found, scavenged or shared a carcass. Nor does it permit claims for spears, bows, clothing styles, language, family structure or a camp at Castlepook, because none of these survives at the site in secure association.

Comparison with Britain and continental north-west Europe makes a mobile hunting party plausible, but comparison must remain interpretation. Upper Palaeolithic groups elsewhere organised their movements around seasonally available resources, used fire and sophisticated stone technologies, and sometimes created striking visual culture. Ireland has not produced the evidence needed to assign all of those practices to a Castlepook visit. It would be misleading to furnish the Irish scene with decorated caves, ceremonial costumes or named “first Irish” people merely because such things are known elsewhere. The reindeer bone makes Ireland relevant to the wider Upper Palaeolithic world; it does not fill its archaeological silence.

No Politics, No Recorded Conflict

Political history cannot responsibly be written for this point. There is no evidence for chiefs, territories, alliances, collective identities or diplomatic exchange in Ireland around 31,981 BCE. Nor is there evidence for armed conflict. Hunting large, alert animals in a harsh environment carried danger, and competition with wolves or hyenas for carcasses was possible, but danger is not warfare. The only conflict visible in the cave record is ecological: predators, scavengers and humans may all have sought access to animal bodies and sheltering spaces.

Likewise, there is no Irish evidence for religion, ritual, formal learning, writing, music or art at this date. Human beings elsewhere in Europe were capable of complex symbolic behaviour, but an ability demonstrated elsewhere is not an archaeological find from Ireland. The absence of evidence should not be turned into an assertion that visitors had no beliefs or culture; it defines the limits of what can be recovered. For Ireland, no shrine, burial practice, pigment, engraving or symbolic object can presently be attached to this period with confidence.

Subsistence Without an Economy of Exchange

The word “economy” is useful only in its smallest sense here: obtaining food, materials and shelter under severe environmental pressure. Reindeer venison, fat, marrow, hide, sinew and bone would all have been valuable to hunter-gatherers, but the Castlepook evidence securely indicates only that a reindeer bone was modified in a way interpreted as human butchery. There is no basis for reconstructing regular trade, exchange networks, livestock ownership, farming or maritime commerce in Ireland at this time. Agriculture, pottery and permanent field systems lay many millennia in the future.

The cave itself was probably more important as a natural trap and carnivore den than as a human home. Earlier investigators recorded abundant reindeer remains and reasoned that carcasses or limbs had been carried underground by wild animals. Modern work continues to stress the cave’s disturbed and time-depth-rich character. This makes Castlepook scientifically valuable: it records changing animal communities on the eve of the glacial maximum. It also makes cautious interpretation essential. A bone is not a settlement; a possible tool mark is not a society in miniature.

What Ireland Can Claim

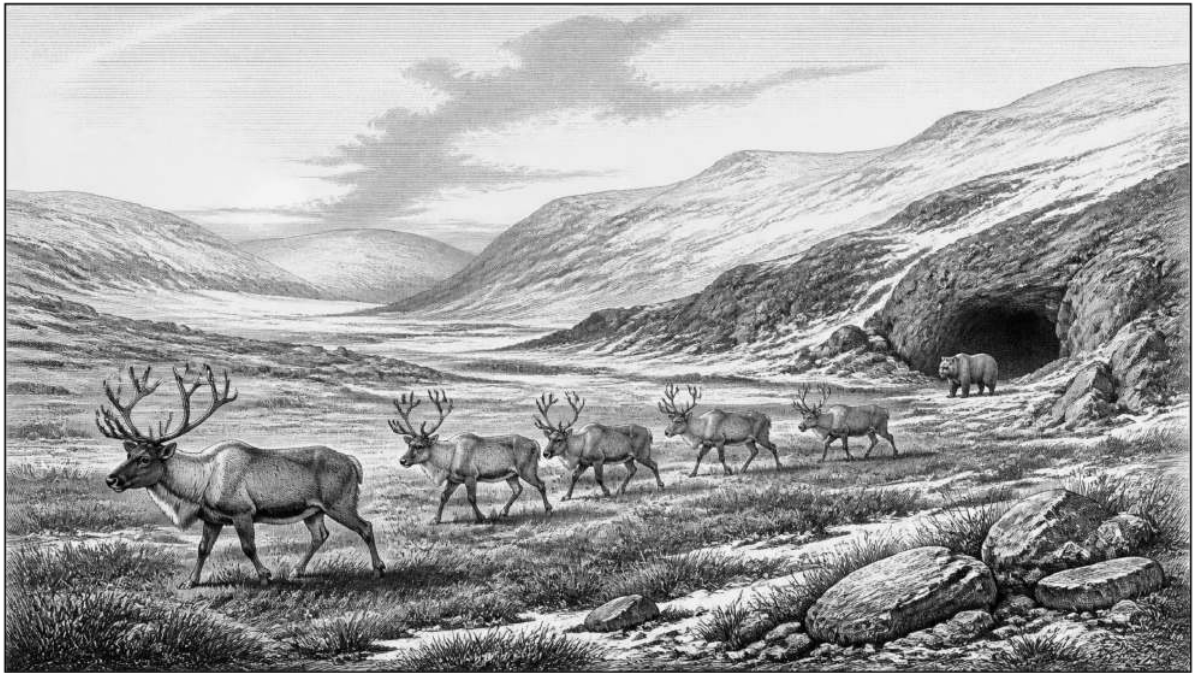
Ireland around this indexed year was a frontier environment, not an historical nation. Its enduring significance lies in the possibility that human beings reached it far earlier than the once-standard account allowed. The better-established Late Upper Palaeolithic evidence from Alice and Gwendoline Cave, County Clare, is much later, dated to about 12,810–12,590 calibrated years before present from cut marks on a brown-bear kneecap. Castlepook, if its reindeer modification withstands continued scrutiny, extends the possibility of human activity back by roughly twenty millennia, to before the Last Glacial Maximum.

That is the appropriate scale of the story. Around 31,981 BCE, Ireland offers no annual chronicle, no leader and no securely located camp. It offers a cold landscape, a remarkable cave archive, animals moving through a connected north-west European world, and one reindeer bone that may preserve a fleeting encounter between people and prey. Future excavation, dating and biomolecular work may sharpen or revise that picture. For now, the evidence supports possibility, environmental context and profound uncertainty—not invented events.

Chapter 021 of 100

31980 BCE

Shandon Cave Fauna^[21]



“31,980 BCE” is a modern chronological label, not a date that prehistoric people in Ireland could have recognised or recorded. It cannot be matched to an event, ruler, settlement or individual. At this depth of time, archaeological and environmental dating works with ranges, margins of error and calibrated radiocarbon chronologies rather than a calendar year. The responsible frame is therefore *around* 34,000 calibrated years before present (cal BP), within the later part of Marine Isotope Stage 3, well before the Last Glacial Maximum. What can be described is an Irish landscape in climatic transition, the animals documented by cave deposits, and the unresolved question of whether people ever entered the island during this earlier Ice Age phase.

A Land Before Maximum Glaciation

Ireland lay at the north-western edge of Europe during the last glacial cycle. Around this notional year, the great British–Irish Ice Sheet had not yet reached its final maximum extent. Syntheses of the ice-sheet record place its major build-up after roughly 35,000–32,000 years ago, with maximum expansion later, broadly between 27,000 and 23,000 cal BP. This does not mean that Ireland was uniformly mild, open or free of ice at 31,980 BCE. Glaciers and ice caps could advance and retreat regionally; mountains, coasts and interior lowlands had very different conditions. The evidence instead warns against imagining either a wholly frozen island or a familiar green one.

In southern Ireland, stratified evidence indicates that parts of the coast remained free of the final ice-sheet advance until after about 24,200 cal BP. Cave faunas from the south and south-east also demonstrate that terrestrial animals could occupy parts of the island during Marine Isotope Stage 3. Together, these

findings support an Ireland which included exposed ground, cold-water drainage systems, limestone caves and extensive open habitats during at least portions of this period. They do not supply a day-by-day weather record, nor do they permit a single line to be drawn around an “ice-free Ireland” for one year.

Global sea level was substantially lower than today because much water was locked in continental ice. The outlines of the Irish coast and the shallow seas around it were therefore different, with broader coastal plains in some areas. Connections and barriers between Ireland, Britain and continental Europe changed as sea level, ice margins and marine conditions changed. Animal arrivals prove that movement into Ireland occurred at some point during the broader glacial cycle, but they do not identify a simple, permanent land bridge or establish the route used by every species.

The Evidence in Irish Caves

The principal evidence for Ireland at this time is palaeontological: animal bones and teeth, usually recovered from caves, fissures and old sediment deposits. The most important sites for this early phase include Shandon Cave near Dungarvan in County Waterford and Castlepook Cave near Doneraile in County Cork. Their collections were first excavated in the nineteenth and early twentieth centuries, long before present-day standards for recording sediments, microscopic finds and stratigraphic relationships. They remain invaluable, but their limitations are central to their interpretation.

Shandon Cave produced remains attributed to brown bear, reindeer, horse, wolf and woolly mammoth. Radiocarbon programmes have placed elements of its fauna in Marine Isotope Stage 3, although individual specimens have different ages and should not automatically be treated as animals living together on a single occasion. Castlepook is especially significant for evidence of spotted hyaena, as well as remains of mammoth, giant deer, reindeer, brown bear and other cold-period animals. Improved pretreatment and redating have shown that some earlier radiocarbon determinations from Irish caves were too young. Reassessment has pushed aspects of the Castlepook fauna further back in time and suggests that some species disappeared locally before the Last Glacial Maximum, perhaps around 40,000 cal BP.

That distinction matters for 31,980 BCE. A bone date provides the age of an animal’s death within a statistical range; it is not a dated snapshot of an entire Irish ecosystem. Cave deposits may also have been accumulated by predators, water, roof collapse, later digging or the rearrangement of sediments. The most defensible conclusion is that Ice Age Ireland sustained a changing succession of large mammals and carnivores across the wider period, not that every species listed from a cave shared the same valley in the same season.

Open Country and Mobile Fauna

The faunal record nevertheless gives a vivid, if incomplete, impression of the environments available. Reindeer, wild horse and woolly mammoth are consistent with open, cold landscapes containing grasses, sedges, herbs and low shrubs rather than dense forest. Giant deer would have required productive forage, while brown bears, wolves and spotted hyaenas occupied very different places in the food web. Mountain hare, Arctic fox and lemmings recorded elsewhere in Irish Late Pleistocene contexts underline the capacity of climatic shifts to replace one animal community with another.

Such animals were not symbols of a timeless “Ice Age”; they were living populations responding to seasonality, food supply, snow cover, predation and changing access routes. Mammoth, horse and reindeer bones show that Ireland was not biologically empty. Hyena evidence at Castlepook is particularly

important because caves can be used as dens, places where scavenged or hunted carcasses accumulate, rather than merely shelters in which animals died naturally. A cave assemblage can thus preserve traces of relationships between predators and prey as well as a list of species.

Vegetation cannot be reconstructed in fine detail for this exact point from the Irish record alone. Pollen, insects, animal diets, landforms and comparable north-west European sequences point to a cold, exposed and treeless or sparsely wooded mosaic in many areas. Local shelter, south-facing slopes, wetlands and river corridors could have differed markedly from uplands swept by wind and snow. It would be wrong to picture blanket forest, modern bogland or present-day coastlines. Equally, an entirely barren white wilderness would be misleading: the documented fauna required plant productivity, freshwater and seasonally usable ground.

People: A Genuine Uncertainty

No securely dated human settlement, hearth, stone-tool assemblage or human burial is presently known from Ireland for around 34,000 cal BP. There is therefore no responsible basis for describing an Irish clan, hunting camp, language, political territory or leader in 31,980 BCE. The Late Upper Palaeolithic butchered brown-bear patella from Alice and Gwendoline Cave, County Clare, is genuine and important evidence for later human activity: two independent radiocarbon measurements place it about 12,810–12,590 cal BP, during the Younger Dryas. It cannot be used to populate Ireland more than twenty millennia earlier.

There are, however, reasons why the question remains open. Researchers reassessing Castlepook's old collections have identified bones with cut marks attributed to several phases of the last glacial cycle. The cave has been the focus of renewed excavation precisely because well-provenanced lithics, charcoal, modified bone or undisturbed sediments could test claims for an earlier Palaeolithic presence. At present, those investigations should be treated as a research programme, not as proof that people inhabited Ireland in 31,980 BCE.

This caution is strengthened by the nature of the evidence. A cut mark has to be separated from tooth damage, trampling, excavation damage and natural abrasion; the bone itself must be dated; and, ideally, it must come from a secure archaeological context alongside other evidence of human activity. A single modified specimen can demonstrate a brief visit or carcass-processing episode, but not a permanent population. The absence of recognised sites may reflect later glaciation, erosion, sea-level change and the difficulty of finding small camps, especially on now-submerged landscapes. Absence is not proof that nobody came, but it is not a licence to turn possibility into history.

No Politics, but a Human Ecological Frontier

Political affairs, diplomacy and organised warfare leave no evidence for Ireland at this date, and none should be invented. If small groups of Upper Palaeolithic people did reach the island during Marine Isotope Stage 3, their concerns would have been practical and immediate: safe passage, seasonal weather, fuel, freshwater, animal movements, shelter and the risks posed by large carnivores. Those are informed inferences from comparable European hunter-gatherer worlds, not direct observations of an Irish community.

Likewise, there is no Irish evidence from around 31,980 BCE for religion, formal learning, art, long-distance trade or enduring settlements. Cave use by hyaenas is not human ritual; animal bones are not a market; and a favourable crossing route is not evidence of regular exchange. Material culture cannot yet

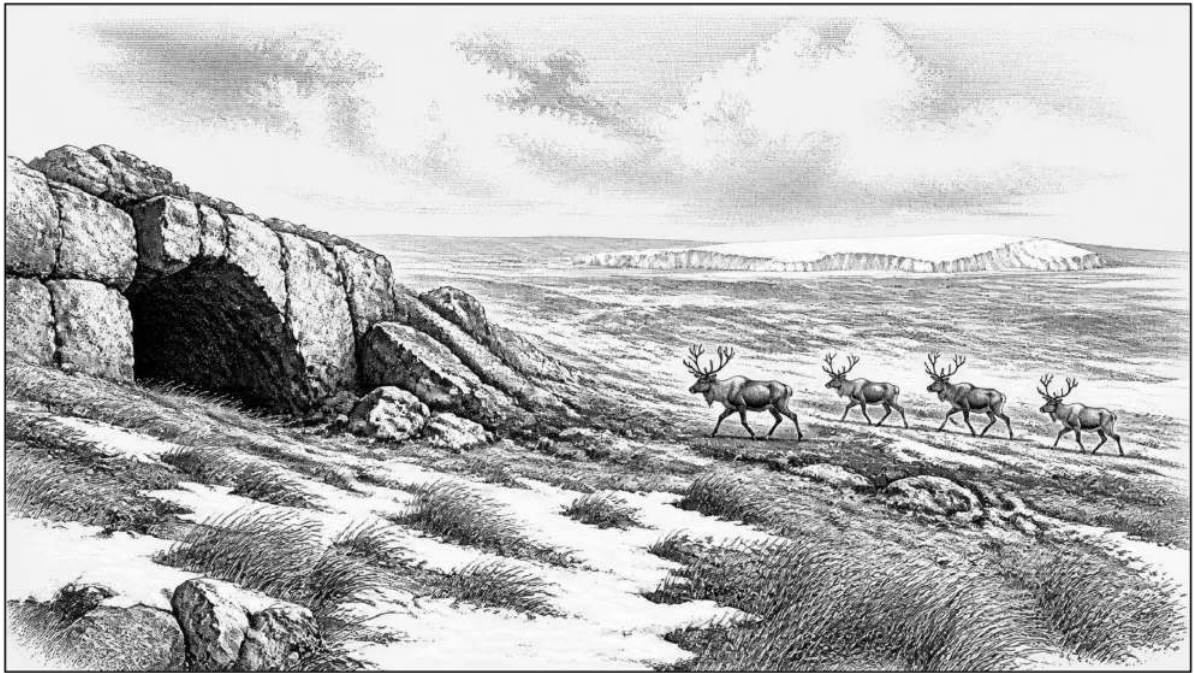
be assigned to this date in Ireland. The familiar social themes of later Irish prehistory—farming, monuments, metalworking, territorial lordship and maritime exchange—belong to immensely later worlds.

Yet this apparently silent period is historically significant. It establishes the environmental preconditions from which later Ireland emerged. Before the final glacial expansion reshaped the island, southern cave systems recorded a northern European fauna far richer in large mammals than that of historic Ireland. The advance and retreat of ice would later erase landscapes, alter coastlines and repeatedly restrict or open routes for plants, animals and people. Around 31,980 BCE, Ireland should be understood not as a nation awaiting its first history, but as a dynamic Ice Age peninsula or island-margin environment whose surviving bones, sediments and landforms still set the limits of what can honestly be said.

Chapter 022 of 100

31979 BCE

Reindeer Processing at Castlepook^[22]



The label 31,979 BCE gives a useful point on a modern timeline, but it does not identify a year that anyone in Pleistocene Ireland could have named, recorded or experienced as a discrete historical moment. Archaeology cannot resolve events in Ireland to a calendar year this far back. In radiocarbon practice, the nearest equivalent is roughly 33.9 thousand calendar years before present (cal BP, with “present” conventionally 1950), and even that is only an approximate conversion. The responsible subject is therefore Ireland during the later part of Marine Isotope Stage 3: a cold, unstable phase of the Late Pleistocene, before the fullest expansion of the last British–Irish Ice Sheet.

A Country in a Changing Ice Age

Ireland around this point was not the green, wooded island familiar from later prehistory. Nor should it simply be imagined as a single, unbroken white ice cap. The climate of the North Atlantic region changed sharply over millennia and sometimes more rapidly. Ice was growing and advancing in the wider British–Irish region, while the maximum extent of the last ice sheet came later, broadly between about 26,500 and 20,000 cal BP. Research on the continental shelf and on Irish landforms shows that the ice sheet eventually reached far beyond today’s coasts, in places to the shelf edge. At c. 33.9 ka cal BP, however, the precise extent, thickness and behaviour of ice in every Irish region remain matters of scientific reconstruction rather than direct observation.

That uncertainty is important. The later ice sheet eroded, redeposited and buried older ground surfaces, making the survival of campsites, hearths and footprints exceptionally unlikely. Much of what can be said about Ireland at this date comes instead from caves, animal bones, geological deposits, offshore sediment cores and the shapes ice left upon the land after it melted. These sources document a

changing physical world more securely than they document human lives. They also represent different moments: a bone from one cave and a moraine on the continental shelf must not automatically be treated as evidence for the same season, generation or even millennium.

Cold Landscapes and Animal Traces

The best-supported picture is of a severe northern environment in which open habitats periodically had an important place. Pleistocene cave assemblages from Ireland include animals associated with cold, open country, among them reindeer, mountain hare, lemmings and Arctic fox, as well as larger mammals such as mammoth, horse, giant deer, red deer, wolf and brown bear. Castlepook Cave near Doneraile in County Cork is especially significant because nineteenth- and early twentieth-century excavations recovered a remarkably varied Ice Age fauna. Yet the list is not a census of one living landscape. Cave deposits can accumulate over very long intervals, and bones may be moved, disturbed or reworked before excavation. The presence of a species establishes that it reached Ireland at some stage; it does not prove that every listed animal shared the same valley at 31,979 BCE.

Direct dating brings a sharper, though still incomplete, chronology. Red-deer remains from caves in County Waterford have produced calibrated pre-Last Glacial Maximum ranges of about 32,930–31,280 cal BP and 30,297–29,594 cal BP. The earlier of these sits close enough to the date considered here to demonstrate that sizeable terrestrial mammals could occupy parts of Ireland during this broad interval. Such animals required food, shelter and routes through an exact landscape that is now largely lost. The evidence does not tell us their population sizes, migrations or the extent of vegetation with precision, but it cautions against depicting all of Ireland as permanently sterile or uniformly sealed beneath ice at this earlier stage.

The Question of Human Presence

The most arresting Irish evidence is a reindeer femur from Castlepook Cave reported to bear cut marks consistent with stone-tool butchery and dated to approximately 33,000 years ago. If the marks are correctly interpreted and the dated bone is closely connected with the modification, it indicates that people processed a reindeer in Ireland during the Late Pleistocene. It is a major challenge to the once-common belief that humans first reached Ireland only after the final retreat of the ice. It may illuminate the general era around 31,979 BCE, but it must not be converted into an invented event for that particular year. The reported date is not a calendar date, and it is not an occupation layer containing a house, hearth, tool kit or human burial.

Current research therefore treats the earliest occupation question as open. Excavations at Castlepook have sought intact deposits, lithics, charcoal and further modified bone, but no securely dated settlement of this age has yet been established. Ireland has no known human skeleton from c. 33.9 ka cal BP, no securely associated camp floor and no local sequence of stone tools from which a named archaeological culture can safely be assigned. It would be tempting to call any visitors “Aurignacian” or “Gravettian”, terms used for Upper Palaeolithic material traditions elsewhere in Europe. Without diagnostic Irish artefacts, that would be an interpretation about possible connections, not a fact about Ireland.

What Everyday Life May, and May Not, Reveal

If people did visit, the cut-marked reindeer bone suggests a very limited but concrete activity: the dismembering or stripping of an animal carcass with a sharp-edged implement. It does not by itself show whether the animal was hunted, scavenged, killed nearby or carried to the cave in pieces. Nor can one bone reveal the number, age or identity of the people involved. In comparable Upper Palaeolithic contexts beyond Ireland, small mobile groups used stone, bone, skin, fire and detailed environmental knowledge to obtain food in seasonal landscapes. That wider comparison makes short visits by capable foragers plausible; it cannot supply the missing Irish evidence for dwellings, clothing, kinship, diet beyond one episode, or a permanent population.

Accordingly, political affairs, warfare, diplomacy and formal leadership cannot be reconstructed for Ireland at this date. There is no evidence for communities large enough to identify as tribes, no fortifications, no territory boundaries and no exchange network represented by imported artefacts. The lower sea levels of the Ice Age changed the geography of the Irish Sea basin, but low sea level alone does not demonstrate an easy land route between Ireland and Britain. Ice, open water, unstable coastlines and seasonal conditions all mattered. Any human crossing would have been a difficult movement through a changing north-western European world, not evidence for routine travel or trade.

Culture Beyond Recovery

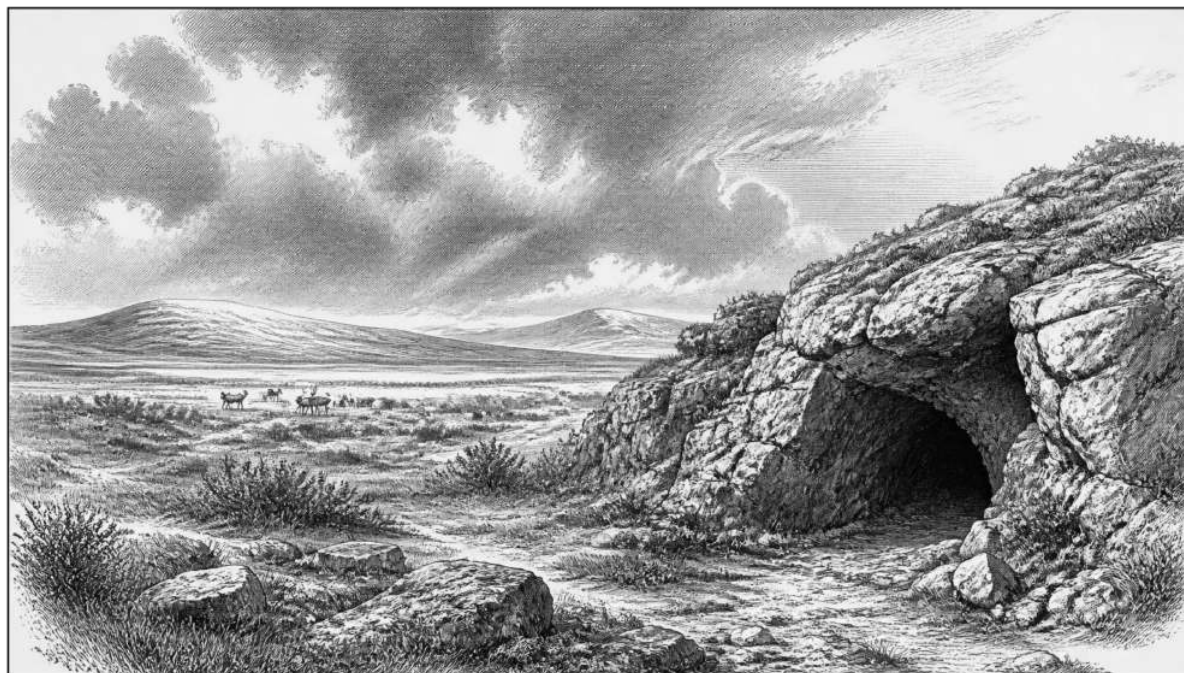
Nothing currently found in Ireland at or near 31,979 BCE allows archaeologists to identify religious rites, images, music, spoken languages or systems of teaching. Caves can seem inherently ceremonial to modern eyes, especially because spectacular cave art is known elsewhere in Ice Age Europe. That association is not proof that Castlepook or any Irish cave was a shrine, gallery or burial place. The scientific value of these sites lies first in their faunal deposits and their potential to preserve rare traces of human action. Absence of evidence is not proof that visitors had no beliefs, stories or skills; it means that the surviving record cannot responsibly describe them.

The enduring historical development at this date was environmental rather than political. Ireland was being shaped by the climatic deterioration that would culminate in the Last Glacial Maximum. Ice, meltwater and freezing ground would scour bedrock, transport boulders, reshape drainage and lay down sediments that still structure the Irish landscape. Later deglaciation would create new lakes, wetlands and coastlines, and only much later would sustained Mesolithic settlement become visible in the archaeological record. Around 31,979 BCE, Ireland stands at the edge of that long transformation: a cold and variable land with Ice Age animals, perhaps visited by people, but with its human history preserved only in the faintest and most carefully qualified of traces.

Chapter 023 of 100

31978 BCE

Doneraile Reindeer Bone^[23]



Modern calendar-year precision cannot be applied to Ireland in 31,978 BCE. The number is a retrospective label, not a date that anyone living then could have recognised, and evidence from this depth of time is normally expressed as calibrated ranges rather than single years. In archaeological terms, this point falls in the later part of the Pleistocene, before the Last Glacial Maximum, during the Upper Palaeolithic world of north-west Europe. For Ireland, it is a period illuminated chiefly by geology, animal remains and a small, contested-looking but important body of evidence from caves. There is no written record, no known settlement, and no secure basis for narrating a year-specific Irish event.

An Island on the Edge of Change

About 34,000 calendar years before present, the land now called Ireland stood in a colder, unstable North Atlantic environment. This was not yet the peak of the last great glaciation. Reconstructions differ in local detail, but they agree that the British–Irish Ice Sheet expanded dramatically afterwards, reaching or approaching its greatest extent between roughly 27,000 and 23,000 calibrated years ago. By the height of that episode, much or perhaps nearly all of Ireland was under ice. In 31,978 BCE, therefore, the central historical fact is not an Irish kingdom, migration or monument, but a changing physical landscape on the threshold of severe glaciation.

That distinction matters. It would be misleading to imagine the whole island as a single, static white wilderness or to project the familiar green Ireland backwards into this period. Ice margins advanced and retreated over long timescales; conditions varied by region, altitude and proximity to the Atlantic. Much of the evidence used to reconstruct this world lies offshore or in landforms shaped and later overprinted by ice: sediment fans, moraines, streamlined terrain, erratic boulders and glacial deposits. These preserve

the movements of ice rather than a photograph of one particular year. They nevertheless show that Ireland's geography, coastlines, drainage and soils were being profoundly prepared by the glacial processes that followed.

Lower global sea levels altered surrounding seaways, but they do not license an easy claim that a permanent, open land bridge joined Ireland to Britain or continental Europe at this precise moment. The Irish Sea basin, ice cover, changing shorelines and routes available to animals and people remain subjects of active reconstruction. What can responsibly be said is that the island's relation to neighbouring lands was different from today and that animal populations had reached it during favourable phases of the Ice Age. Whether humans travelled by the same routes, and how often, are separate questions.

Castlepook's Elusive Clue

The closest evidence to this nominal year comes from Castlepook Cave near Doneraile, County Cork. Caves there produced a rich collection of Pleistocene animal bones during excavations in the late nineteenth and early twentieth centuries. Modern re-examination and radiocarbon work have shown that some of the fauna are very old, including material from before the Last Glacial Maximum. A reindeer femur has been reported as dating to around 33,000 years ago and bearing a mark interpreted as having been made by a sharp stone tool during butchery. A County Cork heritage publication accordingly places the object broadly around 31,000 BCE, close to the date considered here.

This is potentially momentous evidence, but it must be handled with care. The bone is not a settlement floor with tools, hearths, shelters and securely associated food debris. It derives from an old cave collection whose original excavation methods did not provide the stratigraphic control expected today. Carnivores could drag carcass parts into caves; water and sediment movement can mix deposits; and a cut-like mark requires microscopic and contextual assessment before it can demonstrate human action beyond reasonable doubt. Recent fieldwork at Castlepook has specifically sought intact deposits and clearer archaeological context. Its purpose is not merely to repeat an exciting claim, but to test it.

Thus the reindeer bone is best described as evidence consistent with a possible human visit or butchery episode in pre-glacial Ireland, not proof of a settled Ice Age population. If the modification is confirmed as anthropogenic, it would suggest that Upper Palaeolithic people entered Ireland at least intermittently far earlier than the long-established Mesolithic colonisation. It cannot tell us the visitors' names, language, group size, season of arrival or length of stay. Nor can it demonstrate uninterrupted ancestry between such visitors and Ireland's much later inhabitants. The ice advance that followed would have erased landscapes and disrupted any short-lived occupation.

Animals and Open Country

The cave fauna provide the clearest picture of everyday ecology. Castlepook has yielded remains attributed to animals including reindeer, giant deer, brown bear, Arctic fox, wolf, cave hyena, hare, lemming and, in older collections, mammoth. Not every species necessarily lived there at the same time, and not every bone represents a local death. Yet together they show that Ireland could support a cold-stage fauna very unlike that of the modern island. Reindeer are especially important: they indicate open environments capable of sustaining grazing herds, while Arctic small mammals point to severe climatic conditions.

Rather than dense woodland, parts of the landscape would have supported tundra-like or steppe-tundra vegetation: grasses, sedges, herbs, dwarf shrubs and sparse tree cover where conditions allowed. Such country was shaped by cold, wind, seasonal scarcity and mobile animals. Caves were useful traps in the archaeological record because they sheltered and accumulated bone, but that does not mean they were routinely inhabited by people. Indeed, predators may account for much of the assemblage. Hyena, wolf and bear behaviour is central to interpreting what survives. The cave record is a record of ecological interaction, scavenging and natural deposition as much as of human activity.

For a hypothetical visiting human party, reindeer would have been a valuable resource: meat, fat, hide, sinew, antler and bone each had practical potential in Upper Palaeolithic lifeways elsewhere in Europe. But that is an interpretation based on wider comparison, not something directly demonstrated at Castlepook. Ireland has not yielded a securely dated stone-tool assemblage, camp, weapon point or hearth from around 31,978 BCE. The responsible conclusion is narrower: a dated animal bone may preserve a trace of carcass processing, while the wider faunal assemblage establishes a challenging but biologically productive Ice Age setting.

People Without a Society?

No. Even if people did reach Ireland, they had society, knowledge and culture; archaeology simply cannot recover their particular Irish forms from the present evidence. Across Upper Palaeolithic Europe, *Homo sapiens* groups used sophisticated stone technologies, organised hunting and food sharing, made ornaments and images, and transmitted practical knowledge over generations. It is reasonable to regard any visitors to Ireland as participants in this broad human world. It is not reasonable to assign them a named archaeological culture, a particular tool kit, cave art, burial custom or ethnic identity on Irish evidence alone.

There is consequently no identifiable political affair for this date. No chieftdom, territory, alliance, diplomatic exchange or organised conflict can be demonstrated in Ireland. A cut-marked bone does not reveal a hunting party's internal leadership, still less warfare. Equally, there is no evidence for a settled economy, farming, markets or long-distance trade on the island. Any people present were most plausibly highly mobile foragers making short, opportunistic use of a changing landscape, but even this is an inference rather than an excavated campsite.

The same restraint applies to religion, culture and learning. There are no known Irish ritual sites, graves, carvings or portable artworks securely dated to this period. The absence is not proof that visitors lacked beliefs, storytelling, ritual or technical expertise; all human groups possess cultural knowledge. It means that no specifically Irish expression can yet be identified. Ireland's later prehistoric tombs, rock art and farming communities belong tens of millennia in the future and should not be anticipated here.

What This Date Means

31,978 BCE is important because it directs attention to a deep and difficult chapter in Irish history: not an empty preface before "real" settlement, but a landscape where climate, ice, animals and perhaps occasional people interacted. Its evidence is fragmentary precisely because later glaciation remodelled the land and because the most revealing finds often came from antiquarian cave excavations. Re-dating old museum collections, analysing cut marks, mapping caves and searching for undisturbed sediments are therefore historical work of the first importance.

The balanced picture is one of possibility bounded by uncertainty. Ireland around this point may have received Upper Palaeolithic hunters following or exploiting animal resources, as the Castlepook reindeer bone has been interpreted to suggest. It was not, on present evidence, a known permanent homeland with villages, political institutions or a recoverable cultural tradition. Soon afterwards, the expanding ice sheet transformed the stage. The story of this date is ultimately the story of a fleeting human question set against an overwhelming environmental change.

Chapter 024 of 100

31977 BCE

Derryvree Beneath the Till^[24]



The label 31,977 BCE is a modern way of locating a point far beyond the reach of written history, personal memory or calendar keeping. It should not be mistaken for a year that anyone in prehistoric Ireland could have named, nor for a date at which archaeology can identify an event, a ruler, a battle or a settlement. In archaeological usage it corresponds approximately to 33,926 calibrated years before AD 1950 (cal BP), the conventional reference point for ‘Before Present’ dating. At this depth of time, even well-dated deposits normally yield ranges rather than single years. The responsible subject is therefore Ireland around c. 34,000 cal BP: an interval in the Late Pleistocene when climates shifted rapidly and the last great Irish ice sheet was beginning, but had not yet reached its fullest extent.

A Landscape Near a Threshold

Modern Ireland is used here as a geographical shorthand. There was no Irish state, no people called Irish, and no political territory with fixed borders. The island’s present coastlines were also a poor guide to the land and sea of the time. Global sea level was substantially lower than today because immense volumes of water were stored in continental ice sheets. Yet lower sea level did not automatically create a convenient dry crossing between Ireland and Britain: local land levels and water depths were altered by the changing weight of ice, while the Irish Sea basin remained a major environmental barrier. Any discussion of travel or contact must therefore remain conditional rather than imagining a simple land bridge.

In the broad climatic sequence, this date falls within Marine Isotope Stage 3, a long, unstable phase before the conventional global Last Glacial Maximum, usually placed at roughly 26,500–19,000 cal BP. It was not a uniform ‘Ice Age’ landscape. North Atlantic climates swung repeatedly between colder stadials

and relatively milder interstadials, sometimes over timescales far shorter than the archaeological periods familiar from later prehistory. Such variation matters because glacier growth, vegetation and the accessibility of coastal and inland terrain did not change everywhere at once.

The best current Irish evidence places c. 34,000 cal BP close to a major transition, not at a secure moment of island-wide ice cover. Research on the last Irish component of the British–Irish Ice Sheet indicates that north-central Ireland was ice-free until at least about 34 ka, before substantial ice-sheet build-up and expansion. This is a conclusion from dated sediments and landforms, not a photograph of one day in one place. It means that, around the nominal year, conditions could have differed markedly between districts, and that the precise timing of advancing ice margins remains uncertain.

Evidence Beneath Later Ice

The key evidence is geological. At Derryvree near Maguiresbridge in County Fermanagh, organic freshwater silts and fine sands lay between thick sheets of glacial sediment. Their radiocarbon measurement, calibrated to approximately 36,900–31,700 cal BP, demonstrates that an ice-free episode preceded the deposition of the later tills. The preserved flora and fauna have been interpreted as indicating open tundra vegetation and a periglacial climate: cold ground conditions shaped by freezing and thawing rather than dense woodland.

Nearby evidence from Greenagho, also in Fermanagh, is similarly important. Organic material in lacustrine deposits beneath till has produced an age range of roughly 37,200–35,700 cal BP. Together, these sites provide a minimum constraint: ice had not yet overridden those particular deposits by the time they formed. They do not prove that every valley in Ireland was open, nor can they establish what happened in 31,977 BCE specifically. Their value lies in showing that the later ice sheet expanded over landscapes which, during parts of late Marine Isotope Stage 3, had supported lakes, sediments, plants and invertebrate life.

Offshore records extend this story. Marine shells reworked into deposits at Glenultra in western Ireland imply that adjacent Donegal Bay had open water during much of the period before the westward expansion of the last ice sheet. Farther offshore, bathymetry, seismic profiles, sediment cores and dates show that ice later reached the Atlantic shelf edge west of Ireland and that the Irish Sea Ice Stream later surged south-west across the Celtic Sea shelf. Those impressive ice limits chiefly belong to the later part of the glacial cycle, especially about 27,000–23,000 cal BP, rather than to the nominal date under discussion. They explain why c. 34 ka is best viewed as a prelude: the landscape was approaching an episode that would greatly remodel it.

No Demonstrated Community

There is no accepted archaeological evidence for people living in Ireland around 34,000 cal BP. No securely dated hearth, stone-tool assemblage, dwelling, grave, butchered animal bone or artwork from this time has been identified on the island. That absence needs to be stated plainly. It is not evidence that humans were incapable of reaching the region: *Homo sapiens* occupied parts of Britain and continental Europe during the Upper Palaeolithic. But neither proximity nor possibility is proof of an Irish population.

The distinction is especially important because Ireland's earliest reported evidence of human activity is vastly later. A modified brown-bear bone from Alice and Gwendoline Cave, County Clare, has been dated to the terminal Pleistocene, approximately 11,060–10,440 cal BP; its cut marks have been argued to

record human handling. Clearer, more substantial Mesolithic settlement evidence appears only around 8000 BCE. These discoveries are historically important, but they cannot be projected backwards more than twenty millennia to fill the silence at c. 34,000 cal BP.

Later glaciation also helps explain why the record is difficult. Advancing ice eroded bedrock, incorporated earlier sediments and redeposited material as till; meltwater reworked valleys and basins; rising seas subsequently drowned parts of former coastal landscapes. A fleeting Upper Palaeolithic camp, if one ever existed, would have faced poor odds of preservation and discovery. This is a reasonable explanation for why evidence may be scarce, but it is not a licence to claim a lost settlement. Archaeology must distinguish a preservation problem from positive proof.

Life Without a Social Record

Because no community is demonstrated, there can be no evidence-led account of political affairs, diplomacy, conflict, kinship, religion, language, learning, art or trade in Ireland at this date. There were no known leaders, alliances, ceremonial centres or exchange networks on the island. Nor should later Gaelic traditions, medieval origin stories or the monuments of the Neolithic be treated as remote memories of this landscape. They belong to radically different societies separated from c. 34,000 cal BP by tens of thousands of years.

What can be described is the setting in which any human visitor would have had to operate. The Fermanagh deposits suggest sparse, open ground rather than the oak-, elm- and hazel-rich woodland of the much later Holocene. Short growing seasons, severe winter cold, exposed terrain and frequent climatic shifts would have constrained plant productivity and animal distributions. Lakes, rivers, patches of tundra vegetation and seasonally changing snow or ice would have mattered more than fields, roads or enduring built settlements. If people crossed into any ice-free part of Ireland, their presence would most plausibly have been mobile and temporary; that is an inference from the environment and wider Upper Palaeolithic lifeways, not an Irish find.

Likewise, animals should be approached cautiously. The fossil and sedimentary record can reveal environmental communities, but it does not give a complete census for this particular year. A cold, open habitat is compatible with grazing and browsing mammals and their predators, while freshwater deposits preserve evidence of smaller organisms and plants. It does not permit confident claims that a named herd, hunting party or species occupied a particular Irish valley in 31,977 BCE. The famous giant deer later associated with Ireland is not an appropriate emblem for this date simply because it became part of the island's Pleistocene story.

Ice as the Main Agent of Change

The central development was environmental and regional: the growth and movement of ice. The last Irish Ice Sheet was part of the larger British–Irish Ice Sheet system, whose sectors interacted across the Irish Sea and Atlantic shelf. Its advance was not merely a climatic backdrop. Ice could strip soils and weathered rock, deepen or redirect valleys, carry boulders far from their sources and lay down thick tills, sands and gravels. Much of the physical texture of modern Ireland—drumlins, streamlined rock, moraines, meltwater channels and glacially altered lowlands—was shaped or overprinted during this wider glacial history.

However, landscape features visible today cannot all be assigned to one advance or one year. Scientists combine field mapping with sediment stratigraphy, radiocarbon dating, optically stimulated luminescence dating, cosmogenic-nuclide exposure ages and offshore geophysics to reconstruct sequences. Each method has a different strength and uncertainty. For instance, a date from organic material beneath till can show that the site was ice-free when the material accumulated, whereas an exposure age on a boulder can help estimate when ice retreated and left it exposed. The resulting chronologies are powerful but necessarily probabilistic.

At the eventual local maximum, attained asynchronously in different sectors between roughly 30,000 and 22,000 cal BP, ice covered much of Ireland and extended offshore in several directions. Some high ground may have stood above erosive ice or supported thin, cold-based ice, but this varied by region and phase. The future advance was therefore neither a single wall arriving on a single date nor a uniformly thick blanket. Around c. 34,000 cal BP, Ireland was entering the long and uneven process by which this icy landscape was assembled.

What This Date Means

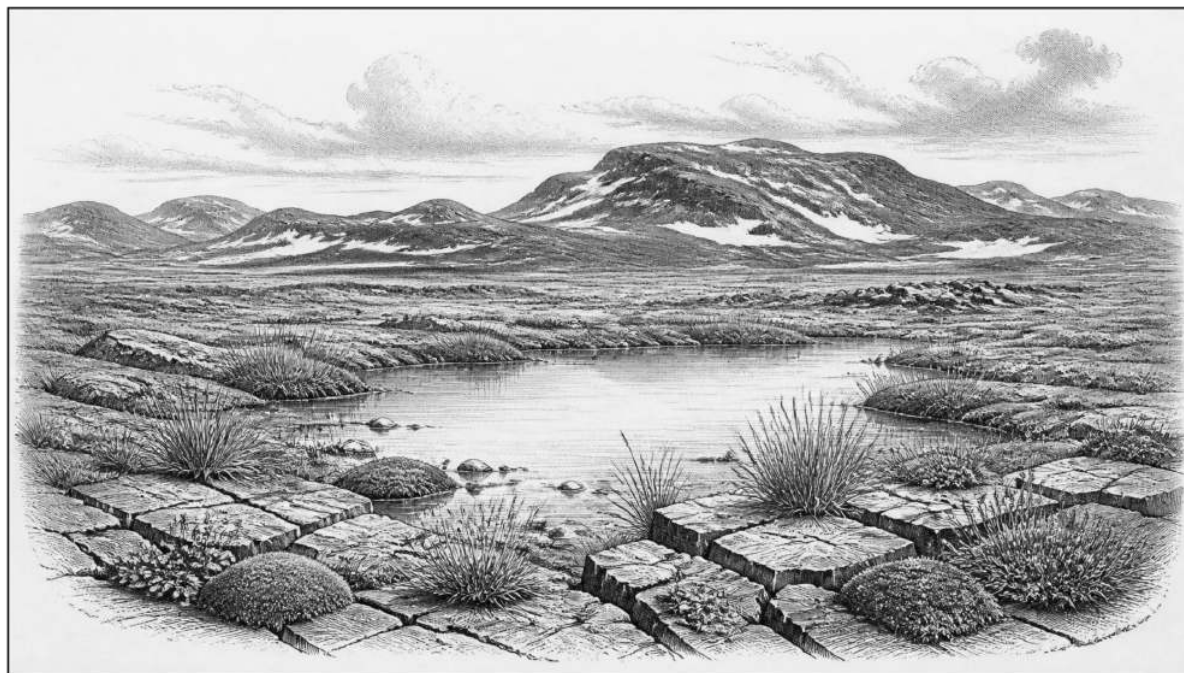
For Ireland, 31,977 BCE is not a year of kings, communities or monuments. It is a scientifically useful waypoint in deep time: approximately 34,000 cal BP, within a climatically volatile Late Pleistocene and close to the build-up of the last Irish ice sheet. The strongest local evidence comes from sediments beneath later glacial deposits, particularly in County Fermanagh, which preserve an ice-free, cold, open environment within calibrated ranges spanning the nominal date. The strongest conclusion about people is negative but important: none are securely evidenced in Ireland then.

That restraint is not a failure of history. It is the history appropriate to the evidence. Before Ireland's human story can be told through camps, tools, meals, ritual and exchange, the island's ground itself had to pass through the transformations of the last glacial cycle. Around 31,977 BCE, climate, water, sediments and expanding ice—not human politics—were the principal forces making the future archaeological landscape.

Chapter 025 of 100

31976 BCE

Derryvree Ice-Free Interval^[25]



“31,976 BCE” is a useful point on a modern chronological scale, but it is not a year for which Ireland has an event, a ruler, a settlement or even a securely dated human presence. No prehistoric community counted time in BCE, and archaeological dating cannot normally distinguish one calendar year at this depth of time. The responsible approach is therefore to place this notional date within calibrated ranges. It falls about 33,925 years before the conventional radiocarbon-present of AD 1950, in the later part of Marine Isotope Stage 3, a cold and climatically variable interval of the Late Pleistocene.

For Ireland, the most important evidence close to this point comes not from monuments or tools but from sediments, pollen, animal bones and the marks left by ice. These records show an island poised before the great expansion of the last Irish Ice Sheet. They allow a partial reconstruction of a treeless, severe and changing environment. They do not permit a conventional political or social history. Around this date, Ireland’s story is principally one of climate, land and animal life.

A Date Within a Range

The nearest particularly informative sequence lies at Derryvree, near Maguiresbridge in County Fermanagh. Road works exposed freshwater silts and fine sands later buried beneath glacial deposits. Organic material from the deposit produced a radiocarbon age of about 30,500 radiocarbon years before present; when calibrated, the published range is approximately 36,900–31,700 calendar years before present. The nominal year 31,976 BCE lies within that broad interval. It is not possible to say that the deposit formed in that exact year, but it is responsible to regard it as evidence for conditions in northern inland Ireland at roughly this time.

That distinction matters. Radiocarbon ages are not calendar ages, calibration curves have ranges rather than single answers, and a deposit may have accumulated over time. Nor should one Fermanagh exposure be turned into a weather report for the whole island. Its value is substantial nonetheless: the sediments indicate that north-central Ireland was ice-free until at least about 34,000 calendar years ago, before the principal build-up of the last ice sheet. Nearby evidence at Greenagho, also in Fermanagh, similarly preserves an earlier ice-free episode. These sites are rare survivals, protected beneath younger glacial material, and make Ireland unusually visible for a short part of an otherwise fragmentary period.

Cold Ground, Open Country

The plant evidence from Derryvree points to open tundra vegetation and a periglacial climate. Pollen was poorly preserved, as is common in ancient deposits, but it was chiefly from herbaceous plants; moss remains also survived. The landscape was therefore not the familiar green, wooded Ireland of later millennia. It was more likely a sparsely vegetated mosaic of grasses, sedges, herbs, mosses, wet ground and exposed mineral soil, shaped by intense cold, seasonal thaw and frost action. Patches of snow may have endured in sheltered uplands, while rivers and small lakes received sediment from unstable slopes.

“Periglacial” does not necessarily mean a land buried beneath an ice sheet. It describes a cold environment at or beyond a glacier’s margins, where repeated freezing and thawing can break rock, disturb soil and limit vegetation. At this point the Irish landscape was heading towards far more extensive glaciation, but the timing, thickness and exact limits of advancing ice varied between regions and remain matters of scientific reconstruction. The global Last Glacial Maximum is generally placed at about 26,500–19,000 years ago. In Ireland, dating and landform studies indicate a long transition from largely ice-free conditions around 34,000 years ago to a much enlarged ice sheet later in the glacial cycle.

This was thus neither a timeless frozen wasteland nor an early version of modern Ireland. The coastlines were also unlike those of today because much more of the world’s water was locked in growing ice sheets and sea level was lower. Yet local relative sea level around Ireland was affected by complex interactions among ocean level, crustal movement and the weight of ice. It would be misleading to draw a precise shoreline, land bridge or route of travel for 31,976 BCE from the available evidence. What can be said is that the Irish Sea world was changing rapidly in geological terms, and that later ice advance would heavily rework both terrestrial and offshore evidence.

Animals in a Fragmentary Record

Ireland was not necessarily lifeless. Cave collections and other fossil deposits demonstrate that a varied large-mammal fauna occupied Ireland during parts of Marine Isotope Stage 3, before the Last Glacial Maximum. The recorded fauna has included brown bear, wolf, Arctic fox, hare, reindeer, mammoth, giant deer and spotted hyaena. Such lists should be used carefully. A fossil from an Irish cave proves that a species was present when that individual lived; it does not prove a stable population across every region, or that every listed animal was alive in the single nominal year under discussion.

Indeed, reassessment of old radiocarbon measurements has changed the picture. Improved pretreatment and redating of bones from southern Irish caves showed that several earlier results were too young by thousands of years. Some species once thought to have persisted nearer the Last Glacial Maximum may instead have disappeared locally much earlier, perhaps by about 40,000 calendar years

ago. The correction is a useful warning against filling an imagined 31,976 BCE scene with a standard “Ice Age” menagerie. The evidence supports a cold-adapted and shifting Pleistocene fauna in Ireland; it does not support certainty about the precise local combination of animals at Derryvree on this particular date.

Predators, scavengers and herbivores would have belonged to ecological systems far different from those of historic Ireland. In open landscapes, animal movements could follow the availability of forage, shelter and seasonally accessible ground. Caves may have served as dens, traps for accumulated bone, or places where remains were later moved by water and sediment. Their contents are invaluable but taphonomically difficult: nineteenth- and early twentieth-century excavations often removed deposits before modern recording methods existed. Consequently, absence from the surviving record is not reliable proof that a species was absent from the island.

No Known Human Society

There is no secure evidence for people living in Ireland in 31,976 BCE. This means that there is no basis for identifying a population, language, kin group, leader, territory, ritual practice, camp, tool-kit, exchange network or conflict on the island. Political affairs, diplomacy and warfare are not merely unknown in detail: the archaeological record does not establish that any human society was present to undertake them. Nor can religion, learning, art, domestic routines, hunting practices, trade or social hierarchy be responsibly reconstructed for Ireland at this date.

That conclusion must not be softened by projecting the better-known Upper Palaeolithic cultures of continental Europe or Britain across the sea. Human groups elsewhere in north-west Europe demonstrably made sophisticated stone and bone tools, travelled widely, hunted, exchanged materials and created symbolic art. Those facts show what *Homo sapiens* could do in the wider world, not what people did in Ireland. Similarity of climate or geographical proximity is not evidence of an Irish occupation.

The island’s earliest reported stone object, a flint flake found at Mell in County Louth, illustrates the problem. It may have been made far earlier, perhaps 300,000–400,000 BCE, but was transported and redeposited by ice; it cannot establish an early Irish settlement. The first persuasive evidence of a human visit is vastly later: cut marks on a brown-bear kneecap from Alice and Gwendoline Cave in County Clare have been dated to roughly 12,810–12,590 calibrated years before present. That terminal-Pleistocene find is important, but it belongs more than twenty millennia after the date considered here. Substantial evidence for sustained settlement comes later again, with Mesolithic hunter-gatherers after the end of the Ice Age.

Approaching Transformation

The greatest development relevant to 31,976 BCE was therefore environmental rather than human: the approach of full glacial conditions. Global ice sheets were expanding, while Ireland was entering the sequence that would culminate in extensive cover by the Irish Ice Sheet, connected in places and phases to the wider British–Irish Ice Sheet. Later ice eroded bedrock, carried stones, laid down till and moulded landforms; its eventual retreat helped create the drumlins, corries, eskers, lakes and drainage patterns that remain conspicuous in Ireland.

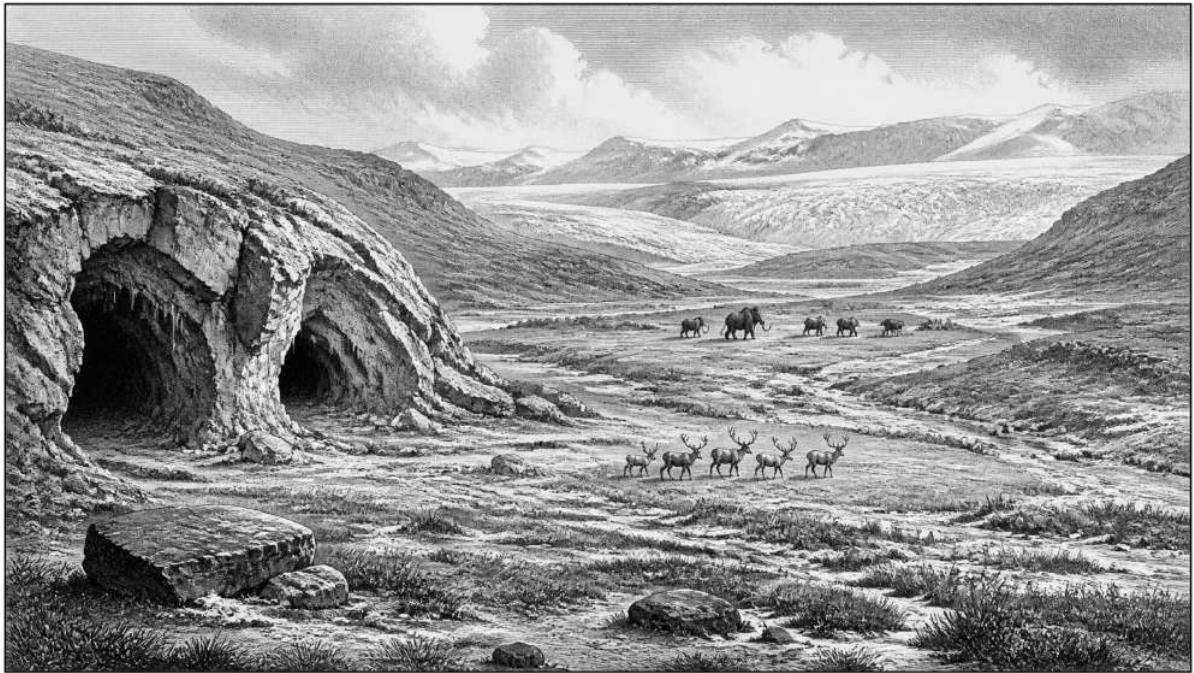
At this earlier point, however, Derryvree preserves a fleeting counter-image: inland ground not yet overwhelmed by the last major ice expansion, with freshwater sediment accumulating amid sparse tundra vegetation. It is a small window, not a complete panorama. Ireland in 31,976 BCE had no recoverable

history of kings, wars or monuments. Its recoverable history is quieter and deeper: cold air, open ground, plants close to the soil, mobile animals, and a landscape on the threshold of glaciation that would erase much of what had gone before.

Chapter 026 of 100

31975 BCE

Ice Before History^[26]



A Date Beyond Calendar History

31,975 BCE is a modern way of labelling a point almost 34,000 years before the conventional radiocarbon “present” of 1950—roughly 33,925 calendar years ago. It must not be mistaken for a year in which an Irish event can be dated. No written record, settlement sequence, ruler, battle, voyage or named community exists for Ireland at this depth of time. Even radiocarbon dates from this period produce calibrated ranges rather than single calendar years, and cave deposits often preserve material accumulated over long intervals. The responsible subject is therefore Ireland in the later part of Marine Isotope Stage 3, before the Last Glacial Maximum, not an imagined episode on a particular day or in a particular year.

This was the Upper Palaeolithic world: a cold, unstable phase of the Late Pleistocene in which climate repeatedly shifted between milder interstadials and harsher stadials. Ireland lay at the north-western fringe of Europe, in a landscape that was changing on geological as well as human timescales. The evidence is thin, but it is significant. It comes principally from animal bones, cave sediments, glacial landforms and modern re-dating programmes, especially in the limestone country of southern Ireland. These remains tell us much more securely about environments and animals than about people. Yet one disputed-looking but potentially momentous trace from County Cork means that humans can no longer be excluded from Ireland at this early date.

A Cold, Changing Island

At around 31,975 BCE, the great British–Irish Ice Sheet was growing, but it had not yet reached the full extent associated with the Last Glacial Maximum, conventionally placed around 26,000–19,000 calendar years ago. BRITICE-CHRONO research indicates a long phase of ice-sheet expansion from about 31,000 to 26,000 years ago, with major ice build-up over Ireland later in that interval. This does not licence a simple picture of an entirely ice-covered island in 31,975 BCE. Conditions differed sharply by region, season and century. Some uplands and central areas may already have been affected by expanding ice, while evidence from caves in the south shows that animal communities occupied at least parts of the Irish landscape during the wider period.

The landscape was not Ireland as modern visitors know it. There were no oak woods, hedgerows, enclosed fields, bog roads or familiar coasts. Cold, open vegetation—varying between tundra, steppe-tundra and sparse grassland according to climate and locality—would have supported grazing animals where land was exposed. Strong winds, frost action and seasonal snow shaped slopes and soils. Lower global sea levels altered the outline of surrounding seas, but that does not establish a straightforward, dry land route from Britain into Ireland. Marine geology and relative sea-level history are complex, while ice, water and changing coastlines created barriers as well as possible corridors. Any human movement to or within Ireland would have depended on conditions we cannot reconstruct in detail.

The environment was also dynamic rather than uniformly frozen. The animal record at Castlepook Cave, near Doneraile in north County Cork, demonstrates that Ireland could support substantial mammals in the pre-maximum glacial world. Re-dating has shown that several older cave collections are considerably earlier than once thought, while also warning archaeologists that old radiocarbon measurements may require revision. A date from a bone establishes when that animal died, not necessarily the exact moment when a cave was used, when a mark was made, or when people passed through the surrounding countryside.

Castlepook and the Human Question

Castlepook Cave is central to any account of Ireland near this date. Excavations in the early twentieth century recovered thousands of bones from a complicated cave system. The material is now important precisely because it includes a broad Late Pleistocene fauna and because researchers can apply modern zooarchaeological and radiocarbon methods to historical collections. Reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena are among the species represented. Their presence should not be compressed into a single imagined herd or a single moment: the cave assemblage was accumulated through different episodes and natural agencies, including carnivores.

A reindeer leg bone from Castlepook, reported as dating to about 31,000 BCE, bears a cut mark identified by specialist study as consistent with a sharp stone tool used on fresh bone. If that interpretation is sustained, it is the earliest known evidence of human activity in Ireland by a very large margin. It would indicate that Upper Palaeolithic people had killed or butchered a reindeer in Ireland, or at least processed its carcass there. The find is directly relevant to 31,975 BCE because its broad date lies within the same late-MIS 3 world, though it cannot be assigned to this numbered year.

Its limits matter as much as its importance. The bone was recovered from an old excavation, not from a newly excavated, sealed living floor. No associated hearth, stone-tool assemblage, dwelling, human bone or repeated occupation horizon of the same age has yet been published from Ireland. Nor can the bone prove that hunters butchered the animal inside the cave: carcass parts may have been moved by

hyaenas or other scavengers after human processing elsewhere. The careful conclusion is therefore evidence of possible, and increasingly plausible, Palaeolithic human presence—not proof of a permanent population, a named culture, or continuous settlement.

Animals, Food and Survival

The faunal evidence nevertheless gives an unusually vivid outline of the ecological setting. Reindeer were well adapted to cold, open country and would have offered meat, fat, hide, sinew, bone and antler to any hunters able to take them. Giant deer, often called “Irish elk” despite being neither uniquely Irish nor an elk, were also part of the wider Late Pleistocene fauna. Woolly mammoth remains attest to an environment capable, at least intermittently, of sustaining very large grazing animals. Brown bears, wolves and spotted hyaenas were competitors, scavengers and predators rather than background wildlife. Castlepook is Ireland’s only known site for spotted hyaena remains, a reminder that the island’s Pleistocene animal world was far richer and less familiar than its later historic fauna.

For people, if present, life would have been mobile and precarious. Across contemporaneous north-west Europe, Upper Palaeolithic communities survived by skilled hunting, gathering, sharing food and maintaining clothing, shelter and tools in severe climates. Such comparative knowledge can suggest possibilities for Ireland, but it cannot fill the evidential gap. It is reasonable to infer that the processing of a reindeer required sharp-edged technology and practical knowledge of animal anatomy. It is not reasonable to state what language the people spoke, what garments they wore, whether they used bows, what group size they had, or whether they returned annually to Castlepook. Ireland has not yielded the securely dated toolkits needed to make those claims.

No Politics, No Monuments

Political affairs, diplomacy and organised warfare cannot be recovered for 31,975 BCE in Ireland. There is no evidence for chiefdoms, territories, borders, alliances or conflict between human groups. Nor is there evidence for farming, herding, metalworking, trade routes, towns, monuments or any settled economy. Those developments belong to vastly later periods. Even the word “Ireland” is an anachronism when applied to a Late Pleistocene landscape whose shorelines and ice cover differed from those of the modern island; it is used here only as a geographical convenience.

Religion, art and learning must be treated with the same restraint. Upper Palaeolithic Europe contains extraordinary evidence of visual art, ornament, burial practice and technical learning, but none can presently be demonstrated in Ireland at this date. A cut-marked bone records an action, not a belief. A cave containing fossils need not have been a shrine or a home. The most defensible cultural observation is that any humans who reached this far-western setting belonged to populations capable of making and using stone tools, navigating difficult landscapes, and exploiting large animals. Beyond that lies possibility, not evidence.

What This Date Means

The importance of 31,975 BCE lies not in a conventional historical event but in the revision of an old assumption: that Ireland had no human story before the end of the last ice age. The Castlepook reindeer bone, together with renewed study of cave faunas, makes that assumption untenable. It opens the prospect of brief, episodic Upper Palaeolithic visits or occupations in a landscape later heavily transformed by ice.

Glaciation could have eroded or buried many open-air sites, while rising seas may have removed others from the modern coastline. The scarcity of evidence may therefore reflect preservation as much as absence.

Still, scarcity requires humility. Around this point in deep time, Ireland was a changing cold-world habitat, inhabited demonstrably by Pleistocene animals and perhaps visited by small groups of human hunters. It was not yet a landscape of recorded communities or enduring settlements. Future excavations at Castlepook and other karst sites may sharpen the chronology, identify securely stratified artefacts, or alter present interpretations. Until then, the archaeological record supports a compelling but narrow conclusion: long before the later Mesolithic settlement of Ireland, people may already have left a fleeting, cut-marked trace in its Ice Age south.

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31974 BCE

Castlepook Reindeer Incision^[27]



The label 31,974 BCE is a modern way of placing a very remote point in time, not a date that people then used or could have recorded. In archaeological terms it corresponds approximately to 33,900 calendar years before present (where “present” conventionally means AD 1950). No evidence can identify an occurrence in this particular calendar year. The responsible question is therefore what Ireland was like within a broad interval around c. 34,000 calibrated years ago, in the Late Pleistocene, and what the fragmentary evidence can—and cannot—say about human activity.

This was a world long before written history, farming, permanent villages, metalworking, named peoples or political institutions in Ireland. It lay within the Midlandian cold stage, the Irish expression of the last glacial cycle. Around this date, the island’s landscape was entering a climatically unstable and increasingly severe phase before the Last Glacial Maximum. Ireland’s later Ice Age landscape, its soils, drainage and coastal shape would be profoundly altered by the advancing and retreating ice, but the precise condition of each district in 31,974 BCE cannot be reconstructed with calendar-year certainty.

Dating a Landscape, Not a Year

Archaeologists and Quaternary scientists use several clocks. Radiocarbon dates on bone are calibrated against changing atmospheric carbon levels and normally produce date ranges rather than a single exact year. Luminescence dating estimates when sediment was last exposed to light, while cosmogenic dating measures how long rock surfaces have been exposed to cosmic rays. Each method has uncertainties, and the evidence is unevenly distributed. A bone date records the death of an animal, not automatically the arrival of people; a glacial deposit can show that ice passed through an area, but not the weather on a particular day.

This caution matters especially in Ireland. Later glaciers eroded, transported and buried much of the earlier record. Many surviving Pleistocene animal bones were recovered from caves during nineteenth- and early twentieth-century excavations, often before modern recording standards. Cave sediments may have been disturbed by water, animals, earlier digging and later human activity. Consequently, the evidence is exceptionally valuable but must be read critically. Absence of a hearth, stone tool or dwelling may reflect destruction and discovery bias as much as the absence of people.

An Island Approaching Full Glaciation

At roughly 34,000 calibrated years ago, Ireland stood close to an important transition. Research on trimlines, glacially transported boulders, sediments and exposure ages indicates that parts of north-central Ireland remained ice-free until at least about 34 ka. The large BRITICE-CHRONO reconstruction begins at 31 ka because earlier constraints are sparse; at that later benchmark it models ice accumulation centres in Northern Ireland as the British–Irish Ice Sheet was developing. These findings do not justify a simple map coloured either wholly “ice” or wholly “ice-free” for 31,974 BCE. They instead show a changing mosaic in which uplands, local ice, open ground, snowfields and marine margins may have differed sharply across short distances.

The fully developed Last Glacial Maximum came later. Current syntheses place the greatest extent of Irish and British ice broadly around 27,000–23,000 cal BP, although individual ice lobes reached their maxima at different times. At that point ice covered Ireland and much of its continental shelf, in places extending to the Atlantic shelf edge. The scene around 31,974 BCE was therefore not the familiar post-glacial Ireland of lakes, blanket bog and woodland. It was part of the build-up to a much harsher glacial regime, with the scale and timing of ice advance still debated in detail.

Sea level was lower than today because vast quantities of water were stored in global ice sheets. The outline of the Irish landmass and its surrounding shelves was consequently different, but routes between Ireland, Britain and continental Europe are not safely reducible to a single “land bridge” story. Relative sea level depended on both global ocean volume and the rise or depression of the Earth’s crust under ice loading. Models and geological interpretations differ over precisely when dry, walkable links existed. What is clear is that the geography of access, animal movement and possible human travel was changing, and that sea, lowlands, ice and exposed shelf formed a dynamic rather than modern map.

The Castlepook Clue

The closest known evidence relevant to this broad period comes from **Castlepook Cave**, near Doneraile in north County Cork. Its old cave collections, now associated with the National Museum of Ireland, include abundant Late Pleistocene animal remains. A reindeer femur bearing a mark interpreted as having been made by a sharp stone implement has been publicised as dating to about 33,000 years ago, or approximately 31,000 BCE. That makes it potentially close in time to the year represented here and potentially the earliest evidence of human action in Ireland.

The wording is important. The bone supports neither a named community nor a settled population. It does not establish that hunters lived at Castlepook, that they occupied the cave, or even that the animal was killed there. The bone could have been processed elsewhere and its remains later carried into the cave by scavengers or water. No securely associated stone-tool assemblage, hearth, built shelter or human

remains presently provides a fuller account of these possible visitors. Recent excavations and research projects have sought such contextual evidence, precisely because the historic collections alone cannot resolve every question.

Nevertheless, the marked reindeer bone is significant. If the mark is correctly identified as butchery and is contemporary with the dated bone, it indicates practical engagement with animal carcasses by people using a sharp tool. Such an episode would fit the wider European Late Upper Palaeolithic world, in which highly mobile hunter-gatherers moved through cold environments and exploited large mammals. It would not, however, licence assigning Ireland to an Aurignacian or Gravettian culture: those labels depend on distinctive artefact assemblages, and none has yet been securely recovered from this Irish context.

Cold Country and Mobile Fauna

Castlepook and other Irish cave collections demonstrate that Late Pleistocene Ireland could support a striking, if changing, fauna. Reindeer, brown bear, giant deer, wolf, Arctic fox, lemmings, mountain hare, mammoth and spotted hyaena occur in the wider pre-Last Glacial Maximum record, though they were not necessarily all present in every locality or at the same moment. Improved radiocarbon pretreatment has revised some old dates substantially, underlining why a species list must not be treated as a photograph of a single year.

The most defensible broad environmental image is an open, cold landscape with grassland, herb-rich tundra or steppe-tundra vegetation rather than the closed forest often imagined for Ireland. Such terrain could sustain grazing and browsing animals, while caves offered denning places and places where bones accumulated. Frost weathering, seasonal snow, wind and increasingly extensive ice shaped the ground. Yet even this picture should be held at regional scale: local shelter, altitude, moisture, proximity to ice and changing climate would have created varied habitats.

Animals could have moved through this landscape in ways that people might follow, but fossils do not prove organised hunting. A cut-marked reindeer bone permits the narrower conclusion that carcass processing is plausible. Hunting, scavenging and the use of meat, hide, sinew, marrow or bone are reasonable possibilities, not documented facts for Ireland at this date. There is no direct evidence for food storage, clothing manufacture, fire-making practices or a seasonal round on the island, although all are known possibilities among contemporary hunter-gatherers elsewhere in Europe.

No Politics, No Recorded Diplomacy

Nothing supports claims about Irish kingship, tribes, warfare, treaties, religion or language in 31,974 BCE. There were no inscriptions and no indigenous oral traditions that can be traced securely to this depth of time. Nor are there monuments, burials or art in Ireland that can be assigned to this period. It would be misleading to describe a political map or a religious system simply because modern readers expect each year of history to have leaders and events.

If people did reach Ireland during this phase, the evidence best suits small, mobile groups rather than a state or a permanent village. Their social relationships, identities and beliefs are archaeologically invisible. Contact with groups in Britain or continental north-west Europe is conceivable because human populations there had sophisticated stone technologies and broad networks of movement; it is not demonstrated for Castlepook. Likewise, “trade” cannot responsibly be inferred without non-local

materials or identifiable exchange goods. The likely economy, if humans were present, was direct use of local animal and plant resources rather than farming, markets or long-distance commerce known from later prehistory.

What This Distant Date Means

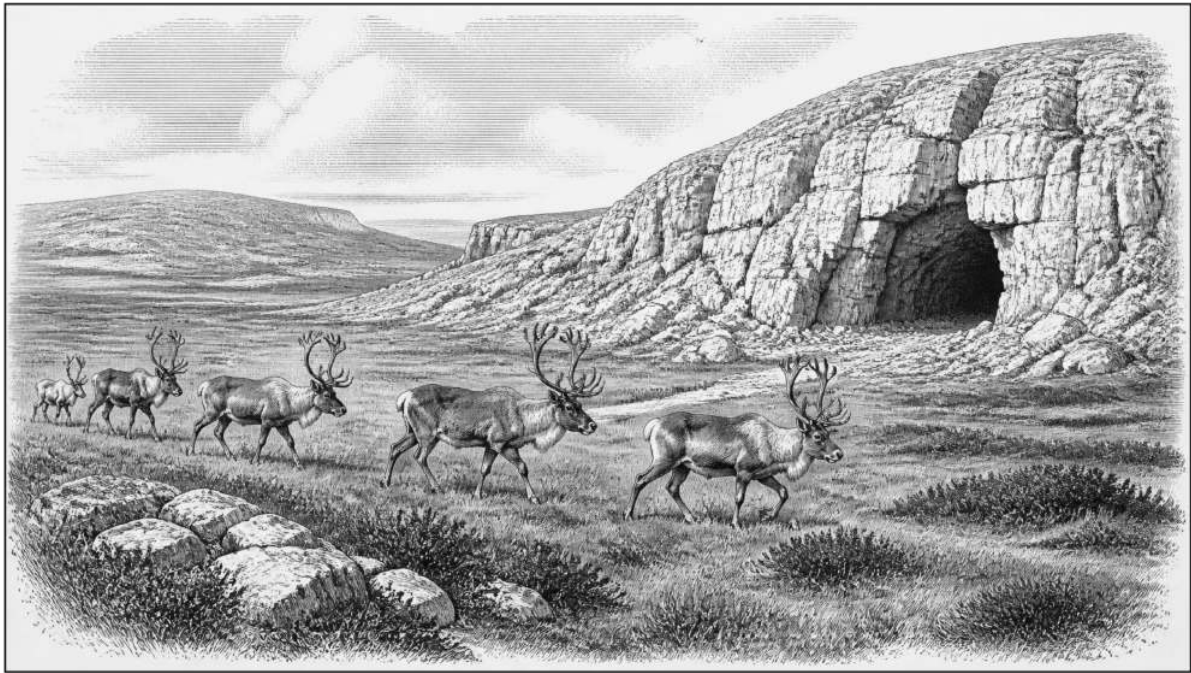
The chief development illuminated by 31,974 BCE is not a dated battle or foundation but a threshold: Ireland was moving towards extensive glaciation while retaining, at least in some places and times, environments used by Ice Age animals. The possible humanly modified reindeer bone from County Cork raises the prospect that people reached this north-western edge of Europe far earlier than the once-standard story of post-glacial settlement allowed. It is a powerful clue, but only a clue.

Later evidence is firmer. A butchered brown-bear bone from Alice and Gwendoline Cave, County Clare, has calibrated dates around 12,810–12,590 cal BP, and sustained Mesolithic settlement is documented only after the final retreat of the ice. Those much later milestones should not be projected backwards. For the time represented by 31,974 BCE, Ireland's history is principally a history of ice, land, animals and a tantalising possibility of transient human presence—an evidence-based beginning rather than a fully recoverable human story.

Chapter 028 of 100

31973 BCE

Castlepook's Marked Reindeer Femur^[28]



A Date Beyond the Annals

31,973 BCE is not a year that can be recovered in the manner of a historical year. No written record, named individual, settlement, tool assemblage or securely dated event permits a calendar-date narrative for Ireland at this depth of time. The number is a modern convention: expressed against the archaeological timescale, it falls at roughly 33,900 calendar years before present (where “present” conventionally means 1950), within Marine Isotope Stage 3, a long and climatically unstable part of the last Ice Age. Radiocarbon results from this era must be calibrated, and even calibrated ranges commonly span centuries or more. The responsible subject, therefore, is Ireland *around* this point, not an imagined occurrence on a particular day or in a particular year.

This was Upper Palaeolithic Europe, but it was not yet an “Ireland” of peoples, polities or inherited traditions. There were no Irish kingdoms, borders, diplomacy, towns, farms, monuments, writing or known religious institutions. Indeed, the evidence does not demonstrate a permanent human population on the island. What it does reveal is a changing north-west European landscape in which large mammals reached the Irish landmass, caves accumulated bones, and a small but consequential piece of evidence from County Cork may record a human encounter with a reindeer.

An Altered Land and Sea

During this part of the last glacial cycle, sea level was far lower than today because substantial quantities of water were locked in continental ice. The present Irish Sea, Celtic Sea and western continental shelf therefore looked very different. Ireland lay within a broader, exposed or shallow-water

north-west European zone, although the exact routes, coastlines and barriers altered repeatedly as climate, ice and sea level changed. It would be misleading to picture a simple, permanent land bridge linking Ireland to Britain or mainland Europe. Connections could be broad, broken, marshy, estuarine, coastal or ice-influenced; their practical usefulness to people and animals is still debated.

Glacial research makes one caution especially important. The British–Irish Ice Sheet did not behave as a static white blanket that either wholly covered Ireland or wholly vanished. It grew and contracted through successive cold phases. Its maximum expansion belongs later, broadly between about 26,500 and 19,000 calibrated years before present, and geological reconstructions show major advances affecting the Irish margins after the time considered here. Yet evidence for earlier ice growth and retreat during Marine Isotope Stage 3 remains complex and, in places, contested. Around 31,973 BCE, parts of Ireland may have offered habitable, open environments while other districts and routes were constrained by severe cold, glaciers, permafrost and unstable coastlines. Resolution is not fine enough to draw a precise national map for this notional year.

The likely landscape was markedly more open than the later wooded island familiar from the Holocene. The animal evidence points to a mosaic of grassland, herb-rich steppe-tundra, scrub and sparse vegetation rather than continuous forest. Such settings could sustain grazing herds, but they were harsh and seasonally exacting. Wind exposure, short growing seasons and rapid climatic shifts would have structured every animal movement and any human journey.

Castlepook Cave’s Fragile Clue

The most directly relevant evidence comes from Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. Excavations there in the early twentieth century produced a remarkable collection of Ice Age animal remains, now principally associated with the National Museum of Ireland. Later work showed that the cave deposits contained material from more than one period. That richness is an opportunity, but also a warning: antiquarian excavation methods, disturbed sediments, reworking within caves and incomplete recording mean that bones cannot automatically be treated as having been deposited together.

A fragment of reindeer femur from the Castlepook collection has been reported as bearing a deep mark interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone tool during butchery. It has been publicised as dating to around 33,000 BCE, close to the present article’s conventional target. County Cork’s heritage publication identifies it as a Palaeolithic reindeer bone from Castlepook and suggests that, if the interpretation is right, hunters processed the animal elsewhere before its remains reached the cave—perhaps carried in by carnivores or scavengers rather than brought there by people.

This is potentially Ireland’s earliest evidence of human activity, not proof of a settled community. No securely associated Palaeolithic stone toolkit, hearth, dwelling floor, human bone, artwork or burial has yet been recovered from Castlepook for this episode. Nor has the reported reindeer-bone evidence appeared as a full, peer-reviewed site report with a published calibrated confidence interval and an undisturbed archaeological context. Recent fieldwork at the cave has sought precisely the evidence needed to test such possibilities: stratified deposits, more modified bone, charcoal, lithics and a fuller reconstruction of how sediments and bones entered the chambers. Until that work produces decisive results, the fairest wording is that the bone offers a serious, provocative indication of a brief human presence or visit, rather than a demonstrated colonisation of Ireland.

A Fauna of Cold-Stage Ireland

Even without accepting the human interpretation, Castlepook and other southern Irish caves illuminate the ecological world. Radiocarbon programmes and subsequent re-dating have shown that mammals occupied Ireland during Marine Isotope Stage 3, though dates must always be assessed specimen by specimen. The wider Pleistocene fauna from Castlepook includes reindeer, woolly mammoth, giant deer, brown bear, wolf, spotted hyaena, Arctic fox, mountain hare and lemmings. Other Irish cave sites, including Shandon Cave in County Waterford, have produced remains of mammoth, reindeer, horse, bear, wolf and hare. Not every species was necessarily present at the same moment, nor in every locality; cave collections represent accumulations through time.

Nevertheless, the overall pattern is clear: Ireland was not biologically empty before the Last Glacial Maximum. Reindeer were suited to open, cold landscapes and could have moved in herds across wide northern territories. Giant deer, often misleadingly called “Irish elk”, were not uniquely Irish, but were a conspicuous Eurasian species. Mammoths and hyaenas demonstrate that at least some episodes supported an unexpectedly varied large-mammal community. Carnivores also explain much of the archaeological record. A cave can be a den, a death trap, a shelter, a sediment trap or a place into which bones were washed or dragged. Tooth marks, breakage, bone weathering and location within a cave matter as much as species names.

At Castlepook, the historic label “Mammoth Cave” reflects the discovery of mammoth remains, but that name should not encourage a cinematic scene of people hunting mammoths in Cork. There is no direct Irish evidence for such a hunt at this date. The most defensible picture is one of animal populations moving through changing habitats, with predators and scavengers accumulating bones in limestone caverns. If people reached the area, reindeer would have been a practical source of meat, fat, hide, sinew, antler and bone; that is a reasonable inference from hunter-gatherer economies elsewhere in Upper Palaeolithic Europe, not an excavated Castlepook campsite.

People: Possibility Rather Than Population

By roughly 34,000 calendar years before present, *Homo sapiens* groups were widespread in parts of western and central Europe. Their material cultures included sophisticated stone-blade technologies, hunting equipment, ornaments and, in some regions, cave art. None of this allows an Irish attribution. The absence of diagnostic tools means that Ireland’s possible visitors cannot responsibly be labelled Aurignacian, Gravettian or by any other cultural tradition. Nor can their language, ancestry, appearance, beliefs, social organisation or route of travel be reconstructed from one modified bone.

If the Castlepook mark is anthropogenic, the most restrained interpretation is of a small, mobile hunting party making a short incursion into the Irish region during a favourable interval. Such people may have followed animal movements, explored newly accessible ground or exploited a seasonal resource. They need not have lived in the cave, and there is no basis for estimating their number. Their journey may have involved crossings over exposed coastal plains, crossings of channels, or routes that changed with sea level and ice. This possibility is historically important because it shifts the question from “when was Ireland first permanently settled?” to “how often, how early and under what environmental conditions did people reach it?”

Permanent settlement is a much stronger claim. It implies repeated occupation, social reproduction, reliable access to food and fuel, knowledge of local seasons, and material traces across more than one site. Ireland’s presently secure archaeological record does not provide that case for 31,973 BCE. The later,

well-documented Mesolithic settlement of the early Holocene should not be projected backwards. A fleeting Upper Palaeolithic footprint, if confirmed, may have left almost nothing after millennia of erosion, glaciation, changing sea levels and limited early excavation.

Society, Culture and the Limits of Evidence

Political affairs, diplomacy and organised conflict cannot be described for Ireland around this date because no evidence identifies communities, leaders, territories or encounters between groups. Equally, there is no Irish evidence for ritual practice, formal burial, art, teaching, music or symbolic objects in this period. Caves have powerful associations in later prehistory, but it would be an error to turn Castlepook into a shrine merely because it is a cave. Its demonstrated importance is palaeontological; any human cultural role remains unproven.

Economy and trade must be treated with the same restraint. A visiting foraging group would have possessed knowledge, tools and social connections acquired beyond Ireland, but no traded object or imported raw material has been identified in a secure Irish context of this age. The only economy that can be discussed directly is that of the ecosystem: grazing animals converting sparse vegetation into biomass, predators and scavengers exploiting carcasses, and caves preserving fragments of that web. For potential human visitors, subsistence probably centred on hunting and careful carcass processing, but that remains an interpretation supported by the reindeer bone rather than a known Irish way of life.

What This Year Means

The significance of 31,973 BCE lies in uncertainty honestly handled. Ireland at this point was a glacial-age land within a wider European environmental system, inhabited at least intermittently by a varied cold-stage fauna. Castlepook Cave preserves one tantalising possible sign that humans entered that world far earlier than the traditionally accepted post-glacial settlement horizon. But the evidence is neither a village nor a people's history in the ordinary sense. It is a bone, a mark, a date reported at broad scale, and a programme of research still testing its implications.

That modest record has large consequences. It encourages archaeologists to re-examine museum collections, date individual bones with improved techniques, distinguish cut marks from natural damage, and investigate undisturbed cave sediments. In this deep past, the most compelling story is not a fabricated first Irish family or a presumed prehistoric event. It is the patient movement from possibility to proof: a reindeer bone from north Cork, an Ice Age fauna, and an island whose earliest human traces may be far older—and far more fragile—than once believed.

Chapter 029 of 100

31972 BCE

Marine Isotope Stage Three ^[29]



“31,972 BCE” is a useful modern label, not a date that people or landscapes in prehistoric Ireland could have recognised. No annual chronicle, settlement sequence or event can be assigned responsibly to this particular year. In calibrated archaeological terms, it corresponds only approximately to 33,900 years before present (cal BP, where ‘present’ is conventionally AD 1950). At this depth of time, radiocarbon results are expressed as probability ranges, deposits may have been disturbed, and the distinction between a fossil’s age and the date at which it entered a cave matters greatly. What can be described is Ireland during the later part of Marine Isotope Stage 3: a cold Ice Age world, before the fullest expansion of the last British–Irish Ice Sheet.

A Landscape in a Changing Ice Age

Ireland was entering a period of profound climatic deterioration. The Last Glacial Maximum itself lay ahead, conventionally placed at roughly 26,000–19,000 cal BP, but ice sheets were already growing across the north-west European margin. Reconstructions differ over precisely when particular Irish districts became ice-covered and how far ice extended at successive stages. That uncertainty is important: it rules out a single, confident map for 31,972 BCE. Nevertheless, the broad sequence is secure. Ireland was not yet the wholly ice-dominated land it would become later in the glaciation, while the advancing cold was reshaping habitats, river systems, coastlines and routes of animal movement.

Sea level was far lower than today because immense quantities of water were stored in continental ice sheets. Ireland therefore did not have its modern coastal outline, and the Irish Sea basin was a very different physical barrier. Connections between Ireland, Britain and the European mainland varied with sea level, ice extent and local topography. It is safest not to call this simply a permanent ‘land bridge’:

some routes may have been dry, others ice-covered, wet, or difficult to cross. For mobile animals—and potentially for people—the western edge of Europe was more connected than the island geography familiar today, but it was also climatically harsh and unstable.

The vegetation was not the green, wooded Ireland of later prehistory. Cold-stage environments supported open, treeless or sparsely vegetated landscapes, often described in broad terms as tundra-steppe or mammoth-steppe. Grasses, sedges, herbs, dwarf shrubs and patches of hardy scrub would have mattered more than forest. Wind, frost and seasonal scarcity were fundamental forces. Glaciers and periglacial processes later scoured, buried and reworked large areas, helping to explain why this early record is so fragmentary. The drumlins, corries, U-shaped valleys and spreads of glacial sediment visible in Ireland today are, in part, legacies of these later ice advances and retreats rather than a direct snapshot of this one moment.

Animals in the Fossil Record

The strongest Irish evidence for this general period comes from animal remains, especially those recovered from limestone caves. Castlepook Cave, near Doneraile in north County Cork, is particularly significant. Antiquarian excavations there produced a remarkable assemblage that includes remains attributed to mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. The species list conveys an Ice Age ecosystem far richer in large mammals than modern Ireland. It also cautions against imagining a uniform Arctic wasteland: the presence of animals with differing ecological requirements reflects change through time, varied microhabitats and a record accumulated over many episodes.

Recent redating has transformed the chronological discussion. Improved collagen pretreatment and accelerator mass spectrometry have shown that some older radiocarbon determinations from southern Irish caves were too young. Work on Castlepook places important parts of its fauna in Marine Isotope Stage 3, before the Last Glacial Maximum; the revised evidence indicates that species such as giant deer and spotted hyaena may have disappeared locally before the glacial peak. These findings make the cave central to understanding the Irish Pleistocene, but they do not mean every bone was deposited in the same season, century or even millennium.

Caves are both precious archives and difficult ones. Carnivores can drag prey into them; water can wash bones through fissures; sediment can slump; and early excavations rarely recorded layers to modern standards. At Castlepook, some deposits were disturbed and much original contextual information was lost. A mammoth bone demonstrates that mammoths occurred in Ireland during the relevant broad phase; it does not prove that a herd stood outside the cave in 31,972 BCE. Likewise, the coexistence of reindeer and hyaena in a collection need not establish a single local food web at one exact date. Responsible interpretation begins with those limits.

The Question of Human Presence

There is no securely dated campsite, hearth, stone-tool assemblage or human burial in Ireland that can be assigned to around 33,900 cal BP. Consequently, there is no basis for describing an Irish community's leaders, households, languages, religious practices or territory at this time. The long-standing position of the National Museum of Ireland—that clear evidence for a Palaeolithic human presence has not yet emerged—captures the necessary caution.

There is, however, an important developing question. Examination of a reindeer bone from Castlepook has identified marks interpreted by some researchers as possible stone-tool cut marks, and its reported age is broadly close to the period represented by this article. If that interpretation is confirmed through full publication, taphonomic analysis and securely contextualised evidence, it could indicate a very early human visit to Ireland before the Last Glacial Maximum. It would be a major discovery. At present, though, the bone is not equivalent to proof of sustained settlement. Natural damage, carnivore activity, excavation history and the absence of an associated tool assemblage all require restraint.

The distinction is more than academic. The earliest widely accepted direct evidence for human activity in Ireland is much later: cut marks on a brown-bear patella from Alice and Gwendoline Cave, County Clare, dated to approximately 12,810–12,590 cal BP. More enduring settlement is documented later still, in the Mesolithic, including Mount Sandel in County Londonderry. These later discoveries demonstrate that people eventually reached and used Ireland, but they must not be projected backwards to fill the deep Pleistocene gap.

No Politics, but a Wider Human World

It would be misleading to manufacture political history for Ireland in 31,972 BCE. There is no evidence for kingdoms, diplomacy, warfare, formal trade routes, monuments, farming or organised religion on the island at this date. Nor are there Irish artefacts from which to infer everyday dress, food preparation or learning. If people did enter Ireland, they would have belonged to highly mobile Upper Palaeolithic hunter-gatherer societies known elsewhere in Europe, equipped with sophisticated knowledge of animals, seasons and stone technology. Yet that is a continental comparison, not evidence that such a group lived permanently in Ireland.

The economy that can be observed is ecological rather than human: grazing and browsing animals converting sparse vegetation into biomass; predators and scavengers following them; and caves occasionally preserving the traces. Any human movement, if it occurred, would probably have been tied to the same seasonal geography of game, shelter and safe passage. That remains an interpretation, not a demonstrated Irish lifeway.

Why This Distant Moment Matters

Around 31,972 BCE, Ireland was on the threshold of an environmental transformation that would erase much of what came before it. The later advance of the British–Irish Ice Sheet removed or deeply altered many potential open-air archaeological deposits. The scarcity of finds is therefore not proof that no person ever arrived; it is evidence that survival, discovery and interpretation are exceptionally difficult. Caves such as Castlepook, museum collections, improved radiocarbon methods and renewed fieldwork offer the best prospects for refining the story.

The responsible picture is thus compelling precisely because it is incomplete. Ireland was a cold, open and changing part of the north-west European world, inhabited by Ice Age animals and approaching much more severe glaciation. A human presence near this point in time is possible, perhaps even suggested by one contested line of evidence, but it is not yet securely demonstrated. The history of this year is not a tale of named people or events; it is the deep precondition for every later Irish landscape, ecosystem and settlement.

Chapter 030 of 100

31971 BCE

Ice-Age Ireland^[30]



The label 31,971 BCE creates an impression of precision that the evidence cannot sustain. Nobody in Pleistocene Ireland used a numbered calendar, and neither archaeology, radiocarbon dating nor glacial geology can identify an event in one modern year so far back. In the radiocarbon convention of “before present”, where present is AD 1950, the label falls broadly around 33,900 years ago. The responsible frame is therefore a multi-millennial interval within the Late Pleistocene, Marine Isotope Stage 3, and the Middle Upper Palaeolithic of north-west Europe—not a dated Irish “year”.

A Landscape Before the Ice Maximum

This was not yet the climatic climax commonly called the Last Glacial Maximum. That later phase is generally placed at roughly 26,000–19,000 years before present, when the Irish Ice Sheet covered most, and perhaps at times nearly all, of the island. Around 33,900 years ago, conditions were already cold, unstable and profoundly unlike those of modern Ireland, but the geological evidence indicates that substantial areas remained free of the expanding ice sheet. The precise extent of glacier ice changed through time and remains debated by region; it should not be imagined either as a wholly green island or as a country uniformly buried beneath ice.

Two dated sequences in County Fermanagh help set the limits of what can be said. Organic sediments at Derryvree have been calibrated to approximately 36,900–31,700 years ago, while deposits beneath till at Greenagho have yielded a range of about 37,200–35,700 years ago. Together, with other marine and terrestrial evidence, they indicate ice-free conditions in north-central Ireland until at least about 34,000 years ago, before the last Irish Ice Sheet substantially expanded. The conventional date used here lies close to that threshold, so it is better to speak of a changing, regionally varied cold landscape than to claim that a definite ice margin stood at any particular modern place in 31,971 BCE.

Sea level was far lower than today because so much water was locked in northern ice sheets. Ireland's coastlines therefore lay beyond their modern positions, and the Irish Sea basin had a geography very different from the familiar map. Connections, barriers, exposed lowlands, glacier-fed waters and changing shorelines all mattered to animal movement. Yet the exact routes available at one moment cannot be mapped securely. "Land bridge" is useful shorthand only if it does not conceal the complexity of cold-climate terrain, shifting sea levels and, later, ice occupying parts of the route.

Cold Open Country

The Irish evidence is too fragmentary to reconstruct a single national vegetation map for this moment. Nevertheless, the faunal and geological record points to open, treeless or sparsely wooded cold-stage environments rather than the dense temperate woodland of much later prehistory. Exposed mineral ground, grassland and herb-rich tundra-steppe vegetation would have offered forage in favourable areas. Wind, frost, seasonal snow and rapidly changing conditions shaped the land. Rivers carried sediment, slopes suffered frost action, and caves accumulated bones, sediment and material washed in from outside.

Irish caves are exceptionally important because later glaciers eroded or buried many open-air Pleistocene landscapes. Castlepook Cave, near Doneraile in north County Cork, is the richest known Irish site for vertebrate evidence from the period leading towards the Last Glacial Maximum. Its assemblage includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyena, alongside smaller cold-adapted animals recorded in cave deposits. Such lists do not mean that every species shared the same valley in the same season, or that all remains are precisely contemporary. Cave sediments can be mixed by water, carnivores, excavation and later disturbance. They do, however, demonstrate that Ireland formed part of a wider north-west European world in which large grazing mammals and their predators could reach suitable habitats.

Predators are especially instructive. Spotted hyenas used caves as dens or accumulated bones there through scavenging and transport; wolves and other carnivores could also alter an assemblage. A bone found in a cave is consequently not simple proof of where an animal died, much less of where people lived. Mammoth and giant deer evoke dramatic Ice-Age imagery, but reindeer are the species most directly relevant to the strongest present suggestion of human activity near this broad date. Any reconstruction must begin with this distinction between animal presence, carnivore behaviour and human action.

A Fleeting Human Trace

At Castlepook, a reindeer femur bears a cut-mark judged to have been made with a sharp stone implement during butchery. Heritage accounts place it at around 31,000 BCE, and it has been presented as the earliest known indication of human activity in Ireland. It is an important discovery, but it is not evidence for an established Irish population, a village or a named hunting people. No securely associated Palaeolithic stone-tool assemblage, hearth, dwelling floor, burial or human skeleton has been recovered from Ireland for this early phase. The bone itself was recovered from a cave context affected by natural processes, and the animal may have been butchered elsewhere before remains entered the cave.

The most cautious interpretation is that one or more Upper Palaeolithic hunters may have entered, crossed or briefly used part of Ireland during a relatively hospitable interval, exploiting reindeer and perhaps other large game. They may have travelled in small, mobile groups already familiar with the changing landscapes of Britain and continental Europe. That proposition is plausible because Homo

sapiens were established elsewhere in north-west Europe and because the cut-mark is consistent with carcass processing. It remains an interpretation, however, not a demonstrated migration, settlement or continuous occupation. The archaeological record cannot tell us whether the visit lasted hours, days or seasons, nor whether it had any descendants in Ireland.

This distinction matters because later archaeological periods can too easily be projected backwards. The more substantial evidence for hunter-gatherer settlement in Ireland belongs to the post-glacial Mesolithic, many thousands of years later. The well-known butchered brown-bear bone from Alice and Gwendoline Cave in County Clare dates to the terminal Pleistocene, approximately 12,890–12,678 calibrated years before present, not to this much earlier interval. It confirms another episode of human presence in a radically different late-glacial Ireland; it cannot fill the immense evidential gap between Castlepook's early hint and later settlement.

No Politics, No Recorded Beliefs

There is no basis for describing political affairs, diplomacy, leaders, tribes, warfare or territorial boundaries in Ireland at this time. Such institutions may be relevant questions for later prehistoric societies, but no Irish evidence from around 33,900 years ago identifies them. Equally, there are no Irish artworks, ritual deposits, graves, monuments, inscriptions or structures from which religion, language, learning or formal cultural traditions can responsibly be recovered. Upper Palaeolithic peoples elsewhere in Europe made sophisticated tools, ornaments, images and burial places, but those discoveries belong to their own archaeological contexts. They must not be treated as evidence that identical practices occurred in Ireland.

The same caution applies to everyday life. If people did visit Ireland, their economy was almost certainly based on foraging, hunting and the skilled processing of animal resources rather than farming, herding, metalworking or trade in the later sense. The cut-marked reindeer bone makes carcass butchery a reasonable inference; it does not reveal cooking methods, clothing, shelter design, kinship, seasonal schedules or exchange networks. A portable stone toolkit is likely in principle, since the mark implies a sharp edge, but none has yet been securely tied to the Castlepook event. The absence of evidence is partly a result of preservation and discovery, yet it still limits what historians may claim.

Ice, Erasure and Regional Change

The crucial long-term development was environmental rather than political. After this period the last Irish Ice Sheet grew and expanded, eventually reworking much of the terrain and removing, displacing or sealing earlier deposits. Geological studies suggest that the bulk of this ice sheet developed from initially ice-free conditions around 34,000 years ago and that inland ice did not reach Ireland's south coast until after about 24,000 years ago. The timing and thickness of ice varied between western mountains, central lowlands, the Irish Sea basin and southern Ireland. This is why apparently simple statements that Ireland "was" or "was not" glaciated can mislead when applied to a single early date.

For human history, the result is a severe archival loss. A transient hunting camp on exposed ground could have been destroyed by ice, rivers, solifluction and later soil formation. The lack of campsites does not prove that no people ever came. Conversely, it does not permit an imagined society to replace missing evidence. Caves such as Castlepook preserve an unusually valuable but selective record: bones, cave

processes and rare signs of encounter rather than a full social landscape. Continued re-examination of museum collections, improved radiocarbon pretreatment, ancient biomolecular work and carefully controlled cave excavation may yet refine the picture.

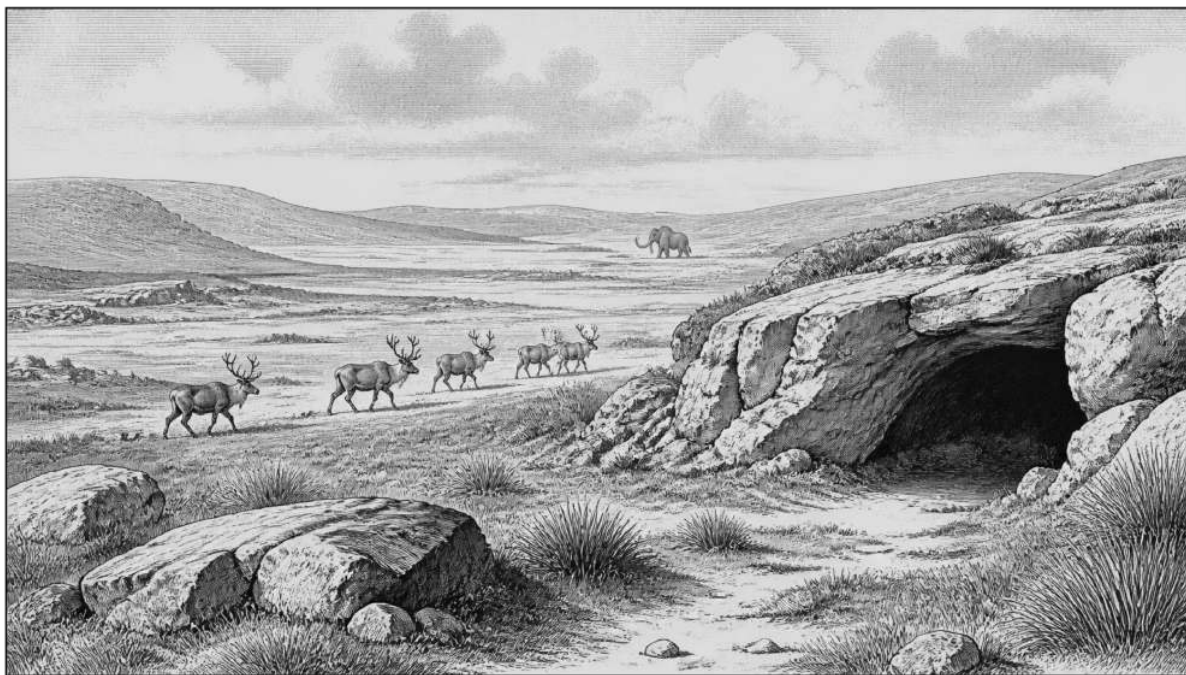
What This Date Can Mean

Ireland around the conventional date of 31,971 BCE was a cold, changing frontier at the north-west edge of Upper Palaeolithic Europe. Large mammals moved through suitable open habitats; predators left their own signature in caves; glacier ice was building towards a later maximum but had not simply engulfed every region at once. A cut-marked reindeer bone from County Cork offers a compelling, still limited indication that people may have reached this landscape. It does not yield an Irish nation, a settlement history or an event calendar. Its real importance lies in showing how a single carefully studied fragment can widen the known horizon of human contact with Ireland, while also reminding us how much of the earliest record has been lost.

Chapter 031 of 100

31970 BCE

Castlepook Cave Deposits^[31]



The label 31,970 BCE is a modern chronological convenience, not a date that can be isolated in Ireland's archaeological record. In simple calendar arithmetic it lies about 33,920 years before AD 1950, the conventional reference point for 'before present' (BP). Yet radiocarbon measurements, calibration curves, depositional disturbance and the limits of surviving evidence make year-by-year precision impossible. The responsible frame is therefore a broad interval around 34,000 calendar years ago, in the later part of Marine Isotope Stage 3 (MIS 3), before the fullest expansion of the last British-Irish Ice Sheet.

At this depth of time, Ireland has no written record, no named communities and no securely dated settlement surface from which to describe a particular year. What can be reconstructed comes chiefly from cave bones, cave sediments, glacial landforms, marine evidence and the later absence or survival of species. These sources illuminate changing landscapes and animal populations far better than individual human lives. They also demand caution: cave assemblages may have been accumulated by carnivores, water, roof-fall and nineteenth- or twentieth-century excavation, rather than by people.

A Changing Ice-Age Island

Ireland was within the last glacial period, but it should not simply be pictured as a country buried continuously beneath ice. The scale, timing and regional pattern of ice growth remain active subjects of research. Some evidence indicates that north-central Ireland retained ice-free ground until at least about 34 ka, while reworked marine shells suggest open water off north-western Ireland during portions of the preceding millennia. Other work argues for more extensive ice-sheet growth during the wider last cold stage. The most secure conclusion is that this was a transitional, climatically unstable world: ice was advancing in some sectors, but the island's cover was neither uniform nor fixed at a single moment.

Later, during the Last Glacial Maximum, roughly 26,500–19,000 calibrated years BP, ice became vastly more extensive. Large glaciers scoured bedrock, reworked sediments and transformed drainage systems, while ice flowing through the Irish Sea was connected to the wider British–Irish Ice Sheet. The resulting erosion helps explain why a very early archaeological record is so slight. Any camps on exposed ground, river terraces or coasts were vulnerable to destruction, burial or removal. Much of the landscape that people or animals might have used is now concealed beneath glacial deposits, altered by subsequent erosion, or lies beneath the sea.

Sea level was substantially lower than today, and Ireland's coastline was correspondingly different. This did not necessarily make movement from Britain or continental Europe simple or continuous. The geography of the Irish Sea basin, ice margins, meltwater and changing channels mattered as much as a general fall in global sea level. Fauna evidently reached Ireland during favourable phases, but the precise routes and timings varied by species. For human movement, any claim of a dry, uncomplicated land bridge at this particular point would exceed the evidence.

Open Country and Ice-Age Fauna

The strongest local evidence for conditions broadly relevant to this date comes from southern Irish cave deposits, especially Castlepook Cave near Doneraile, County Cork. Geological Survey Ireland describes it as the island's richest known site for vertebrate fauna leading up to the Last Glacial Maximum. More than 2,000 bones have been recovered there. The assemblage includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, as well as smaller cold-adapted animals such as Arctic fox, lemmings and mountain hare in later Ice-Age levels.

These remains establish that parts of Ireland could support substantial mammals during MIS 3. They do not demonstrate that all these species shared precisely the same landscape in 31,970 BCE, nor that each lived together at one time. Individual bones have different dates, and cave deposits may combine material gathered over thousands of years. Nonetheless, reindeer and mammoth point to broad, open habitats with abundant grasses, herbs and sedges; giant deer and red deer indicate that vegetation and shelter varied locally. In a cold North Atlantic setting, Ireland was likely a mosaic of exposed grassland, dwarf-shrub tundra, wet ground, rocky limestone country and, where climate and topography allowed, more sheltered patches of scrub or woodland.

Carnivores were part of that ecology and part of the archaeological problem. Spotted hyaenas could drag carcass parts into caves, gnaw bone and leave accumulations that can superficially resemble human food waste. Brown bears might use caves, while water could wash bones and sediment through fissures. Castlepook is therefore more than a list of spectacular Ice-Age animals: it is a lesson in taphonomy, the study of how remains reached a site and changed after deposition. The cave's old excavations and water disturbance mean that each specimen must be assessed before it is turned into a historical story.

Were People Present?

No permanent human occupation of Ireland is securely documented for around 31,970 BCE. Nor is there a recognised settlement, hearth, stone-tool assemblage or human burial that can be assigned to this narrow interval. The National Museum of Ireland accordingly stresses the long-standing absence of clear evidence for Palaeolithic human presence, while later discoveries have shown that the question is more complicated than it once appeared. The prudent conclusion is not that people certainly were absent, but that their presence at this point remains unproven.

There is, however, a reason to keep the question open. A reindeer femur from Castlepook Cave has been reported as bearing deep marks consistent with butchery by a stone tool and as dating to around 33,000 years ago. If securely demonstrated through direct dating, detailed microscopic analysis and firm contextual publication, such evidence would make an Upper Palaeolithic human visit to Ireland plausible within the broad time horizon of this entry. It would not prove an established population, a village or a continuous tradition. A single modified animal bone could represent a brief hunting or scavenging episode by a very small mobile group.

The claim must remain provisional. Reassessment of Irish MIS 3 cave fauna has shown that several older radiocarbon determinations from Castlepook and comparable caves are unreliable by modern standards of bone pretreatment and can be thousands of radiocarbon years too young. Current research has therefore shifted some supposedly late fauna further back in time. This is an important advance, but it also means that eye-catching dates from old collections require re-testing. At 31,970 BCE, the difference between a bone's uncalibrated radiocarbon age, its calibrated range and its archaeological context is decisive.

The best-confirmed direct evidence for people in Ireland is much later. A brown-bear kneecap from Alice and Gwendoline Cave, County Clare, bears cut marks and has two radiocarbon determinations calibrating to about 12,810–12,590 and 12,810–12,685 BP. Even that terminal-Pleistocene evidence is interpreted as a small-scale human incursion rather than proof of dense or enduring settlement. Substantial evidence for hunter-gatherer communities belongs later again, in the Mesolithic after the ice had retreated and new ecosystems had developed.

No Politics, No Proven Diplomacy

There is no basis for describing kingdoms, chiefs, laws, diplomacy, territorial borders or organised warfare in Ireland at this date. There are likewise no Irish monuments, artworks, languages, rituals or teaching traditions that can responsibly be attributed to 31,970 BCE. It would be misleading to project later Gaelic society, Celtic identities, farming communities, megalithic tomb builders or even the better-known Mesolithic hunters back into this far earlier setting.

If people did reach Ireland during this part of MIS 3, they would have belonged to highly mobile Upper Palaeolithic foraging societies known elsewhere in north-west Europe. Their livelihoods would probably have depended on close knowledge of animal movements, weather, raw materials and temporary shelter. That is a comparative interpretation, not direct evidence from Ireland. The island has not yet yielded the tools, structures or repeated activity areas needed to reconstruct food-sharing, kinship, seasonal rounds, spiritual practice or exchange networks here. The only responsible 'political history' is the acknowledgement that none is recoverable.

Regional Connections and Future Evidence

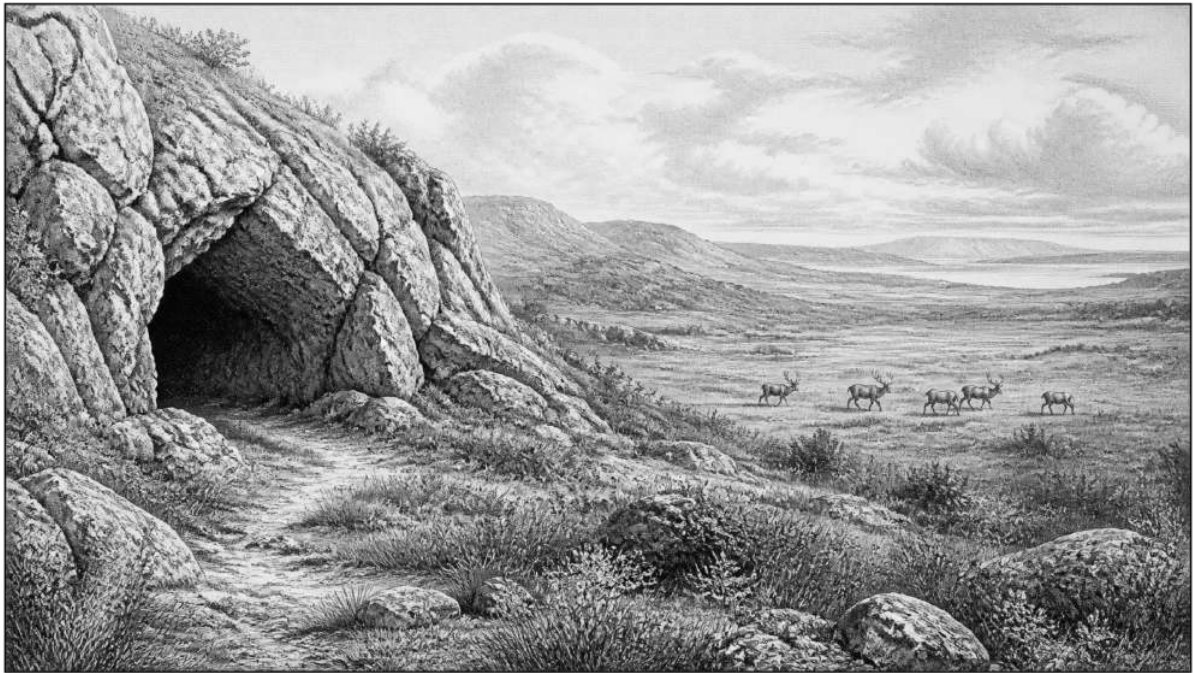
The fauna nevertheless shows that Ireland was not ecologically isolated. Mammals had entered during earlier windows of favourable connection, whether across exposed terrain, ice-linked routes or water gaps. Ireland's biological history was shaped by repeated dispersal, local extinction and later recolonisation as climate, ice and sea level changed. This changing connectivity is the most meaningful form of regional history available for 31,970 BCE.

Future work may sharpen the picture. Re-excavation of undisturbed cave deposits, direct accelerator mass spectrometry dating with rigorous collagen screening, ancient DNA, sedimentary DNA, stable-isotope study and microscopic analysis of bone modifications can test old assumptions. Offshore survey may also identify submerged landscapes that once lay closer to coasts, rivers and travelling routes. For now, 31,970 BCE stands not as a year of a recorded Irish event, but as a carefully bounded glimpse of a cold, changing land: one occupied securely by Ice-Age animals, increasingly affected by expanding ice, and only tentatively placed within the outer horizon of human activity.

Chapter 032 of 100

31969 BCE

Castlepook's Glacial Fauna^[32]



31,969 BCE is not a date that can be recovered from the Irish archaeological record as a particular year. It is a modern calendar label, placed almost 34,000 years before AD 1950 by simple arithmetic. At this depth of time, archaeologists work with broad phases, radiocarbon determinations and calibrated probability ranges, not anniversaries. The most responsible setting is therefore later Marine Isotope Stage 3, within the Upper Palaeolithic and before the fullest expansion of the last Irish Ice Sheet. The evidence illuminates a changing Ice Age Ireland, but it cannot identify an event, ruler, settlement or season in this numbered year.

A Landscape in Transition

The island lay within the long cold interval commonly called the Midlandian glaciation in Ireland, part of the wider last glacial cycle of north-west Europe. Yet it would be misleading to picture 31,969 BCE simply as the height of an unbroken, island-wide ice cap. The conventional Last Glacial Maximum came later, roughly 27,000–23,000 calibrated years before present in Irish reconstructions, when ice covered Ireland and extended across much of its continental shelf. Evidence for the preceding phase is more difficult to date and interpret. Recent syntheses recognise ice-sheet growth, retreat and renewed advance during Marine Isotope Stage 3, but also stress that securely dated glacial deposits for this earlier interval remain scarce.

That uncertainty matters. At a point conventionally represented by 31,969 BCE, some Irish uplands and regions may already have experienced substantial local or regional ice, while other areas were available to cold-adapted animals. No single map can responsibly portray the entire island on one precise day. The physical processes that later transformed the landscape were nevertheless under way: glaciers

eroded bedrock, shifted vast loads of sediment and depressed the land beneath their weight. The familiar outlines of valleys, lakes and lowlands were not yet the settled, vegetated scenery known from later prehistory.

Climate was harsh, but not static. Greenland ice-core sequences and North Atlantic records show pronounced millennial-scale fluctuations during this part of the last glacial period. Irish evidence is too fragmentary to reconstruct the weather of a particular generation, let alone this nominal year. It does support a broader picture of a largely open, treeless or sparsely wooded environment, with grassland, herbs, dwarf shrubs and exposed ground varying according to local shelter, altitude and climate. Wind, frost action and seasonal snow would have shaped surfaces that later ice sometimes reworked or removed entirely.

What the Caves Preserve

The chief evidence for Ireland at this depth of time comes not from villages but from caves, especially Castlepook Cave near Doneraile in north County Cork. A relict limestone maze, excavated chiefly in the early twentieth century, has produced more than 2,000 animal bones. Geological Survey Ireland describes it as Ireland's richest vertebrate-fauna site for the period leading towards the Last Glacial Maximum. Direct radiocarbon dates on individual bones span a very long interval, approximately 45,700 to 19,950 radiocarbon years before present. That range does not mean that all its animals lived together, nor that the cave was continuously occupied. It means that, over many millennia, its passages accumulated remains from successive Ice Age environments.

The assemblage establishes that Ireland supported, or was repeatedly reached by, a striking range of large and small mammals before the Last Glacial Maximum. Woolly mammoth, reindeer, giant deer, brown bear and spotted hyena are represented at Castlepook; later Ice Age deposits also include Arctic fox, wolf and lemmings. The cave's fauna offers powerful evidence that the island was not simply a sterile expanse throughout the glacial cycle. Reindeer and mammoth suggest open, productive cold-country habitats, while predators and scavengers indicate food webs more complex than any image of empty frozen wilderness permits.

But cave bone collections demand caution. Many were recovered by antiquarian excavators, before modern excavation standards, and have been disturbed by water, animal activity and earlier digging. A bone's date records the death of that animal, not necessarily the date when it entered the cave or the date of every associated find. Hyenas may themselves have transported carcass parts into Castlepook. Accordingly, the fauna supports regional ecological possibilities, not a neat census of animals standing together in County Cork in 31,969 BCE.

The Question of People

Human presence is the most important and the most uncertain issue. Ireland has no securely excavated house, hearth, burial, stone-tool workshop or occupation surface dating to around this calendar label. The well-published butchered brown-bear patella from Alice and Gwendoline Cave, County Clare, is much later: two independent determinations place it around 12,810–12,590 calibrated years before present. It demonstrates a terminal Pleistocene human presence, not an occupation 20,000 years earlier.

A re-examined reindeer femur from Castlepook Cave has been reported as bearing marks consistent with cutting or chopping by a stone tool and as dating to roughly 33,000 radiocarbon years ago. If the modification is confirmed and its context can be better established, it would be important evidence that

Upper Palaeolithic people reached Ireland far earlier than the previously accepted record. It must not, however, be turned into a story of permanent settlement. The object derives from an old, disturbed cave collection, and a full peer-reviewed technical publication establishing its taphonomy, tool-mark diagnosis and calibrated age has not yet furnished a wider archaeological assemblage around it.

There is also a chronological trap. A radiocarbon age expressed in “years BP” is not identical to a calendar age or to a BCE date. Atmospheric carbon varied over time, so determinations require calibration against curves such as IntCal20. At c. 30,000–40,000 years ago, the calibrated ranges can be broad. Thus an animal bone publicised as “33,000 years old” cannot honestly be pinned to 31,969 BCE. It is best treated as a potentially relevant indication of human activity during the broader later Upper Palaeolithic, rather than evidence for an event in this exact year.

Society Without a Settlement Record

If people did enter Ireland during this interval, they were hunter-gatherers using mobile technologies and living within a demanding northern environment. A cut-marked reindeer bone, if anthropogenic, would show carcass processing and the use of sharp stone-edged tools; it would not reveal whether hunters killed the animal, scavenged it, camped nearby or made only a brief visit. It cannot tell us their language, identity, population size, kinship system or route of arrival. Nor is there direct Irish evidence for clothing, boats, dogs, art, music or seasonal round at this time, although such practices are known elsewhere in Upper Palaeolithic Europe.

For the same reason, there are no political affairs to narrate. No chiefdoms, territories, diplomatic exchanges, wars or treaties can be identified. “Ireland” itself is used here only as a geographical convenience: there was no Irish polity, nation or historical community with that name. Nor can trade be demonstrated. Lower sea levels exposed parts of the seabed around north-west Europe, but changing ice loads, sea level and topography made connections between Ireland and Britain complex. Researchers continue to model possible land bridges and ice routes; whether a particular journey required dry ground, travel beside ice, short water crossings or some combination cannot be established for 31,969 BCE.

Belief, Culture and the Limits of Inference

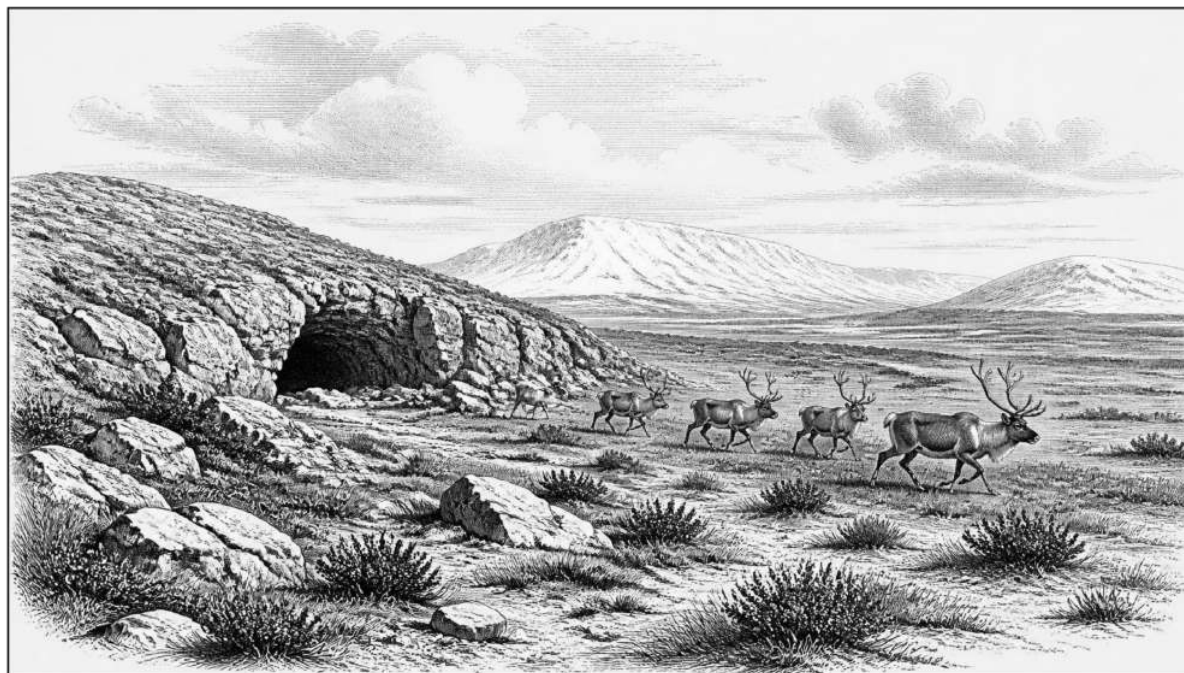
There is no Irish evidence for religious practice in this period. Caves can later acquire sacred associations, but a bone assemblage alone does not prove ritual, burial or ceremonial hunting. Similarly, the splendour of Upper Palaeolithic cave art and personal ornaments on the European mainland should not be projected across the Irish Sea. It provides cultural context for what contemporaries elsewhere could make and know, not proof that equivalent art was created in Ireland. The absence is partly archaeological: later glaciation could scour away open-air sites, and any coastal camps now lie beneath changed shorelines or marine sediments. Yet possible loss is not evidence of what was lost.

The most significant development represented by 31,969 BCE is therefore environmental and evidential rather than political. Ireland was part of the mobile ecological world of Ice Age north-west Europe, inhabited at different times by formidable mammals and increasingly affected by the growth of the British–Irish Ice Sheet. Castlepook Cave preserves a rare archive from that world. Its reindeer bone raises the possibility of very early human visits, while its disturbed context explains why the claim remains provisional. The record asks for curiosity, not certainty: before later ice advances remade much of the island, a cold and open Ireland may have offered fleeting opportunities to animals—and perhaps to people—for whom no enduring settlement has yet been found.

Chapter 033 of 100

31968 BCE

Fermanagh Subglacial Organics^[33]



The label 31,968 BCE cannot identify a day, season, ruler or event in Ireland. It is a modern backward projection of the Gregorian calendar, used here simply as a point of orientation. In archaeological terms it falls roughly 33,900 years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3, a long and climatically unstable part of the last Ice Age. Neither written records nor an archaeological sequence fine enough to isolate a single calendar year exists. The responsible history of Ireland at this depth of time is therefore environmental and archaeological: it concerns changing ice, coasts, animals, caves and the possibility—rather than certainty—of very occasional human presence.

Dating an Uncertain Landscape

Calendar-year precision is not available. Archaeologists and Quaternary scientists instead use calibrated ranges, usually expressed as *cal BP*, meaning calibrated calendar years before AD 1950. These ranges are not interchangeable with old radiocarbon ages, and they rarely map neatly on to a BCE label. For example, organic deposits beneath later glacial sediments at Greenagho in County Fermanagh have been dated to about 37,200–35,700 cal BP; they show that north-central Ireland had ice-free conditions until at least about 34,000 years ago. That evidence lies near, but not exactly at, the modern year label used for this article.

This distinction matters because the Irish Ice Sheet was not a single unchanging blanket. Its growth was regional, episodic and still actively debated. Reconstructions indicate that the major expansion leading towards the Last Glacial Maximum came later: the most extensive ice cover on the Atlantic shelf west of Ireland is securely associated with roughly 27,000–24,000 cal BP, with the global Last Glacial

Maximum conventionally placed around 26,500–19,000 cal BP. Thus 31,968 BCE belongs to the earlier build-up of the last glacial cycle, not automatically to the point at which every part of Ireland lay under thick ice.

Ireland Before Full Glaciation

The strongest conclusion is regional rather than island-wide. Some landscapes may have remained exposed while ice accumulated in mountain and upland centres or advanced across adjacent seas. The record from beneath later tills, cave deposits, raised beaches, offshore sediments and glacial landforms shows that conditions changed substantially over millennia. It does not permit a map for one named year. A cautious reconstruction places Ireland in a cold, open and highly dynamic north-west European setting, with ice margins and coastlines liable to shift as climate and sea level changed.

Sea level was considerably lower than today because large volumes of water were locked in continental ice sheets. The outlines of the Irish coast and the breadth of the surrounding shelves were therefore different, but lower sea level does not by itself prove a simple, continuous land route from Ireland to Britain or continental Europe at this particular time. Rivers, estuaries, shallow seas, ice and changing shorelines all complicated movement. The Irish Sea and Atlantic shelf were landscapes in their own right: sometimes marine, sometimes influenced by ice, and later reshaped by advancing glaciers and meltwater.

For the future physical geography of Ireland, this interval was important. Ice later eroded bedrock, carried sediment and deposited till; meltwater and retreating margins helped form landforms that remain conspicuous today, including streamlined drumlin terrain, moraines and spreads of sand and gravel. But these visible features generally record later phases of advance or retreat. They should not be treated as a frozen photograph of 31,968 BCE. The landscape at that point was one stage in a long process whose best-preserved evidence often dates thousands of years later.

Animals in the Cave Record

The clearest direct evidence for a living Irish environment around this broad period comes from animal remains, especially the exceptional cave system at Castlepook, near Doneraile in north County Cork. Geological Survey Ireland describes Castlepook as Ireland's richest site for vertebrate fauna leading up to the Last Glacial Maximum. Its assemblage includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyena, with later Ice Age remains also including Arctic fox, wolf and lemmings. These species demonstrate that, during the middle and later Ice Age, Ireland could support or receive a strikingly varied cold-climate fauna.

That list must not be turned into a confident scene set in one year. Castlepook's bones accumulated over a long span, were affected by carnivores and water movement, and were first extensively excavated in the early twentieth century. Individual bones have different dates; some older radiocarbon determinations have been revised after improved laboratory pretreatment. The cave is evidence for animal presence over episodes, not proof that every listed species grazed or hunted together outside the entrance in 31,968 BCE. Even so, mammoth, reindeer and giant deer point towards open habitats with enough vegetation to sustain large herbivores, while hyena, wolf and bear indicate a food web more diverse than Ireland's later historical fauna.

Spotted hyena is especially revealing. A cave can be a den, a carnivore feeding place, a shelter, a sediment trap or all of these at different times. Bones in such a setting may record animals carried in as prey or scavenged carcasses rather than creatures that died naturally nearby. The cave record is therefore a window into ecological relationships, but a partial and filtered one. It preserves hard material unusually well, whereas plants, insects, tracks, camps and wooden objects from exposed ground were far less likely to survive later glaciation, erosion and acidic soils.

People: Possibility, Not Settlement

There is no securely documented settlement, dwelling, hearth, tool assemblage or burial in Ireland that can be assigned to 31,968 BCE. Nor is there evidence for a resident population, named group or continuous Upper Palaeolithic occupation. The later, firmly established Mesolithic settlement record begins only around 8000 BCE, after the last ice had retreated and new woodland environments developed. That enormous chronological gap is a warning against projecting familiar images of prehistoric Ireland—farmers, monuments, tribes or villages—back into the Ice Age.

Claims of much earlier human activity deserve careful attention but equally careful wording. A reindeer bone from Castlepook has been reported as bearing marks consistent with processing by a stone tool and has been publicised as evidence for human activity about 33,000 years ago. If its anthropogenic interpretation and chronology are sustained by full contextual research, it would transform the history of human visits to Ireland. It would still indicate an episode of activity, perhaps a short hunting or scavenging incursion, rather than a settled community. The disturbed and complex nature of old cave collections means that this claim cannot responsibly be used to populate Ireland in a particular calendar year.

For now, evidence supports no account of political affairs, diplomacy, warfare, social hierarchy, language, religion, artistic traditions, formal learning, trade or domestic economy in Ireland at this date. Those are not missing chapters waiting to be filled by imagination; they are questions for which the surviving record is silent. If humans did reach the island or its changing coastal margins, they would have belonged to mobile Upper Palaeolithic hunter-gatherer worlds known elsewhere in Europe. But their technology, identities, routes, beliefs and duration of stay in Ireland remain unknown. Comparison can suggest possibilities; it cannot substitute for Irish finds.

Connection and Isolation

What can be said is that Ireland was not ecologically isolated in an absolute sense. The arrival of large mammals required connections, whether across changing sea barriers, ice-influenced routes or broader phases when movement through north-west Europe was possible. Yet animal dispersal is not evidence for human travel, and the island's selective fauna may help explain why archaeologists have so little early human evidence. Ireland lacked or only intermittently held some of the large game animals that were particularly significant to Upper Palaeolithic groups elsewhere. Its position at Europe's north-western edge imposed additional environmental and logistical constraints.

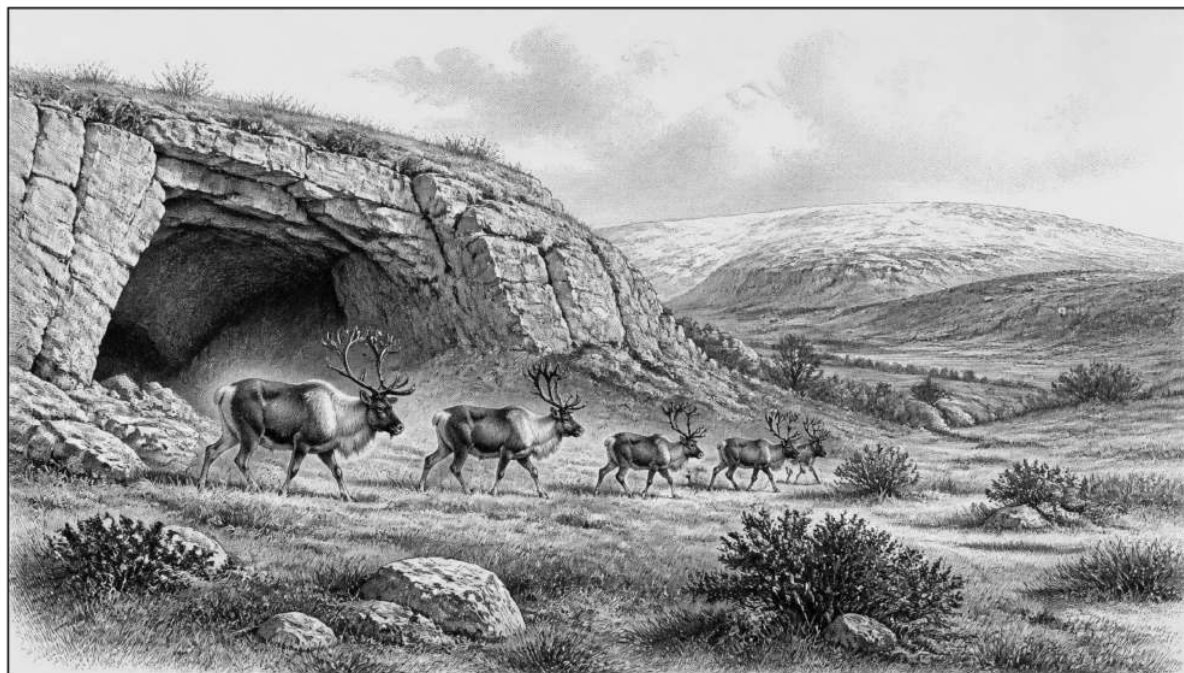
The most appropriate image of Ireland around 31,968 BCE is therefore neither an empty white wasteland nor a settled Ice Age homeland. It is a changing cold landscape at the threshold of more extensive glaciation: parts of it capable, over time, of supporting impressive mammals; parts increasingly affected by snow and ice; its shorelines unlike those of today; and its human story unresolved. The

period's importance lies in that uncertainty. Modern re-dating, cave excavation, marine survey, sediment analysis and cosmogenic dating continue to refine when ice advanced, when animals arrived and whether people ever briefly followed them into Ireland before the Last Glacial Maximum.

Chapter 034 of 100

31967 BCE

Castlepook Faunal Assemblage^[34]



The label 31,967 BCE is useful for ordering a long chronology, but it cannot describe a known Irish “year” in the ordinary historical sense. No written records, named individuals, dated settlements or year-specific events survive from this depth of time. In archaeological terms, it denotes a point roughly 33,900 calibrated years before 1950, within the Late Pleistocene. Even that conversion should not be mistaken for calendar precision: radiocarbon results are expressed as probability ranges after calibration, and the evidence available for Ireland belongs to spans of centuries or millennia.

A Land Before the Ice Maximum

Ireland at this point lay in the later part of Marine Isotope Stage 3, a prolonged cold phase within the last Ice Age. It was not yet the fullest extent of the last British–Irish Ice Sheet, whose major growth across the Irish and British region occurred later, especially between about 31,000 and 26,000 years ago. The familiar Last Glacial Maximum is generally placed much later, around 26,000–19,000 years ago. It is therefore misleading to picture all of Ireland in 31,967 BCE as buried beneath a single, static mass of ice. Ice cover, snowfields, permafrost, vegetation and coastlines changed markedly between regions and through time.

The best large-scale reconstruction suggests that, around 31,000 years before present, the British–Irish Ice Sheet was growing rather than fully developed. It was probably restricted to parts of Ireland and Britain before expanding over continental shelves. Such reconstructions are necessarily broad: they combine landforms, marine sediments, exposure ages and models, rather than offering a detailed map for

every century. For the date in question, the responsible conclusion is that Ireland was a severe, climatically unstable northern landscape approaching a more extensive glacial phase, not a landscape whose every valley can be assigned a certain ice margin.

Coasts and Changing Connections

Global sea level was substantially lower than today because immense quantities of water were locked in continental ice sheets. Modelling for approximately 31,000 years before present indicates relative sea levels in the British–Irish region some 50–100 metres below modern levels, although local effects varied as the weight of ice bent the Earth’s crust. The coastline was consequently unlike the modern Atlantic island shore. Wider plains existed around parts of the continental shelf, and the Irish Sea basin had a different form.

Lower water does not, however, license a simple assertion that people or animals walked freely from Britain into Ireland in 31,967 BCE. Whether a continuous terrestrial route existed depended on local sea level, crustal movement, river channels, topography and advancing ice; these conditions also changed through the Ice Age. The evidence supports a changing physical relationship between Ireland, Britain and the exposed north-west European shelf. It does not yet document a particular crossing, route or migration in this putative year.

What the Caves Preserve

Most evidence that illuminates this remote Irish past comes not from open-air camps but from cave deposits and old museum collections. Castlepook Cave, near Doneraile in north County Cork, is especially important. Geological Survey Ireland describes it as the richest known Irish site for vertebrate fauna in the long period before the Last Glacial Maximum. Excavations conducted between 1904 and 1918 recovered more than 2,000 bones, while areas left undisturbed retain considerable research potential.

The cave assemblage demonstrates that a varied cold-climate mammal community reached Ireland during the middle and later Ice Age. Identified remains include reindeer, giant deer, woolly mammoth, brown bear, spotted hyena, wolf, Arctic fox and lemmings. This is powerful evidence against any notion of an entirely lifeless Ireland. Yet it is crucial not to turn the site’s species list into a single illustrated scene dated to 31,967 BCE. The bones accumulated across a very long interval—published dates from Castlepook range from about 45,700 to 19,950 radiocarbon years before present—and may have been brought in by carnivores, water and other processes.

Modern re-dating has transformed the chronology. Improved collagen preparation, including ultrafiltration, showed that several older Irish cave dates had underestimated the antiquity of the material. Work on Castlepook, Foley and Shandon caves indicates a significant Irish fauna during Marine Isotope Stage 3, and suggests that some animals, notably giant deer and spotted hyena, disappeared locally before the later ice maximum. The result is a stronger basis for reconstructing Ice Age ecosystems, but also a warning that dates and interpretations can change as techniques improve.

Climate, Animals and Habitat

The animal record points to open, cold environments rather than the wooded Ireland of later millennia. Reindeer and lemmings are particularly informative indicators of harsh conditions; mammoth and giant deer belong to the wider Pleistocene large-mammal world. Open grassland, herb-rich steppe-

tundra, sparse shrubs and exposed mineral ground are plausible elements of the landscape. Valleys, limestone lowlands and river corridors may have offered different resources from uplands or glaciated tracts. But Ireland has a thin surviving environmental record for this exact age, partly because later ice repeatedly eroded, redistributed and buried older deposits. These habitat descriptions are informed reconstructions from fauna, regional climate evidence and comparable north-west European environments, not a direct pollen map for 31,967 BCE.

Predators mattered. Castlepook was not simply a natural archive into which animals wandered to die: its fauna and the condition of many bones indicate carnivore use. Hyenas could drag carcass parts into caves, consume them and leave fragmented assemblages; bears, wolves and other agents complicate the story further. This is why archaeological interpretation must distinguish a bone's date from the date of its arrival in a cave, and animal damage from human modification. Caves offer rare preservation, but they are palimpsests rather than sealed time capsules.

The Question of People

There is a potentially momentous, but not yet fully settled, human dimension to Castlepook. A reindeer femur fragment from the cave has been reported as bearing deep marks consistent with butchery by a stone tool and as dating to roughly 33,000 radiocarbon years before present. If the marks are securely confirmed as human-made, they would push evidence for human activity in Ireland far back into the Upper Palaeolithic. That claim must be expressed carefully. The scientific re-dating of the cave's fauna is published, but a full peer-reviewed technical publication of the human-modification case has remained awaited; the old excavations also left imperfect contextual records.

Accordingly, the femur is best described as candidate evidence for a very early human visit, not proof of a resident Irish population in this exact year. There is no securely dated house, hearth, lithic assemblage, burial or human skeleton from Ireland around 31,967 BCE. Nor can a butchered animal bone alone reveal the size, language, ancestry, seasonality or social structure of those who may have handled it. It may indicate a brief episode of carcass processing by mobile hunter-gatherers, perhaps connected to the exploitation of reindeer; it cannot establish a permanent settlement.

This distinction matters because the clearest evidence for repeated human occupation of Ireland belongs far later, after the major ice retreat. Terminal Pleistocene evidence from County Clare has generated debate of its own, while early Holocene hunter-gatherer settlement is far better represented. Absence of evidence at 31,967 BCE is partly an archaeological problem—glacial erosion, sea-level change and limited excavation have erased or submerged likely sites—but it remains absence of evidence. It should not be filled with invented camps, tribal territories or migrations.

No Politics, but a Human World Beyond Ireland

Political affairs, diplomacy and organised warfare cannot responsibly be recovered for Ireland at this date. There were no states, named polities, inscriptions or monuments from which to infer them. Likewise, there is no Irish evidence for religious rites, formal learning, art, farming, metalworking, trade networks or built villages. Agriculture lay tens of millennia in the future. If people did enter the island, their material economy would have depended on knowledge carried in bodies and tools: finding game, assessing weather, processing meat and hides, maintaining stone equipment, sharing food and moving through a demanding terrain. Those are reasonable general inferences from Upper Palaeolithic lifeways elsewhere, not documented facts about a particular Irish group.

In this sense, the most important development around 31,967 BCE was environmental rather than political. Ireland was part of a changing north-west European Ice Age zone, populated at least intermittently by animals able to exploit cold open country and increasingly affected by advancing ice. Castlepook Cave in Cork preserves a fragmentary record of that world. It makes Ireland relevant to the deep history of Pleistocene fauna and raises the possibility of an unexpectedly early human presence, while also demonstrating why caution is indispensable.

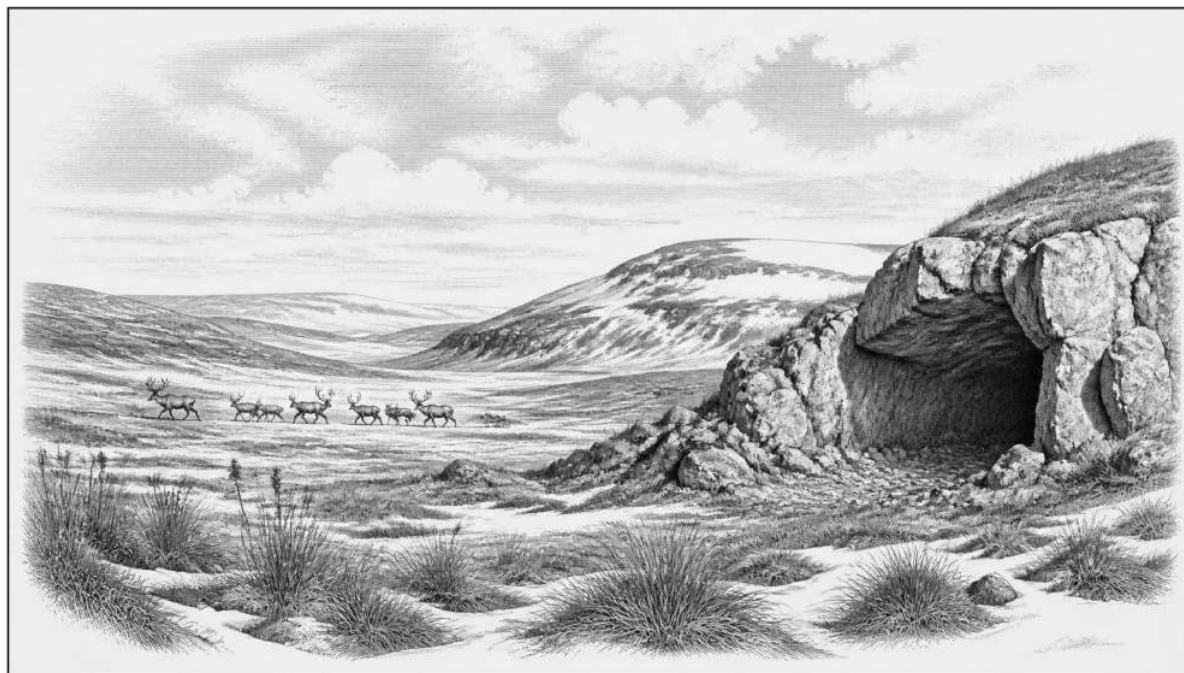
A Responsible Snapshot

For this date, Ireland cannot be narrated as a calendar year of kings, battles or discoveries. It can be understood as an Ice Age landscape in transition: colder than today, physically reconfigured by lower seas and growing ice, and inhabited by a changing assemblage of mammals documented most vividly in southern Irish caves. The evidence supports a pre-Last Glacial Maximum fauna and a possible Upper Palaeolithic human encounter at Castlepook; it does not support certainty about continuous occupation or ordinary social history. Future excavation, dating and microscopic analysis may refine this picture. For now, the archaeological record's greatest lesson is both dramatic and restrained: Ice Age Ireland was not empty, but its human story at this depth remains only a faint and contested trace.

Chapter 035 of 100

31966 BCE

Before the Ice Maximum^[35]



The label 31,966 BCE should not be mistaken for a date at which Ireland can be described year by year. No written records, rulers, settlements or securely dated events survive from this depth of time. In archaeological terms, it is a modern calendar shorthand for roughly 33,915 years before AD 1950, placing it in the later part of Marine Isotope Stage 3, a cold and climatically variable phase of the Late Pleistocene. Dates of this antiquity are normally reported as radiocarbon years before present or as calibrated ranges, not as precise BCE years. What can responsibly be reconstructed is an Irish landscape approaching the great cold of the Last Glacial Maximum, together with the exceptionally fragmentary traces left by animals, ice and perhaps occasional people.

A Cold, Changing Island

At this point Ireland was not the green, wooded island familiar today. It lay within the north-west European glacial world, exposed to severe climatic swings and profoundly altered sea levels. The Last Glacial Maximum proper came later: current syntheses place the last major advance of the Irish Ice Sheet broadly between about 27,000 and 23,000 calibrated years BP, although the timing and extent of ice varied markedly between regions. The British-Irish Ice Sheet was not a fixed white blanket that arrived everywhere at once. Its margins, flow routes and thickness altered over millennia, responding to climate, topography and the dynamics of fast-flowing ice streams.

Thus it would be wrong to state confidently that all of Ireland lay beneath continuous ice in 31,966 BCE. The date predates the clearest island-wide maximum. It belongs instead to the prolonged prelude to it: a period in which cold conditions, expanding upland and marine-based ice, exposed shelves and

shifting coastlines made the geography of Ireland very different from the modern state. Later glaciation would reshape the land still further, carving valleys, depositing till and moraines, and eroding or burying earlier deposits. That destructive history is one reason evidence for human activity of this age is so scarce.

Lower global sea level exposed broad areas now submerged around Ireland and Britain. Yet exposed seabed is not automatically a dependable land bridge. Whether people or animals could travel between Ireland, Britain and continental Europe depended on local sea level, ice position, water channels, seasonal conditions and the practical ability to cross them. Scholars continue to debate the details of Late Quaternary connections. The safest conclusion is that the physical barriers and routes were changing, and that Ireland's later insularity had deep consequences for its flora, fauna and human settlement history.

Evidence in Caves and Bones

The strongest direct evidence relevant to this era comes not from houses, tools or graves, but from animal remains in limestone caves, particularly in southern Ireland. Castlepook Cave near Doneraile, County Cork, is crucial because antiquarian excavations recovered a substantial Late Pleistocene faunal assemblage, while later dating and reassessment have demonstrated that some of its bones are much older than early radiocarbon determinations suggested. The cave has yielded remains attributed to animals suited to open, cold landscapes, including reindeer, mammoth, brown bear, giant deer, hare and predators such as spotted hyaena. These are not a complete census of an ancient Irish ecosystem: caves selectively preserve material, and carnivores as well as water, gravity and later disturbance can move bones into them. They nevertheless demonstrate that Ireland supported, or was visited by, a richer Pleistocene fauna than its modern fauna might suggest.

Faunal dates must also be handled with care. Recent work on Castlepook and other southern Irish caves has revised older chronologies through improved pretreatment and radiocarbon methods. Some animals once assigned to comparatively late phases are now thought to have lived in Ireland much earlier, within Marine Isotope Stage 3; giant deer and spotted hyaena may have disappeared locally before about 40,000 calibrated years BP. Consequently, a bone dated within a broad pre-glacial interval cannot establish that every species represented in a cave was alive in precisely 31,966 BCE. It does, however, support the wider picture of periodically open, cold-country habitats able to sustain large herbivores and their predators before the ice sheet reached its later maximum.

Such landscapes were likely mosaics rather than a uniform frozen waste: sparse grasses, sedges, herbs and low shrubs would have occupied suitable ground, while exposed rock, wind-blown sediment, snowfields, streams and ice margins formed obstacles and corridors. Mammoth, reindeer and giant deer point towards substantial grazing resources in at least some phases and places. Hyaena remains are especially important because they warn against a simple reading of caves as human camps. A cave assemblage may be the accumulated product of a carnivore den, scavenging and natural deposition rather than deliberate human storage or habitation.

The Human Question

One find has made this deep period newly important to Irish archaeology: a reindeer femur from Castlepook reported as bearing a cut mark consistent with a sharp stone tool and dated to approximately 33,000 years ago. Public accounts have presented it as evidence that Palaeolithic hunters butchered reindeer in Ireland around 31,000 BCE. If that interpretation is sustained, it would be the oldest presently

reported indication of human activity on the island by a very large margin. It would suggest not a settled population in the modern sense, but a brief visit or small-scale use of the landscape by mobile Upper Palaeolithic hunter-gatherers.

But the distinction between a promising clue and a fully documented settlement is essential. The bone derives from early twentieth-century cave excavations, for which modern standards of stratigraphic recording were unavailable. No securely associated Palaeolithic stone-tool assemblage, hearth, built shelter, burial or occupation surface has yet been recovered from Castlepook. The renewed archaeological investigation of the cave in 2022 reflects both the importance of the discovery and the need to establish its context more securely. The cut-marked femur is best treated as potentially momentous evidence of human butchery, not as proof of a permanent Irish community or a foundation date for the country.

The contrast with later evidence is instructive. A butchered brown-bear bone from Alice and Gwendoline Cave, County Clare, has been independently radiocarbon dated to about 12,810–12,590 calibrated BP and is widely regarded as evidence for a much later Late Upper Palaeolithic human presence. Even that find is a single modified bone rather than a village. More substantial and enduring settlement is not visible until the early Mesolithic, thousands of years afterwards. Long gaps in the archaeological record may represent absence, small and intermittent populations, lost sites, or a combination of all three.

No Politics, No Recorded Wars

There is no responsible basis for naming an Irish people, language, leader, tribe or territory in 31,966 BCE. Political affairs, diplomacy and organised warfare leave no identifiable evidence in Ireland from this moment. Nor can religion be reconstructed: no shrine, burial rite, artwork or symbolic object securely belongs to this date. A cut bone may speak to the processing of an animal; it cannot reveal ceremonies, myths or beliefs. Later Irish traditions, medieval origin legends and modern national identities are separated from this period by tens of thousands of years and cannot fill the evidential gap.

If people did reach Ireland, their economy would have been based on hunting, scavenging and the use of animal and plant resources available in a cold environment. Following migratory or seasonally concentrated herds is a plausible interpretation, especially for reindeer, but it remains an inference from the animal evidence and wider European Upper Palaeolithic practice. There is no direct evidence for farming, herding, pottery, metalworking, long-distance trade, formal exchange networks or permanent dwellings. Nor is there evidence from which to infer a population size. The most that can be said is that a small, mobile party could leave remarkably little archaeological trace.

How This Past Is Known

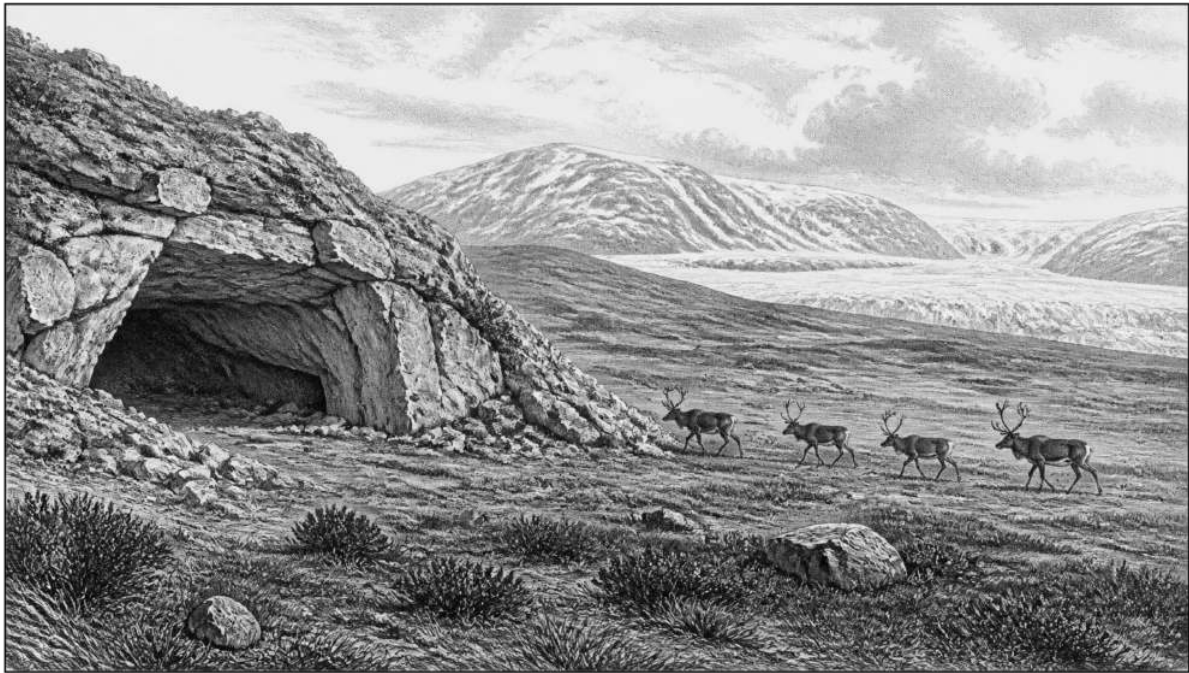
Ireland around 31,966 BCE is therefore illuminated chiefly by Quaternary science. Radiocarbon dating estimates when organic material ceased exchanging carbon; calibration converts radiocarbon results into calendar probability ranges. Stratigraphy establishes the sequence of layers, while zooarchaeology identifies species and studies cut marks, gnawing and weathering. Ice-sheet reconstruction combines landforms, offshore geophysical surveys, sediment cores and methods such as cosmogenic exposure dating. Each technique has uncertainties, and none turns this era into an annual chronicle.

The main historical development appropriate to this date is environmental rather than political: Ireland was entering the severe phase that would culminate in extensive glaciation, while its animal populations and any human visitors faced a volatile northern landscape. Cave deposits at Castlepook preserve a rare window onto that world. They show that Late Pleistocene Ireland was not simply an empty stage before later settlement, but a changing habitat used by large mammals and predators, and possibly by hunters. The task now is not to make the evidence say more than it can, but to investigate it with methods capable of separating a fleeting human visit from the much longer histories of ice, animals and landscape.

Chapter 036 of 100

31965 BCE

Crag Cave Calcite Growth^[36]



Modern calendar precision cannot be carried back reliably to 31,965 BCE. The number is a retrospective label, not a year recorded by anyone in Ireland, and it should not be treated as the date of a specific Irish event. In archaeological terms it corresponds only approximately to about 33,900 years before AD 1950, within the Upper Palaeolithic and Marine Isotope Stage 3, a long and climatically unstable part of the last Ice Age. The responsible history of Ireland at this point is therefore not a story of named communities, rulers or battles. It is an account of changing land, climate and animal life, reconstructed from caves, sediments, landforms and scientific dating.

A Date on a Vast Timescale

The distinction between calendar years, radiocarbon years and calibrated ages matters especially here. Radiocarbon measurements are not themselves calendar dates: their conversion into calibrated ranges depends on changing atmospheric carbon levels and carries margins of uncertainty. Nor do the available Irish deposits allow scholars to identify conditions in one numbered year. It is safer to speak of the interval around 34,000 calibrated years ago, and to test broad reconstructions against several independent forms of evidence.

That evidence places 31,965 BCE near an important transition in Ireland's last glacial history. Research on the British–Irish Ice Sheet indicates that the great ice mass expanded substantially after roughly 34,000 years ago, reaching much more extensive limits later, principally between about 28,000 and 24,000 years ago in several sectors. The global Last Glacial Maximum followed, conventionally dated to about 26,500–19,000 years ago. Consequently, it would be misleading to picture the whole island at 31,965 BCE as already buried beneath the fully developed ice sheet of the later maximum.

Equally, the evidence does not justify an image of a mild or familiar Ireland. This was a cold-stage world in which the positions of ice, sea, tundra and open ground could change markedly over millennia. The island's present coastline, woods, soils, bogs and fields did not exist. The landscape that can be discussed was a Pleistocene landscape, repeatedly altered by frost, moving water, ice advance and later erosion.

Ice-Free Ground, Growing Ice

The best direct clues come from particular places rather than from an island-wide snapshot. In north-central Ireland, organic sediments beneath later tills at Derryvree and Greenagho in County Fermanagh have produced calibrated ranges indicating ice-free conditions until at least about 34,000 years ago. In south-west Ireland, uranium-thorium dating of speleothems from Crag Cave, County Kerry, shows phases of cave-calcite growth between about 38,000–34,000 and 32,000–30,000 years ago. Because liquid water had to percolate through the limestone for such formations to grow, these records strongly suggest that the cave's immediate landscape was not continuously sealed by glacier or permafrost during those intervals.

This is evidence with limits. A cave record is local, and a gap in calcite growth can arise through changes in water supply as well as severe cold. It cannot map every valley, mountain or shore. Yet taken with subglacial landforms, marine cores and later ice-sheet limits, it supports a cautious interpretation: around the requested date, parts of Ireland were likely still exposed or only beginning to be affected by major ice expansion, while the ice sheet was building in the wider British–Irish region. The exact boundary, thickness and timing remain subjects of active reconstruction.

Sea level was far lower globally than today because immense quantities of water were stored in continental ice sheets. This enlarged the continental shelves around Ireland, moving shorelines seawards in many areas. Low sea level did not automatically create a dependable land route from Ireland to Britain or continental Europe; the Irish Sea basin and its changing marine and glacial conditions remained a formidable barrier. Routes that may have existed at particular stages must be demonstrated, not assumed. For people or animals, access to Ireland depended on a shifting combination of water, ice, exposed shelf and local geography.

Animals in a Cold Landscape

Southern Irish caves preserve the most vivid evidence for life near this broad period. Castlepook Cave near Doneraile, County Cork, has yielded a rich but complicated assemblage of Pleistocene animal remains. Modern re-dating has shown that some of its fauna is considerably older than earlier laboratory results suggested. Mammoth, spotted hyaena, giant deer and reindeer are among animals represented in the wider Late Pleistocene record of southern Ireland. These are not merely exotic names: their remains show that, during suitable ice-free episodes, Ireland could support a cold-climate fauna unlike that of the modern island.

However, a bone's discovery in a cave does not necessarily mean that the animal lived or died precisely there. Hyaenas could accumulate prey remains in dens; carnivores, water movement, collapse and nineteenth- or early twentieth-century excavation practices all complicate the deposits. The Castlepook assemblage is especially important because it was collected long ago and lacks the secure, layer-by-layer context expected of modern excavation. It provides compelling evidence for regional animal presence over long spans, but rarely a neatly dated scene.

The likely vegetation cannot be reconstructed tree by tree. During cold phases, open herb-rich grassland, steppe-tundra and sparse shrub communities are more plausible than closed woodland. Plant productivity would have fluctuated with abrupt climatic shifts. Such habitats could sustain grazing animals and their predators where terrain was exposed, but they were harsh places: windswept, seasonally severe and vulnerable to frost action. The giant deer often popularly called the “Irish elk” was not an emblem of a settled Irish landscape; at this date it was one component of a changing Pleistocene fauna whose distribution reached far beyond Ireland.

The Human Question

There is no securely excavated settlement, hearth, stone-tool assemblage, grave, house or artwork from Ireland that can responsibly be assigned to 31,965 BCE. There are no grounds for describing villages, kin groups, languages, religious rites, political authority, diplomacy, trade networks or organised warfare on the island in this particular year. Nor may later Irish traditions, medieval genealogies or modern national identities be projected into the Upper Palaeolithic. They belong to incomparably later worlds.

A recently publicised but still limited clue deserves careful notice. A reindeer femur from the old Castlepook Cave collection has been reported as bearing a cut mark made by a sharp stone tool and as dating to roughly 33,000 BCE. If the modification is confirmed as human-made and its dating and association withstand fuller scrutiny, it would point to a very early, probably brief Upper Palaeolithic human presence in Ireland. It would not establish continuous settlement, a population size, or an event in 31,965 BCE. One modified bone cannot answer those larger questions, particularly when its original excavated context is uncertain.

This caution is not an attempt to dismiss the find. It identifies why it is valuable: it directs future research towards caves, old museum collections and surviving undisturbed deposits. The possibility that hunters reached southern Ireland during a comparatively favourable window is archaeologically significant. They may have followed or encountered reindeer herds and used portable stone tools, as Upper Palaeolithic groups elsewhere in north-west Europe did. But this remains an interpretation informed by neighbouring evidence, not a demonstrated account of life at Castlepook.

The stronger published evidence for human activity in Ireland is much later. A brown-bear kneecap from Alice and Gwendoline Cave, County Clare, bears cut marks and has calibrated dates around 12,800–12,600 years before present, or approximately 10,800–10,500 BCE. Sustained Mesolithic settlement appears later again, from about 8000 BCE. These large chronological gaps are central to the story. They show why a single possible Palaeolithic signal cannot be converted into a continuous national prehistory.

Society, Exchange and Belief: What Cannot Be Seen

For the period around 31,965 BCE, archaeology records environmental opportunity more clearly than human society. There is no Irish evidence for farming, domesticated livestock, metalworking, pottery, monument building, writing, coinage or long-distance exchange. There is likewise no direct evidence for ritual activity. A cave was a geological feature and, in some cases, an animal den; it should not be labelled a sanctuary without human traces that support that conclusion.

If people did visit Ireland during a late Marine Isotope Stage 3 interval, their economy would almost certainly have been based on hunting, gathering and the use of perishable materials, rather than cultivation. That statement is a general inference from Upper Palaeolithic lifeways, not evidence for a

documented Irish camp. Wood, hide, sinew, fibre and food remains rarely survive in exposed glacial landscapes, while subsequent ice movement could remove or rework surface sites altogether. The absence of evidence is therefore shaped both by genuine scarcity and by difficult preservation.

There can be no responsible discussion of Irish political affairs, conflict or diplomacy in the normal historical sense. At most, the wider European context suggests small, mobile human populations whose movements responded to animal migrations, climate and terrain. Whether any such groups crossed into Ireland at this time, how long they remained, and whether they returned, cannot yet be known. The most accurate word is possibility, not certainty.

Legacy Beneath the Modern Island

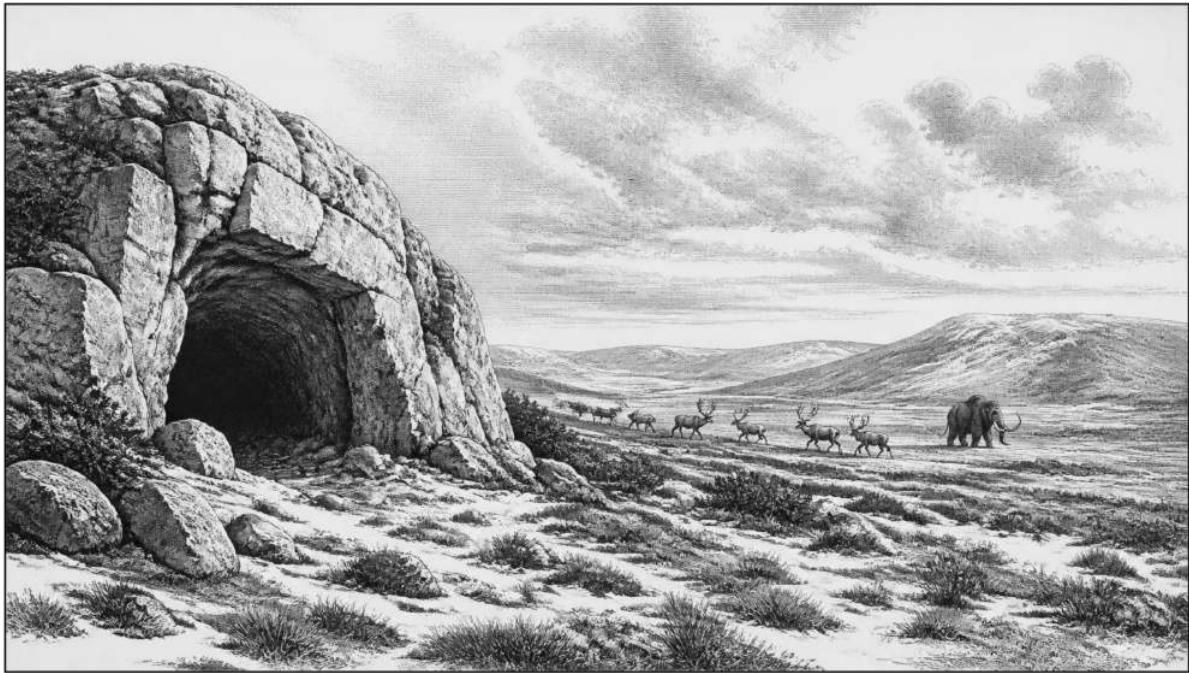
Though no event can be attached to 31,965 BCE, this interval helped create the physical Ireland later inhabitants encountered. Ice-sheet advance and retreat scoured rock, transported sediment, reshaped drainage and contributed to the terrain later occupied by Mesolithic foragers, Neolithic farmers and every subsequent society. Offshore channels and sea-floor landforms retain evidence of ice streams that once linked Irish landscapes to the wider British–Irish Ice Sheet.

The year therefore stands not at the beginning of a straightforward national narrative, but within a deep environmental prehistory. Around 34,000 years ago, Ireland was a cold, unstable and regionally varied place. Parts of it may still have offered exposed terrain and habitat for Pleistocene animals; major glaciation was gathering force; and a reported modified reindeer bone raises, but does not settle, the question of human visitation. That combination of firm evidence and disciplined uncertainty is the most truthful history available for Ireland around 31,965 BCE.

Chapter 037 of 100

31964 BCE

Castlepook Reindeer Toolmarks^[37]



“31,964 BCE” is a useful modern label, not a date that people living in prehistoric Ireland could have recognised. It corresponds only approximately to 33,900 years before the conventional radiocarbon baseline of 1950. At such depth in time, archaeology cannot identify a particular year, season, event or individual. The responsible frame is a broad one: Ireland in the later part of Marine Isotope Stage 3, before the fullest extent of the last ice sheet. Evidence consists chiefly of cave animal remains, their scientific dates, sedimentary records and the changing shape of the surrounding seas and ice. It offers a vivid but fragmentary glimpse of an Ice Age island, not an annual chronicle.

An Island at the Edge of Europe

At around this point in the deep past, Ireland lay at the north-western edge of the European world inhabited by Upper Palaeolithic hunter-gatherers. It was not yet the fully ice-covered landscape associated with the peak of the Last Glacial Maximum, conventionally dated in global terms to about 26,500–19,000 years ago. The last Irish ice sheet expanded and reorganised over a long period, and its extent differed from region to region. Later glacier movement also eroded, buried and dispersed earlier deposits. This is one reason why the Irish record for the period is so much thinner than that of France, Iberia, southern Britain or central Europe.

Lower global sea levels altered coastlines and shallow seas, but they do not licence a simple picture of a permanent dry land bridge from Ireland to Britain or continental Europe. The position of the shoreline, local land uplift and depression beneath ice, marine channels, sea ice and glacier margins changed repeatedly. Mammals did reach Ireland during parts of the Late Pleistocene, demonstrating some form of

ecological connectivity with Britain and the wider European landmass. How any individual animal or person crossed, and whether particular passages were open at any given moment, remains uncertain. Ireland was accessible at intervals, but it was also a marginal and challenging destination.

What Castlepook Can Tell Us

The most relevant place is Castlepook Cave near Doneraile in north County Cork, historically known as Mammoth Cave because of its rich fossil assemblage. Material from the cave has produced evidence for an Ice Age fauna that included woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena. Older excavations, however, recovered many bones without the standards of modern stratigraphic recording. Cave deposits can also be mixed by water, sediment movement, carnivore activity and later digging. A bone from the cave can establish that an animal lived or died within a broad period; it does not necessarily preserve the exact place where the animal was killed, eaten or carried underground.

Radiocarbon programmes and improved pretreatment have shown that some southern Irish cave fauna belongs to the pre-Last Glacial Maximum part of the Late Pleistocene. Earlier conventional radiocarbon determinations from Castlepook were revised as methods improved, a reminder that deep-time chronologies require continuing scrutiny. Scholarship therefore uses calibrated ranges, rather than treating an uncalibrated laboratory age as a calendar date. For Ireland around 34,000 calibrated years before present, the secure conclusion is that sizeable mammals had occupied the island during this broad climatic phase; their local populations may have appeared, retreated or vanished as habitats and access routes changed.

A reindeer femur from Castlepook has particular public importance. It has been reported as dating to about 31,000 BCE and as bearing deep marks interpreted by Ruth Carden as consistent with cutting or chopping by a stone tool. If that interpretation is confirmed, it would be evidence that people processed a reindeer in Ireland far earlier than the formerly accepted late-glacial evidence for human activity. It is an arresting possibility, and it makes Castlepook directly relevant to this date. Yet the claim must be stated at its proper scale. The bone is not a securely excavated occupation surface, and no associated stone-tool assemblage, hearth, dwelling, burial or human remains of comparable antiquity has been recovered there.

A Faunal Landscape, Not a Settled Country

The animal record allows a cautious reconstruction of the kind of environment available in parts of Ireland. Reindeer, mammoth and giant deer point towards open, cold-climate habitats rather than the dense broadleaf woodland familiar from later prehistoric Ireland. A mosaic of grassland, herb-rich steppe-tundra, sparse scrub and sheltered valleys is more plausible than a single uniform landscape. Seasonal conditions, soils, altitude and proximity to ice would have produced strong regional variation. The cave fauna also indicates a food web with predators and scavengers: spotted hyaenas could transport and gnaw bones into their dens, while wolves and brown bears belonged to the wider Pleistocene ecological setting.

These fossils do not prove that every species lived together at Castlepook in 31,964 BCE, nor do they measure herd sizes. They reveal a long-lived and changing record accumulated over millennia. It would be equally misleading to imagine modern Irish pasture, bog and hedgerow transplanted into this time. The island's later green, wooded appearance was the product of post-glacial warming, soil development and, much later, farming. Here the dominant historical force was climate: repeated cold phases, expanding ice and shifting coastlines set the limits within which plants, animals and any visiting people could survive.

People: A Fleeting Possibility

If the Castlepook marks were made by humans soon after the reindeer died, the likely actors were a very small, mobile Upper Palaeolithic foraging party, not a settled population. Reindeer offered meat, marrow, fat, hide, sinew, antler and bone, making a carcass a valuable resource. A single butchered limb bone could represent one episode of carcass processing after a hunt, scavenging event or journey across a difficult landscape. It cannot show whether the people camped nearby, how long they stayed, which route they used or whether they returned.

Nothing presently justifies naming an Irish tribe, language, leader or cultural group for this date. The people potentially represented at Castlepook should not be called “Irish” in the later ethnic, linguistic or national sense. Nor can Irish evidence tell us their clothing, family structures, gender roles or social hierarchy. Upper Palaeolithic communities elsewhere in Europe made sophisticated stone tools, ornaments, images and ritual deposits, but those discoveries cannot simply be imported into Ireland. They provide a continental context for what humans were capable of; they are not proof of equivalent practices on this island.

No Politics, No Diplomacy, No Written Memory

Political history cannot responsibly be written for Ireland in this period. There is no evidence for kingship, territorial states, named communities, law, diplomacy, organised warfare or alliances. Nor are there grounds to infer trade networks. A group moving through the Irish landscape might have carried portable stone tools or raw materials, but no Irish assemblage of this age demonstrates exchange, ownership systems or regular long-distance commerce. Economy, in the limited sense available here, means subsistence: the possible use of animal carcasses and the practical challenge of obtaining food, warmth and shelter in a volatile climate.

Religion, learning and culture are similarly beyond direct recovery. No Irish monument, grave, painted cave, engraved object, musical instrument or formal ritual site can be assigned to around 31,964 BCE. Caves later became important places in many Irish prehistoric traditions, but Castlepook must not be given a ceremonial role merely because it is a cave. Its demonstrated importance at this age is palaeontological. The absence of material evidence is not proof that people had no beliefs, stories or knowledge of the landscape; it means that archaeology cannot describe them here.

Approaching the Glacial Maximum

The longer-term development matters more than any imagined event in this nominal year. In the millennia after this period, worsening cold and the growth of the British-Irish Ice Sheet transformed much of Ireland. At its later maximum, ice extended across broad areas of the island and onto adjacent continental shelves. Some uplands may have supported cold-based ice or stood above erosive ice as nunataks, while fast-flowing outlets carried ice towards the Irish Sea and Atlantic margins. Glacial erosion removed or disturbed many earlier terrestrial surfaces, helping to explain why evidence for people before the final deglaciation is exceptionally rare.

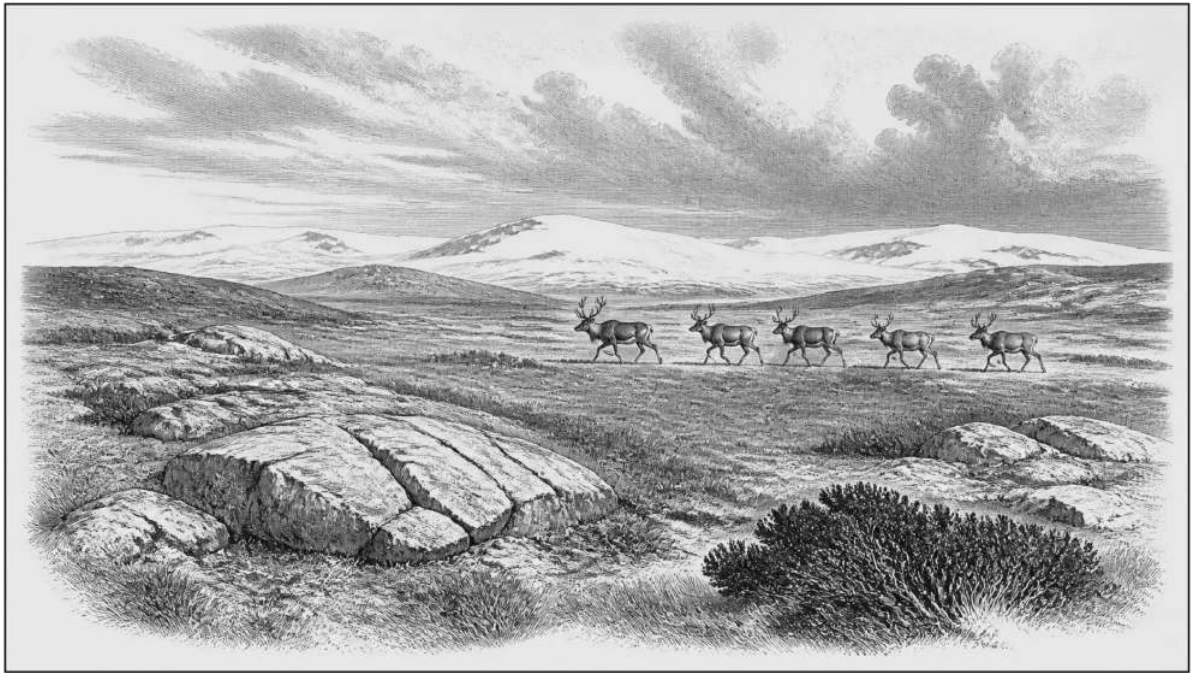
Thus Ireland around 31,964 BCE should be understood as a place of ecological opportunity but profound instability. Mammals had reached it, and a reported reindeer bone raises the possibility that humans did too. The strongest evidence concerns Ice Age fauna and environmental change; the human

story remains a question rather than a settled narrative. Far from being an empty prelude to later history, this was a formative landscape in which ice, sea, animals and intermittent connections to Europe determined what could happen next.

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31963 BCE

Derryvree Interstadial Deposits^[38]



“31,963 BCE” is a modern way of labelling a point so remote that it cannot be treated as a dated year in the historical sense. It corresponds only approximately to 33,900 calibrated years before AD 1950 (cal BP). Neither an Irish written record nor an archaeological sequence can identify an event, a person, a season, or even a securely bounded generation at this point. The responsible subject is therefore not an imagined community in a named year, but Ireland in the later part of Marine Isotope Stage 3: a cold, unstable phase of the Late Pleistocene, before the Last Glacial Maximum reached its full intensity.

Dating an Uncertain Moment

At this depth of time, dates are expressed as ranges because radiocarbon measurements need calibration and because deposits are not clocks with annual resolution. The International Calibration Curve defines “BP” as before AD 1950 and shows why conventional radiocarbon ages must be converted into calendar-age ranges rather than simply translated into BCE dates. The date 31,963 BCE should consequently be read as “around 34,000 calendar years ago”, not as 1 January of a prehistoric year.

That distinction matters especially in Ireland. Organic deposits beneath later glacial sediments at Derryvree and Greenagho, County Fermanagh, provide evidence for intervals without overriding ice in north-central Ireland. Their calibrated ranges include c. 36.9–31.7 thousand and c. 37.2–35.7 thousand years ago respectively. They do not describe the entire island at one instant, but they show that the last major Irish ice sheet did not simply cover Ireland continuously throughout this earlier period.

A Changing Ice-Age Landscape

Ireland lay within the North Atlantic climatic system, where abrupt shifts in temperature, precipitation, sea ice and glacier growth repeatedly changed the character of the land. The island was not yet in the fully developed Last Glacial Maximum familiar from popular images of an ice-smothered Ireland. Recent ice-sheet synthesis reconstructs the growth and retreat of the British–Irish Ice Sheet from 31,000 to 15,000 years ago, while other evidence indicates that much of the Irish ice mass expanded from comparatively limited cover after about 34,000 years ago and reached the southern coast only much later.

For around 31,963 BCE, therefore, the most defensible picture is not a single neat ice margin. Parts of Ireland may have supported periglacial landscapes: seasonally frozen ground, sparse vegetation, exposed rock and sediment, and strong cold-weather processes. Other areas may have been affected by local or expanding ice. In south-west Ireland, uranium-series dating of stalagmites in Crag Cave records episodic cave formation during milder Greenland Interstadials, indicating that conditions could become sufficiently temperate and unfrozen for water to percolate through limestone. Such evidence captures regional environmental change over millennia, rather than proving the weather in a particular year.

Sea level was far lower than it is today because immense volumes of water were locked in global ice sheets. Yet lower seas do not permit a simple claim that Ireland was definitely joined to Britain or the European mainland at this exact point. Coastlines, river courses, ice lobes and shallow seas altered repeatedly. The routes available to animals—and potentially to people—must be inferred from changing palaeogeography, not assumed from a modern map.

Animals, Caves and Fossil Evidence

The strongest direct evidence for Ireland at this timescale is palaeontological. Cave collections, particularly in the south and west, show that a varied Pleistocene mammal fauna entered Ireland during the long interval from at least about 45,000 to 20,000 years ago. The documented pre-Last Glacial Maximum fauna includes woolly mammoth, giant deer, reindeer, horse, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. These species should not be imagined as a fixed list occupying every county simultaneously: their ranges shifted with climate, vegetation and access routes.

Castlepook Cave near Doneraile, County Cork, is particularly important because it preserves pre- and post-Last Glacial Maximum faunal material. Improved pretreatment and redating have revised some older results substantially, suggesting that giant deer and spotted hyaena there may have disappeared locally before the Last Glacial Maximum, around 40,000 cal BP. This is a useful warning against turning a fossil assemblage into a snapshot of 31,963 BCE. It does, however, establish a wider ecological world in which large herbivores, predators and scavengers could inhabit parts of Ice-Age Ireland during favourable intervals.

Such fauna implies open or broken habitats rather than the dense temperate woodland that would cover much of Ireland in later millennia. Grazing animals and their predators depended on mosaics of grassland, herb-rich ground, scrub and sheltered terrain. The exact balance of plants is difficult to recover, and fossil finds are concentrated in caves rather than evenly distributed across the landscape. Nevertheless, the evidence decisively corrects any assumption that prehistoric Ireland was always an ecological backwater: it was periodically part of a broader north-west European zone of animal movement.

People: No Demonstrated Community

There is no securely demonstrated settlement, hearth, tool-making floor, burial, dwelling or human bone from Ireland around 31,963 BCE. It is therefore not responsible to describe an Irish tribe, language, leader, family system, hunting camp or migration in this year. Nor can archaeologists identify political affairs, diplomacy, organised conflict, trade networks or religion in Ireland at this date. Those are not merely unknown details; the evidence needed to establish that people were present at all has not been recovered.

The currently published direct indication of Upper Palaeolithic human activity in Ireland is vastly later. A brown-bear kneecap from Alice and Gwendoline Cave, County Clare, bears cut marks interpreted as stone-tool butchery and has been independently dated to c. 12,810–12,590 cal BP, equivalent to roughly 10,860–10,640 BCE. That evidence is important, but it cannot be projected backwards more than twenty millennia to populate Ireland in 31,963 BCE.

Older claims and suggestive finds demand particular caution. The National Museum of Ireland notes that the Mell flint flake in County Louth was made elsewhere and later transported by ice, rather than showing an early Irish occupation. Cave deposits also pose formidable problems: nineteenth- and early twentieth-century excavations often disturbed layers, and burrowing animals, erosion and later human use can mix material of widely different ages. Re-examination, direct dating of individual bones, microscopy of surface marks and careful reconstruction of old excavation records are therefore central to the modern study of Ireland's deep past.

What Regional Comparison Can—and Cannot—Add

Across continental Europe, *Homo sapiens* communities of the Upper Palaeolithic produced sophisticated stone and organic tools, ornaments, images and long-distance social connections. In Britain, archaeological evidence confirms human presence in periods that demonstrate northern environments could be occupied when climate and resources allowed. But regional comparison is context, not proof. There are no Irish artefacts of Gravettian age, no Irish cave art securely dated to around 34,000 years ago, and no basis for attaching a continental archaeological culture to Ireland itself.

If people ever made short visits to Ireland during this phase, they left no accepted material trace from which their economy or beliefs can be reconstructed. If none came, the animal record still matters: the island's ecology was being shaped by the same climatic fluctuations, lowered sea levels and changing passages that conditioned human movement elsewhere. Either possibility underscores a central feature of the period—Ireland's future human history was being prepared environmentally long before durable settlement can be demonstrated.

The Long View

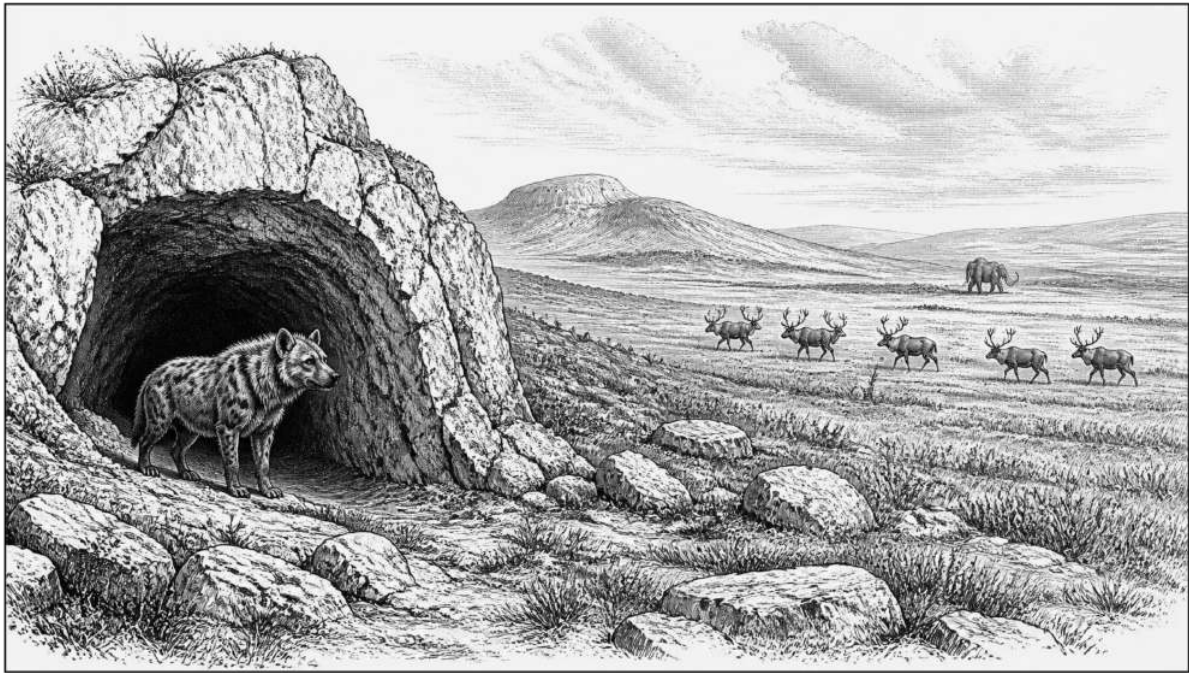
The later Last Glacial Maximum would transform the island more drastically. At its greatest extent, the British–Irish Ice Sheet covered most of Ireland and adjacent shelves, eroding, burying and rearranging older landscapes. This geological destruction helps explain why evidence for earlier people is so scarce, but absence of evidence is not positive proof that no individual ever arrived. It does mean that sustained occupation at 31,963 BCE remains unproven.

For Ireland around this nominal year, the history is thus one of climate, ice, land and animals rather than kingdoms or named ancestors. The best-supported conclusion is modest but compelling: parts of the island lay in a severe, rapidly changing Ice-Age environment, still capable at intervals of supporting distinctive Pleistocene fauna, while the evidence does not yet justify placing a known human community there.

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31962 BCE

Herb-Rich Tundra^[39]



31,962 BCE is a modern label, not a date at which an event can be identified in Ireland. Archaeology cannot resolve a particular calendar year this far back. In terms more meaningful to Quaternary science, the date falls roughly 33,900 years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), a long, climatically unstable interval before the height of the last glaciation. The evidence available for Ireland consists principally of cave bones, sediments, landforms and laboratory dates, not chronicles, settlements or named peoples. It can illuminate an Ice Age landscape; it cannot furnish a year-by-year history in the ordinary sense.

An Island in a Changing Ice Age

Ireland at this broad point in time was not the uniformly ice-covered land often imagined from the phrase “Ice Age”. The fullest expansion of the last Irish Ice Sheet, conventionally placed around 27,000–23,000 calibrated years ago, lay later. Research on sub-till organic deposits suggests that much of Ireland was ice-free until about 32,000 years ago, though the growth and extent of the ice sheet varied between regions and remain the subject of active investigation. A date around 33,900 cal BP therefore belongs to the period immediately before, or during the early stages of, the major advance that would transform the island’s surface.

That does not mean a mild or stable country. MIS 3 contained sharp climatic oscillations recorded especially clearly in Greenland ice cores and in marine sediments. Ireland lay on the north-western edge of Europe, exposed to Atlantic weather and vulnerable to shifts in temperature, precipitation and ice-sheet growth. Open grassland, herb-rich tundra, patches of shrub vegetation and bare or thinly vegetated ground are more defensible images than the familiar wooded “Emerald Isle”. The precise mixture altered over

centuries and millennia, and it cannot be reconstructed for one chosen year. Nor should a modern coastline be projected backwards without qualification: lower global sea levels and changing ice loads altered shores, river courses and the extent of land now submerged beneath the Irish and Celtic Seas.

Glacial geology preserves the large-scale consequences. Ice later eroded bedrock, laid down till, reshaped valleys and displaced or destroyed older deposits. This matters profoundly for archaeology. A sparse record may indicate that few people came to Ireland, but it also reflects the survival problem: any camps on exposed lowlands, river terraces or former coastal plains were vulnerable to ice, water and later landscape change. Caves are exceptional because they sometimes protected bones and sediments from complete removal. They are not neutral archives, however. Animals dragged carcass parts into them, water moved deposits, and many Irish caves were excavated before modern recovery and recording standards existed.

Castlepook and the Evidence of Animals

The key locality for this period is Castlepook Cave near Doneraile, County Cork. Geological Survey Ireland describes it as Ireland's richest known site for vertebrate fauna leading up to the Last Glacial Maximum. Its collections and deposits have produced remains attributed to woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. This is substantial evidence that, during warmer phases before the glacial maximum, parts of Ireland could support a varied cold-stage mammal community. It is not evidence that every one of these animals stood together in the same valley in 31,962 BCE: cave assemblages often accumulate over long periods, and individual bones require direct dating and taphonomic study.

The fauna nevertheless gives the year its proper setting. Reindeer imply open country and seasonal movement; lemmings and Arctic fox point towards severe, northern conditions; mammoth and giant deer indicate the capacity of the wider landscape to sustain very large grazers and browsers. Spotted hyaena is especially revealing. A hyaena den could bring bones from the surrounding countryside into a cave, gnawing and scattering them in the process. Thus, a concentration of mammoth or deer remains is not automatically a hunting site, a human meal or even a natural death-place. It may instead record predation and scavenging by carnivores.

Older radiocarbon work dated some Castlepook material to the middle of the last glacial cycle, including a mammoth bone with a result around 33,400 radiocarbon years BP. More recent scholarship has stressed that many Irish cave dates produced before improved collagen pretreatment and ultrafiltration should be reassessed rather than treated as final. The responsible conclusion is broad but important: Castlepook preserves evidence for an MIS 3 Ice Age fauna in southern Ireland, while the exact ages and relationships of particular specimens remain under refinement.

A Possible Human Trace, Not a Settlement

A reported reindeer femur from Castlepook has particular relevance to this nominal year. County Cork heritage publications identify it as a Palaeolithic specimen, approximately 31,000 BC, with a mark interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone tool during butchery. If the interpretation and chronology are sustained through full specialist publication and further analysis, it would be powerful evidence that a person, or a very small group, handled a reindeer in Ireland during the Upper Palaeolithic. It would push the island's known human story far earlier than the long-accepted record.

Yet this must not be enlarged into an invented community. The bone is not a house, hearth, tool-kit, burial ground, artistic tradition or continuously occupied camp. No securely associated Palaeolithic stone-tool assemblage has been recovered from Castlepook. A cut mark must also be distinguished from damage caused by carnivore teeth, sediment movement, excavation or handling; identifying it requires microscopic and comparative taphonomic judgement. Furthermore, a date obtained from the bone establishes when the animal lived or died, not automatically the date of any mark if the find context is disturbed. The cave's long history of water action, animal activity and earlier excavation increases the need for caution.

This uncertainty is not a reason to dismiss the find. It is precisely why it is historically valuable. It directs research towards the possibility of fleeting Upper Palaeolithic visits to Ireland—perhaps hunters following animal movements, perhaps people using exposed coastal and shelf landscapes that no longer survive above water. It does not presently prove permanent colonisation. The National Museum of Ireland still describes unambiguous human presence in the Irish Palaeolithic as unresolved, while the better-established evidence for people comes much later, after deglaciation, in the Late Upper Palaeolithic and Mesolithic.

Society Beyond the Evidence

There is no responsible basis for describing political affairs, diplomacy, leaders, tribal territories or warfare in Ireland in 31,962 BCE. There are no written records, no known human graves of this age in Ireland, and no demonstrable settlements from which social organisation can be reconstructed. Nor is there direct Irish evidence for religion, formal ritual, language, music, visual art or teaching. Upper Palaeolithic communities elsewhere in Europe made sophisticated stone and organic tools, ornaments, images and structured use of caves; those achievements show what contemporary *Homo sapiens* were capable of, but analogy cannot turn continental culture into an Irish fact.

The same boundary applies to everyday economy. If people did enter Ireland, the reindeer femur makes animal processing a plausible activity, not a documented subsistence system. A small visiting party might have hunted, scavenged or butchered a carcass encountered in the landscape; the evidence cannot decide between these possibilities. There is no sound basis to claim farming, herding, pottery, metalworking, trade networks or organised exchange. The most that can be said is that any human presence would have depended closely on mobile animal resources, local stone, shelter and knowledge of a difficult seasonal environment.

Crossings and connections also remain uncertain. Sea level was lower than today, exposing additional shelf land and altering the geography of the Irish Sea. Researchers have debated whether temporary links, islands or ice routes ever assisted movement between Ireland and Britain. The evidence does not justify a confident route for people or animals at this particular time. Ireland's position at Europe's western margin would nevertheless have made any arrival environmentally and logistically significant. A brief incursion is more consistent with the present evidence than a populous, enduring settlement.

Approaching Transformation

The great historical development around this date was therefore environmental rather than political: the approach of the Last Glacial Maximum. Over the following millennia, the Irish Ice Sheet expanded, in some reconstructions covering almost all of the island and extending onto the surrounding shelves. Faunal

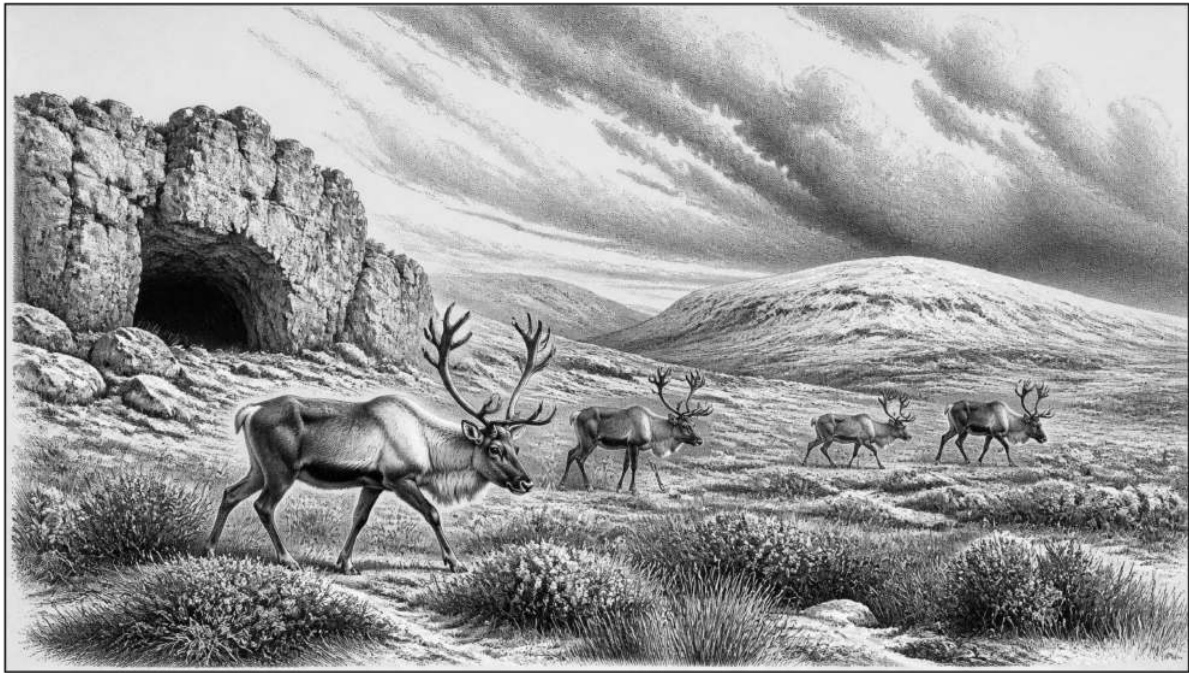
communities contracted, shifted or disappeared locally; later glaciation interrupted the terrestrial record. The eventual retreat of the ice opened a very different chapter, allowing plants, animals and later hunter-gatherers to recolonise landscapes newly released from ice.

For 31,962 BCE, Ireland should be understood as a place of cold-climate ecosystems, mobile animals, unstable climate and fragmentary evidence. Castlepook Cave offers a rare window onto that world and a tantalising, still qualified possibility of human activity. The durable fact is not a named event on a precise day. It is that Ice Age Ireland was ecologically inhabited and geographically changing, while its earliest possible visitors left—at most—traces so slight that each mark on bone and each recalibrated date can alter the story.

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31961 BCE

Castlepook's Marked Bone^[40]



31,961 BCE is a modern calendar label, not a year that can be recovered from Irish archaeology. No person living then recorded it, and no Irish deposit can presently be dated with calendar-year precision. In archaeological terms, it falls broadly in the Late Pleistocene, within Marine Isotope Stage 3 (MIS 3), at roughly 34,000 calendar years before 1950. Such conversions must be handled carefully: radiocarbon years, calibrated calendar ranges and BCE dates are not interchangeable without uncertainty. The responsible question is therefore not what happened in Ireland in one exact year, but what evidence can illuminate the island during this cold and changing interval.

A Landscape in Transition

Ireland stood on the north-western edge of Upper Palaeolithic Europe, in a climate far colder and less stable than today's. The great Last Glacial Maximum, when the British–Irish Ice Sheet became most extensive, still lay ahead, conventionally placed broadly between about 27,000 and 21,000 years ago. Yet recent reconstructions show that the growth of the ice sheet was neither simple nor simultaneous everywhere. Ice had begun to advance in parts of the wider British–Irish system during the later stages of MIS 3, while other areas could remain exposed or experience shifting ice margins. Around the date represented here, Ireland should be envisaged not as a uniformly buried white continent, nor as familiar green pasture, but as a severe, regionally varied Ice Age landscape approaching major glaciation.

Glaciers, frost action, meltwater and later erosion have profoundly altered that older landscape. This matters because the absence of camps, hearths or tools is not straightforward proof that people never entered Ireland. Ice sheets can scour and rearrange deposits; rising seas and changing coastlines can hide former lowlands; caves preserve only selected materials. Nevertheless, archaeology must distinguish

between what may have been destroyed and what has actually been found. For 31,961 BCE, the surviving evidence is chiefly geological and palaeontological rather than the remains of a known human community.

Caves and Animal Evidence

Southern Irish cave collections provide the clearest window into the island's pre-Last Glacial Maximum fauna. Castlepook Cave near Doneraile in north County Cork is particularly important. Excavations conducted principally in the early twentieth century recovered many animal bones, although the original methods did not meet modern stratigraphic standards and much of the collection has been lost. Subsequent research and redating have shown that Irish caves retain evidence of mammals living on the island between at least about 45,000 and 20,000 years ago. That is a very wide span, so an assemblage must not be treated as a photograph of one moment.

The known pre-LGM fauna includes reindeer, giant deer, red deer, brown bear, wolf, Arctic fox, mountain hare, lemmings, horse, spotted hyena and woolly mammoth. These names evoke a rich Ice Age ecosystem, but they do not establish that every species occupied Castlepook, or Ireland as a whole, at precisely 31,961 BCE. Bones accumulated through different episodes, and carnivores, water, sediment movement and excavation could mix them. Still, their presence shows that parts of Ireland could support substantial animal life during MIS 3. Reindeer and lemmings indicate cold-adapted conditions; mammoth and horse belong to open-country communities; predators reveal food chains rather than an empty wilderness.

The likely vegetation was correspondingly open. Treeless or sparsely wooded tundra-steppe, grasses, herbs, sedges and low shrubs would have offered seasonal grazing and browsing, while exposed rock, rivers, wetlands and sheltered valleys created local variation. It would be misleading to imagine an unchanging polar desert. Climate in MIS 3 shifted repeatedly over centuries and millennia, and animal ranges followed resources, snow cover and ice margins. The physical setting was dynamic: a route usable by grazing animals in one phase might have been blocked by sea, ice or difficult terrain in another.

The Question of People

The date is especially interesting because Castlepook has been associated with a reported reindeer bone bearing a mark interpreted as the result of cutting with a sharp stone tool. Public accounts have presented this as evidence of human activity around 33,000 years ago, approximately the period under discussion. The bone is important enough that a Royal Irish Academy-funded project has sought new excavation, museum study and securely contextualised evidence from the cave. But the claim must remain carefully framed: the specimen derives from an old collection, not an excavated living surface with tools, a fireplace and dated sediment preserved together.

A mark on one animal bone, even if confirmed as a cut mark, records a limited action on a carcass. It does not demonstrate a permanent settlement, a family group, a named people or a continuous population. No securely dated Irish house, hearth, stone-tool assemblage, burial, cave art or workshop of this age has yet been established. Earlier descriptions of the Castlepook collection even stressed the lack of recognised human traces in the material then studied; the subsequently reported modified bone is therefore a potentially significant but still isolated clue. The distinction between direct evidence and interpretation is crucial.

The earliest widely published direct evidence for a human presence in Ireland remains much later: a butchered brown-bear patella from Alice and Gwendoline Cave, County Clare, radiocarbon dated to about 12,800–12,600 calibrated years before present, roughly 10,800–10,500 BCE. That find demonstrates Late Upper Palaeolithic activity after the main glaciation, but cannot be used to fill the much earlier gap at Castlepook. It does, however, show why individual bones, examined with modern dating and microscopic methods, can transform a long-held chronology.

Connections Without a Known Community

Elsewhere in Europe, humans were certainly present. Around 34,000–24,000 years ago, archaeologists recognise a varied set of hunter-gatherer traditions often grouped under the Gravettian technocomplex. These were not one people or state: recent work emphasises regional cultural diversity across Europe. Northern European sites demonstrate sophisticated stone technologies, hunting practices, ornaments and social networks. None of this can responsibly be assigned to Ireland, because no Irish tool assemblage of this date links the island to a Gravettian group. It supplies context for the possibility of visitors, not an Irish cultural label.

Nor can a definite route into Ireland be reconstructed. Sea level was lower than today and coastlines were different, but lower water alone does not prove a walkable land bridge between Ireland and Britain. The Irish Sea basin, changing ice fronts and hazardous coasts made access a complex geographical problem. Any humans who reached the island may have travelled over a combination of exposed terrain, ice-edge environments and short sea crossings, but that is inference rather than evidence. No trade goods, imported raw materials or repeated route markers show organised exchange at this time.

No Politics, But Real Survival

There is no evidence from which to reconstruct political affairs, diplomacy, warfare, leadership, language, kinship rules or territorial boundaries in Ireland in 31,961 BCE. It would be anachronistic to invent tribes, kingdoms or “first Irish” identities. If hunters briefly visited, their immediate concerns may have included tracking animals, sheltering from weather, maintaining stone cutting edges and sharing food. Yet even these are informed possibilities drawn from wider Upper Palaeolithic life, not observations of an excavated Irish camp.

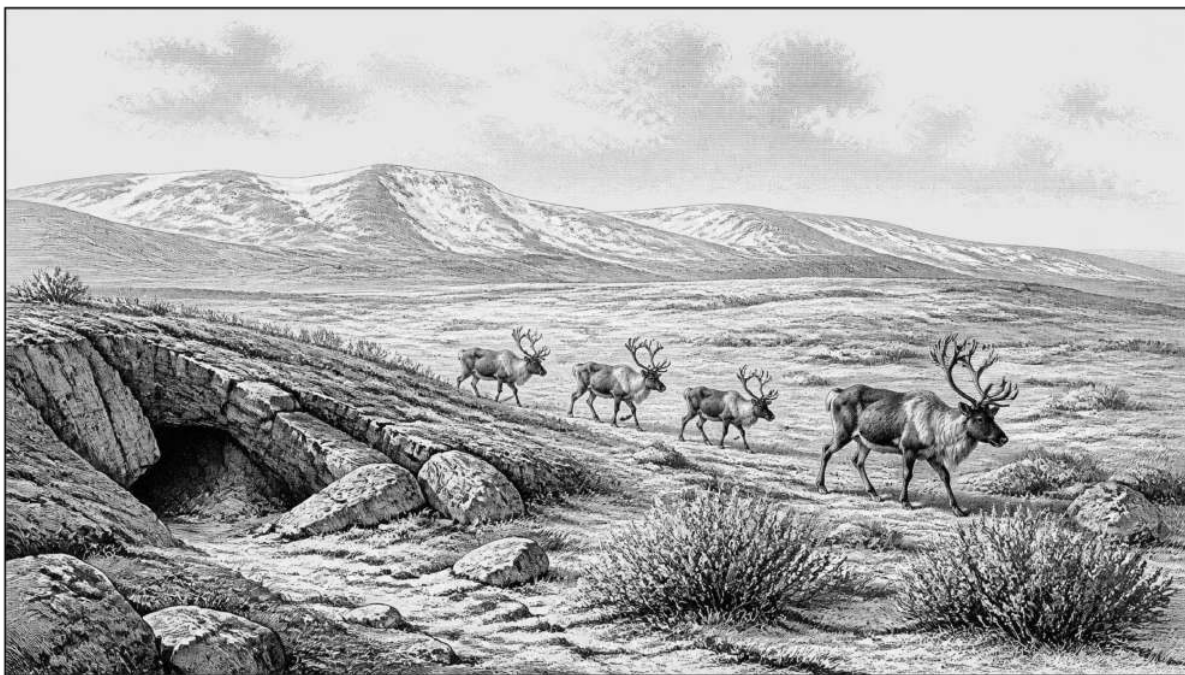
Religion, formal learning and artistic practice are equally beyond recovery in Ireland at this date. The absence of Irish cave art or ritual deposits should not be interpreted as proof that visitors had no beliefs or cultural knowledge; it means only that no such material has survived or been recognised. A proposed butchery mark may suggest practical processing of an animal, perhaps reindeer, but it cannot reveal a ceremony, myth or teaching tradition. Archaeological restraint is not a failure of imagination: it is what allows the sparse record to remain meaningful.

The major development represented by this period is environmental rather than political. Ireland was part of a northern world in which animal populations moved through cold open habitats while the British–Irish Ice Sheet expanded and reshaped the land. The possible Castlepook human trace gives this setting unusual historical significance, but it should be seen as a question under active investigation rather than a settled origin story. The National Museum of Ireland’s fossil collections, renewed cave excavations and improved radiocarbon methods may yet sharpen the picture. For now, 31,961 BCE belongs to Ireland’s deep prehistory: an Ice Age world securely attested by geology and fauna, with only the faintest, tantalising possibility of human footsteps beside it.

Chapter 041 of 100

31960 BCE

Exposed Celtic Sea Shelf^[41]



Modern calendar-year precision is not available for Ireland in 31,960 BCE. The label is a convenient modern conversion, not a date that anyone then recognised or that archaeological science can isolate to a single year. It corresponds roughly to 33,910 years before the conventional radiocarbon “present” of 1950, within the Late Pleistocene and Marine Isotope Stage 3. At this depth of time, evidence is dated in calibrated ranges, often spanning centuries or millennia; cave deposits can also be mixed by water, animals and earlier excavations. The responsible question is therefore not what happened in an Irish year, but what the surviving evidence can tell us about Ireland around this broad interval.

An Ice-Age Landscape

Ireland was entering a severe late phase of the last Ice Age, but it was not yet at the full Last Glacial Maximum. The British–Irish Ice Sheet expanded dramatically during the later part of Marine Isotope Stage 3, while its greatest overall extent came later, broadly between about 27,000 and 23,000 years ago. Reconstructions are necessarily regional rather than year-specific: ice margins advanced and retreated unevenly, and conditions differed between western uplands, southern lowlands and the basins now submerged beneath the Irish and Celtic Seas. It would be misleading to picture every part of the island in 31,960 BCE as a single, permanent white ice cap. Equally, it would be wrong to imagine a mild, wooded Ireland. This was a cold, exposed northern landscape increasingly affected by ice growth, frost action and powerful seasonal change.

Sea level was far lower than it is today because vast quantities of water were held in continental ice sheets. The coastline and surrounding shelves were consequently very different, with land now underwater exposed in places. Yet lower sea level does not prove that people could simply walk from

Britain or continental Europe into Ireland. The geography of the Irish Sea region changed through time, and rivers, sea channels, ice, marshy ground and glacial barriers may all have obstructed movement. No securely mapped route can be assigned to this particular date. The most that can safely be said is that Ireland was less isolated geographically than the modern island, while still being a difficult and changeable north-western edge of Europe.

Castlepook and Its Animals

The crucial Irish evidence for this distant period comes not from villages or monuments, but from cave bone assemblages. Castlepook Cave, near Doneraile in north County Cork, is especially important. Early twentieth-century excavations led by Richard J. Ussher recovered an exceptionally large collection, although only a fraction survives and the original excavation standards cannot meet modern expectations. Geological Survey Ireland describes Castlepook as Ireland's richest known archive for vertebrate life in the period leading towards the Last Glacial Maximum. Direct dating and reassessment have placed individual bones from the cave within a very long span, rather than within one single occupation horizon.

Its fauna provides the clearest glimpse of the wider environment. Remains attributed to woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena show that, during parts of the middle and later Ice Age, southern Ireland supported a strikingly varied large-mammal community. Wolves, Arctic foxes, mountain hares and lemmings occur in later cold-phase material. Such animals should not be assembled into an imagined parade on one day in 31,960 BCE: their bones were accumulated over long periods, and the presence of a species in a cave does not establish that every species lived together or in every Irish region. Nevertheless, reindeer and mammoth point towards open, treeless or sparsely vegetated habitats, while hyaena indicates a carnivore guild far removed from modern Irish ecology.

The cave itself was not necessarily a human home. Carnivores could drag carcass parts underground; scavengers, flowing water and collapsing sediment could later redistribute them. Recent work at another Irish cave, Alice and Gwendoline Cave in County Clare, has demonstrated just how important such processes are: analysis there found that much bone-bearing sediment had entered through runoff or slope movement rather than preserving an intact floor of human activity. This is a valuable warning for Castlepook. Cave bones are powerful evidence for animals and climate, but they are not automatically evidence for a campsite, a hunting stand or a household.

A Possible Human Trace

One reindeer femur from Castlepook has made this period especially significant. It has been reported as bearing a deep mark interpreted by Ruth Carden as having been made with a sharp stone implement during butchery, and has been presented in County Cork heritage publications as evidence for human activity around 31,000 BCE. If that interpretation is correct, it would indicate that Upper Palaeolithic hunter-gatherers reached Ireland many millennia earlier than the previously accepted Mesolithic settlement record. It would not, however, demonstrate a settled population, a named people or a continuous occupation. The bone may represent a brief visit by a small mobile group, and the carcass remains may subsequently have been taken into the cave by carnivores.

The qualification matters. No associated stone-tool assemblage, hearth, dwelling floor, grave or repeated series of securely excavated Palaeolithic camps has yet been found in Ireland for this early interval. Castlepook's surviving material derives largely from antiquarian work, and modern investigation has concentrated on determining whether undisturbed Pleistocene deposits survive. Archaeologists are

therefore right to distinguish a plausible, potentially transformative trace of butchery from proof of a resident community. The difference is not pedantry: a cut-marked bone can establish contact between people and an animal, but it cannot independently tell us how long people stayed, how many came, where they slept or whether they returned.

People Without a Recorded Society

For political affairs, conflict and diplomacy, the evidence is silent. There were no states, borders, written agreements or named leaders that can be recovered from Ireland around this date. If people entered the island, they would have belonged to small, highly mobile Upper Palaeolithic hunting and gathering groups, comparable in broad economic character to communities elsewhere in north-west Europe, not to later Irish tribes or kingdoms. Their social relationships, languages, kinship systems and decision-making structures remain unknown. It is possible that access to animal herds, sheltering places and safe travel routes caused cooperation or competition, but there is no Irish evidence from which to identify a conflict, alliance or territorial boundary.

Everyday life is similarly visible only by inference. A party capable of butchering a reindeer would have needed sharp stone edges and detailed practical knowledge of animal bodies, weather and movement across unfamiliar terrain. Reindeer meat, fat, hide, sinew and bone could all have been valuable. Yet no Irish material allows us to say how the animal was hunted, whether it was killed by people or found dead, how much of it was carried away, or whether its hide became clothing or shelter. Flint and other workable stone may have been transported across substantial distances by mobile groups, but there is no demonstrated trade network in Ireland at this date. The safest description is one of possible short-term subsistence activity, not an established economy.

Culture, Belief and Absence

There is no responsible basis for reconstructing religion, art, formal learning or ritual in Ireland in 31,960 BCE. The wider Upper Palaeolithic world certainly produced sophisticated stone technologies, portable art and cave imagery, but none of that permits those practices to be projected onto Ireland. Nor should later Irish mythology, medieval traditions or the island's celebrated megalithic monuments be carried backwards into this remote era. At Castlepook, the evidence presently concerns animals, landscape processes and one disputed or cautiously interpreted human modification, not symbolic culture.

That absence is historically meaningful. It reflects both the likelihood that any human presence was brief and the destructive force of later glaciation. Advancing ice, meltwater and repeated freeze-thaw processes eroded or buried much of the earlier landscape. Camps on exposed ground would have been especially vulnerable, while cave deposits have their own complicated histories. Future excavations, refined dating, microscopic study of cut marks, ancient environmental DNA and sediment analysis may alter the picture. For now, Ireland around 31,960 BCE is best understood as a harsh but intermittently habitable Ice-Age frontier: rich enough in animals to attract mobile hunters, yet represented by evidence too sparse to turn a possible visit into a settled prehistoric society.

Chapter 042 of 100

31959 BCE

Mammoth Cave Fauna^[42]



31,959 BCE is a modern chronological label, not a year that can be isolated in Ireland's archaeological record. There were no calendars, written records, named leaders or dated events on the island at this depth of time. Expressed in the convention used by Quaternary scientists, the label falls roughly 33,900 calendar years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 of the last Ice Age. That conversion should not be mistaken for an exact archaeological date: radiocarbon results require calibration, are normally presented as probability ranges, and cannot identify what happened in a particular season or year. The responsible history of Ireland at this point is therefore a history of landscapes, animal remains and a small, contested body of possible evidence for people.

An Ice-Age Ireland

Ireland around this notional date stood before the coldest phase of the last glaciation, the Last Glacial Maximum, conventionally dated to roughly 26,000–19,000 calendar years ago. It was not yet the uniformly ice-covered landscape often imagined under the phrase “Ice Age”. Reconstructions indicate a changing, climatically unstable world in which ice sheets and local ice caps expanded and contracted, while exposed lowlands and coastal margins could support cold-adapted animals. Exactly how much of Ireland was ice-free at any one time remains debated. Some reconstructions indicate ice-free conditions in parts of Ireland until about 34,000 years ago; others allow for earlier and more extensive ice growth. This uncertainty is crucial: it rules out any confident picture of a single, continuous Irish landscape or a simple route into it.

Even where ground was exposed, it did not resemble modern green Ireland. The available evidence points towards open, treeless or sparsely vegetated terrain in a cold, continental environment: a mosaic of grassland, herb-rich steppe, tundra-like patches, bare mineral ground and sheltered valleys. Temperature, precipitation and seasonality fluctuated sharply over centuries and millennia. Pollen records capable of describing this exact moment are scarce, so the vegetation picture is an informed reconstruction rather than a direct local snapshot. Yet the animal record makes clear that Ireland could, at intervals, sustain large grazing and browsing mammals as well as formidable predators.

Caves and Animal Evidence

The principal archive is Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. Excavated in the early twentieth century, it yielded an extraordinary assemblage of Ice-Age animal bones. Woolly mammoth, reindeer, giant deer, brown bear, wolf, fox and spotted hyaena are among the species recorded from its deposits. The cave has special importance because it preserves evidence from before as well as after the Last Glacial Maximum. Reassessment of the old collections, including more rigorous radiocarbon dating and improved treatment of bone collagen, has pushed some faunal dates significantly earlier than earlier programmes suggested and has strengthened the case that southern Ireland supported varied mammal communities during Marine Isotope Stage 3.

That list must not be turned into a painted scene of all these animals gathering together in 31,959 BCE. Cave deposits accumulate over long spans; animals may have entered naturally, been dragged in by predators, or been moved by water and sediment. The original excavations also removed much of the stratified material before modern recording standards existed. Castlepook is therefore best understood as a time-compressed archive, not a single hunting camp. Its evidence demonstrates that parts of Ireland were ecologically habitable during earlier phases of the last glacial cycle. It does not establish the population size, seasonal movements or precise coexistence of every species represented by the bones.

The Possible Human Trace

The most consequential claim for this period concerns a fragment of reindeer femur from Castlepook. Ruth Carden's examination identified a deep mark interpreted as a cut or chop made by a sharp stone tool during butchery; reporting associated with the discovery described the bone as dating to about 33,000 years ago. If that interpretation and chronology are sustained by further study, it would place human activity in Ireland more than 20,000 years before the better-established Late Upper Palaeolithic evidence from County Clare. It would mean that hunter-gatherers reached, or at least briefly used, an Irish landscape during a comparatively favourable window before the full expansion of the last ice sheet.

But this is not evidence for a settled population, nor for a named archaeological culture. There are presently no securely associated hearths, stone-tool assemblages, dwellings, human remains, burials or rock art from Castlepook that can describe the people who may have cut the bone. The specimen came from an antiquarian collection rather than a modern, intact excavation context, and the cut-mark interpretation needs to be considered alongside natural damage, carnivore activity and the disturbed history of the cave deposits. Recent fieldwork has sought surviving sediments, additional modified bones, charcoal, lithics and possible cave art precisely because the original find, though potentially transformative, cannot answer these questions on its own.

The distinction matters. Across north-west Europe, people of the Upper Palaeolithic made sophisticated stone and organic tools, hunted large game, travelled widely and sometimes created striking figurative or abstract art. Around 34,000 years ago, archaeologists on the continent conventionally discuss the late Aurignacian and the emergence of Gravettian traditions. Ireland has no assemblage that permits it to be assigned confidently to either. It would be reasonable to infer that any hunters who butchered reindeer possessed practical knowledge of stone cutting tools and animal carcasses. It would not be responsible to infer their language, identity, kinship system, ritual beliefs or artistic practices from one modified bone.

Mobility, Not a Polity

Political affairs, diplomacy and organised conflict leave no identifiable trace in Ireland at this date. There is no evidence for tribes, territories, rulers, alliances or warfare, and projecting later Irish identities backwards would be false. If people were present, they were almost certainly members of small, highly mobile hunter-gatherer groups whose social worlds extended beyond the island. Their movements would have depended on changing animal ranges, weather, safe crossing points and knowledge passed between generations. Whether they arrived over temporarily exposed terrain, across narrow stretches of water, beside ice margins or by some combination of routes is not known. Lower global sea levels altered the geography of the surrounding shelf, but should not be simplified into a proven walkable land bridge between Ireland and Britain.

Nor can an economy or trade network be recovered in the usual sense. The possible butchery mark suggests the use of animal food and perhaps hides, sinew or bone, but it does not show a permanent camp or exchange system. Reindeer would have been valuable prey if encountered, supplying meat and fat as well as materials for clothing, bindings and implements. Mammoth, giant deer and carnivores shaped the opportunities and risks of the environment, but their bones alone do not show that people hunted them. A cave may have been a predator den, a trap for animals, a place where bones accumulated after scavenging, or merely a geological container for material washed in from outside.

What Cannot Be Seen

Religion, learning and cultural memory are similarly beyond direct recovery. Caves became significant places in much later Irish prehistory, but there is no basis for calling Castlepook a sanctuary in 31,959 BCE. There are no graves, offerings, structured deposits or images attributable to this period. Knowledge undoubtedly mattered to any Ice-Age travellers: reading tracks, locating shelter, preparing carcasses, working stone and anticipating weather were skills essential to survival. Archaeology can infer that such practical learning existed if human butchery is accepted; it cannot reconstruct stories, ceremonies or beliefs.

The weakness of the record is itself historically meaningful. Subsequent glaciation eroded and buried landscapes, while rising seas later drowned parts of the former coastal plain. Many potential open-air sites may have been destroyed, lie offshore, or remain invisible beneath later sediments. Older cave collections, often excavated before systematic stratigraphic methods, preserve invaluable specimens but frequently lack the contextual information now expected. Ireland's apparent archaeological silence before the Last Glacial Maximum may therefore reflect both genuinely intermittent human use and the severe survival bias imposed by ice, water and earlier excavation.

A Precarious Frontier

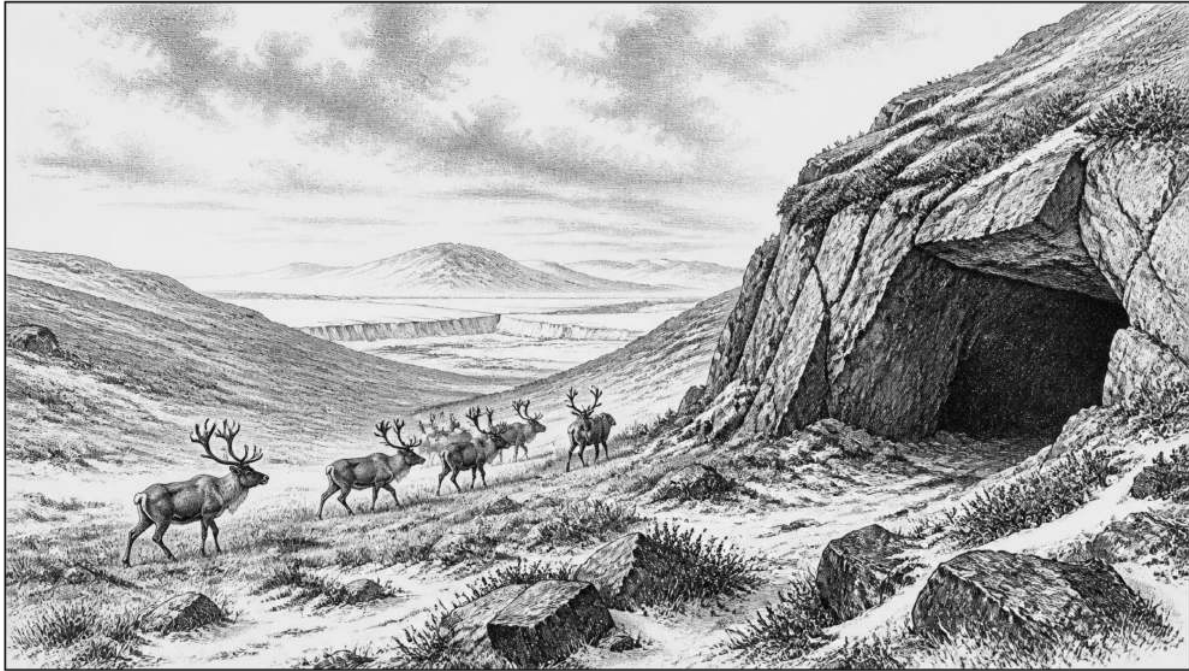
For Ireland, the importance of this date lies not in an event but in a possibility. The faunal evidence shows an Ice-Age country that was not always sealed beneath ice: a northern frontier where reindeer, mammoth, giant deer, bears and hyaenas could inhabit exposed terrain. The cut-marked Castlepook reindeer bone offers a plausible, still developing indication that people entered this world and processed an animal there or nearby. It does not yet demonstrate enduring colonisation. Much later, at Alice and Gwendoline Cave in County Clare, a brown-bear patella bearing cut marks has securely calibrated dates of about 12,810–12,590 cal BP, demonstrating Late Upper Palaeolithic human activity long after the period considered here. The gap between these traces remains one of the central unsolved questions of Irish prehistory.

Thus, around 31,959 BCE, Ireland should be envisaged not as a land of recorded societies but as a changing Ice-Age environment at the edge of human possibility. Future work on cave sediments, direct dating, microscopic surface damage, ancient DNA and submerged landscapes may clarify whether Castlepook records a short hunting visit, repeated seasonal incursions or something more substantial. Until then, the evidence supports cautious wonder rather than certainty.

Chapter 043 of 100

31958 BCE

Cork Animal Processing^[43]



The label 31,958 BCE must not be mistaken for a year that anyone in Ireland could have named, recorded or recognised. It is a modern conversion, not an ancient calendar date, and archaeological dating cannot isolate events on the island to a single year so far back. The responsible view is therefore of a broad period around 34,000 years ago: the Late Pleistocene, within Marine Isotope Stage 3, during the unstable climatic lead-up to the Last Glacial Maximum. For Ireland, it is a significant horizon not because it supplies kings, battles or monuments, but because evidence from County Cork may preserve an exceptionally early, still cautiously interpreted, sign of people handling animals here.

A Range Rather Than a Year

Radiocarbon ages need calibration against changing atmospheric carbon levels, and calibrated ranges, not neat calendar points, are the appropriate measure. The date assigned to this article lies approximately 33,900 calendar years before 1950, but the nearest Irish evidence does not provide a securely dated event in 31,958 BCE itself. Nor do we possess a human skeleton, hearth, dwelling floor, stone-tool assemblage, burial or settlement that can be assigned to this point. What can be discussed is a changing Irish environment and a small, important body of faunal and archaeological evidence spanning several millennia before the major ice expansion.

This was not yet the climatic maximum of the last ice age. Research on the British–Irish Ice Sheet generally places its maximum Irish extent later, broadly around 27,000–23,000 calibrated years BP, although the timing, thickness and behaviour of ice varied markedly between regions. At around 31,958 BCE, colder conditions and advancing ice were part of a longer, irregular process rather than a single

sudden ‘freeze’. Some evidence from western Ireland indicates substantial ice loading before the maximum, while other records show that local conditions and ice limits changed through time. It would be misleading to draw a fixed coastline or a uniform ice margin for this exact notional year.

Castlepook and the Human Question

The most directly relevant site is Castlepook Cave, also called Doneraile Cave, near Doneraile in north County Cork. The cave system in the Awbeg Valley yielded a rich collection of Ice Age animal remains during antiquarian excavations, but much original contextual information was lost or limited. This matters greatly: bones recovered from old cave collections are powerful evidence for the presence of animals, but are less able to reveal exactly where an animal died, where it was eaten, or how long its remains lay exposed before entering the cave.

A reindeer femur from Castlepook has been publicly identified as carrying a deep mark interpreted as having been made by a sharp stone tool during butchery. County Cork heritage material dates the bone to about 31,000 BCE, making it the closest known evidence to the present article’s notional date. If that interpretation is confirmed, it would indicate that a person used a lithic edge on fresh reindeer bone in Ireland during the Upper Palaeolithic. It would be a major revision to the older view that Ireland lacked evidence of human presence before the terminal Pleistocene.

Yet the distinction between evidence and interpretation is essential. The bone’s age dates the animal, not necessarily every action affecting it. Identifying a surface mark as a cut made by a human requires taphonomic judgement: researchers must separate stone-tool damage from carnivore activity, trampling, sediment abrasion, excavation damage and later handling. The cave’s animal assemblage also reflects the activities of predators and scavengers. The Castlepook indication is therefore best described as compelling potential evidence for human butchery, not proof of a permanently settled population, a named hunting band, or a continuous Irish occupation.

Renewed work at Castlepook is designed precisely to improve this position. Researchers have mapped and excavated parts of the cave, seeking surviving undisturbed deposits, secure stratigraphy, fresh dating samples, palaeoenvironmental evidence and artefacts such as stone tools or charcoal. Until such evidence is recovered and published, no particular Upper Palaeolithic culture can responsibly be assigned to Ireland around this date. Terms such as Aurignacian and Gravettian describe well-attested continental and British archaeological traditions, but Ireland presently lacks the diagnostic assemblages needed to identify either here.

An Ice-Age Animal Landscape

Even without a secure camp site, Ireland’s cave deposits establish that the island supported a much richer Late Pleistocene fauna than its later history might suggest. The Irish Quaternary Fauna Project found evidence that a range of mammals reached Ireland between at least about 45,000 and 20,000 years ago. Castlepook is particularly important in this story. Its pre-Last Glacial Maximum deposits have produced remains of reindeer, woolly mammoth, brown bear, giant deer and spotted hyaena, while other cave sites add further evidence for animals moving through changing Irish habitats.

Not every species was necessarily present in every valley or every century. Nevertheless, reindeer and mammoth are historically supportable elements of an Irish landscape around the wider period. Two red-deer specimens from south-eastern Irish caves have calibrated pre-Last Glacial Maximum dates spanning approximately 32,930–29,594 cal BP, broadly overlapping the centuries surrounding this article’s date.

Such finds show that conditions could support both cold-adapted and, at times, relatively temperate fauna during the climatic fluctuations of Marine Isotope Stage 3. They do not demonstrate a stable, uniformly wooded Ireland, nor a single unchanging ‘mammoth steppe’ across the whole island.

For any people who did reach Ireland, large animals would have offered meat, fat, hide, sinew, bone and antler. But the archaeology does not permit a detailed Irish subsistence economy. There are no confirmed contemporary kill-sites, food residues, hearths, weapon points or butchered assemblages from which to reconstruct hunting seasons, group size, gendered work or the division of food. The Castlepook femur, if anthropogenic, suggests animal processing; it does not establish whether people hunted the reindeer, encountered a carcass, or merely removed useful material from it.

Travel, Isolation and Missing Evidence

Low global sea levels altered north-west European geography, exposing parts of continental shelves that are now submerged. But this did not automatically make Ireland an easy extension of Britain or continental Europe. The precise geography of the Irish Sea during the Late Pleistocene was complex, affected by sea level, ice cover, local land movement and glacial lakes. More importantly, access is not evidence of movement. If people were present at Castlepook, their arrival route remains unknown. They may have crossed temporarily exposed terrain, travelled along coasts, or used watercraft; none of these possibilities can presently be demonstrated for this particular period.

Glaciation helps explain why the evidence is so sparse. Later ice repeatedly eroded, transported and buried older surfaces, while post-glacial rising seas drowned former coastal zones where small mobile groups may have camped. Caves can preserve bones and sediment pockets, but they are selective archives, often shaped by animals, water and past digging. A lack of campsites should not be converted simply into proof that nobody visited Ireland; equally, the survival of one modified bone cannot be inflated into a populated landscape. The archaeological record is both fragmentary and uneven.

No Politics, No Recorded Conflict

Political affairs, diplomacy and warfare cannot be recovered for Ireland at this date. There were no known states, written agreements, rulers, tribal names or territorial boundaries. If humans were present, they would have belonged to small, mobile Upper Palaeolithic communities whose social relationships must remain unknown in the specifically Irish case. Archaeology elsewhere in Europe shows that people of this broad era possessed sophisticated stone technologies, social networks and symbolic practices, but those wider parallels are context, not evidence that identical systems operated in Ireland.

There is likewise no direct Irish basis for describing formal religion, shrines, art, schooling, language or inherited myth at 31,958 BCE. The rich ceremonial burial at Paviland Cave in south Wales, dated to about 26,000 BP, demonstrates that symbolic practices existed elsewhere in the western British Isles during the Upper Palaeolithic. It cannot, however, be projected across the sea onto Castlepook several thousand years earlier. For Ireland, the absence of demonstrable ritual evidence is not evidence that people lacked belief; it is a limit on what surviving material can tell us.

A Precarious Presence

The most defensible picture is thus of an Ice Age Ireland in transition: a land of severe and shifting climates, surviving large mammals, advancing ice and altered coasts. Around the broad span represented by 31,958 BCE, the Cork cave evidence allows the possibility of brief human contact with this animal landscape. It does not yet reveal a village, a lineage or an enduring society. The key development is intellectual as much as prehistoric: renewed analysis of museum collections and caves has reopened a question once thought settled, namely whether Ireland's human story began far earlier than the well-documented Mesolithic settlement after about 8000 BCE.

That question remains open. Later evidence is firmer: a cut-marked brown-bear patella from Alice and Gwendoline Cave in County Clare is dated to approximately 10,800–10,500 BCE, while substantial evidence for settled Mesolithic communities appears only after about 8000 BCE. Castlepook pushes inquiry much further back, to the threshold before the great ice advance. It invites further excavation and careful testing, but it also requires restraint. Ireland around 31,958 BCE is not a chapter of recorded events; it is a faint, scientifically valuable trace at the edge of recoverable human history.

Chapter 044 of 100

31957 BCE

Carden's Reindeer Cut Mark ^[44]



Modern calendar precision cannot be applied responsibly to Ireland in 31,957 BCE. This number is a convenient modern label, projected backwards into a world with no written calendars, states or recorded events. The evidence for this stretch of the Late Pleistocene is dated in broad scientific ranges, principally radiocarbon years calibrated to calendar years before present, and its resolution is usually centuries or millennia rather than a single year. The most useful setting is therefore not an imagined event in 31,957 BCE, but Ireland during Marine Isotope Stage 3, in the millennia before the Last Glacial Maximum.

At that time, the island's later familiar landscape, communities and political history did not yet exist. The cautiously reconstructed story comes from cave bones, sediments, landforms, offshore cores and laboratory dating. These sources can show that animals lived in, or passed through, parts of Ireland; that glaciers later transformed the country; and that one remarkable bone may preserve a human trace. They cannot yet supply a continuous narrative of settlement.

Dating an Ice-Age Ireland

The date 31,957 BCE is close to, but should not be equated exactly with, claims concerning a reindeer bone from Castlepook Cave near Doneraile in north County Cork. County Cork heritage publications describe the fragment of reindeer femur as c. 31,000 BCE and identify a deep mark interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone tool during butchery. The wider Castlepook fauna includes animals whose radiocarbon determinations belong to the middle and later parts of the Late Pleistocene. Yet the precision implied by a single numbered year is illusory: radiocarbon results have errors, must be calibrated, and dates from older excavated collections require particular care.

Calibration matters because a radiocarbon age is not automatically a calendar age. Atmospheric carbon-14 changed through time, so laboratories and archaeologists use calibration curves such as IntCal20 to estimate ranges in calendar years. At great antiquity those ranges can be wide. Moreover, the date obtained establishes when an animal died, not necessarily when a mark was made or when any person visited a cave. In this article, dates are therefore expressed as approximate calibrated ranges where securely published, or as broad ‘c.’ estimates where the underlying claim is less fully documented.

The period belongs to the Upper Palaeolithic in the broad European archaeological sequence, but applying that label to Ireland must not imply a known Irish stone-tool industry, settlement tradition or population. No securely associated Upper Palaeolithic hearth, house, tool assemblage, burial or occupation surface has yet been recovered in Ireland for this early phase. Archaeologists can discuss the possibility of human activity; they cannot yet describe an established Palaeolithic society on the island.

Castlepook and the Human Question

Castlepook Cave is important precisely because it offers a rare, potentially transformative clue. The cave was excavated by the naturalist Richard Ussher and others in the early twentieth century, producing a substantial collection of Ice-Age animal remains. A new excavation in 2022, supported by the Royal Irish Academy, revisited the site and its complicated archaeological potential. Such work is necessary because antiquarian excavation often removed deposits without the stratigraphic recording now expected, while caves themselves are places where water, collapsing sediment, scavengers and carnivores can mix material from different times.

The cut-mark interpretation on the reindeer femur is plausible enough to merit serious attention, but it remains a very small piece of evidence. If the mark was made by a stone edge, it indicates that a person processed a reindeer either at or, perhaps more likely, away from the cave before the bone reached it. It does not demonstrate a hunting camp inside Castlepook, a permanent local population, or continuous occupation of Ireland. The absence of a stone tool found in secure association is especially significant. The responsible formulation is that the bone may record an early, brief human presence in Ireland during the Late Pleistocene.

This distinction is not a pedantic one. Ireland’s formerly accepted earliest human evidence was much later: a brown-bear kneecap with cut marks from Alice and Gwendoline Cave, County Clare, directly dated to roughly 12,810–12,590 calibrated years before present. Later research has strengthened its environmental context but also found that the cave sediments were repeatedly disturbed and much material had been transported into the cave. Those results demonstrate both the value and the limitations of Irish cave archives. A proposed human trace from around 31,957 BCE is exciting, but remains less securely contextualised than a conventional excavated site.

A Fauna Before the Maximum

Long before the ice sheet reached its greatest extent, parts of Ireland supported a striking cold-stage fauna. Castlepook has yielded evidence for reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, spotted hyaena and small cold-adapted mammals including lemmings. Not every species can be placed precisely in the same century, season or local habitat, and a cave assemblage is not a census of the countryside. Predators may have dragged prey into a den, while water and sediment could have moved

bones. Nevertheless, the assemblage establishes that Ireland was connected to wider north-west European ecological processes and that sizeable grazing animals and their predators occurred here during milder or less ice-covered phases of the Late Pleistocene.

Reindeer are particularly evocative because their seasonal movements elsewhere in Ice-Age Europe made them important prey for mobile hunter-gatherers. That European comparison helps explain why a butchered reindeer bone would be meaningful, but it cannot fill the Irish evidential gap. There is no basis for claiming a named people, a language, an ethnic identity, a tribe, or an Aurignacian or Gravettian cultural affiliation for any possible visitors to Castlepook. Nor can the sparse material establish whether people arrived as a party following game, on an exploratory journey, or during repeated but separate visits.

The surrounding environment should not be imagined as Ireland's modern green, hedged countryside. Vegetation and terrain shifted with climate, altitude, exposure and ice cover. Open, cold grassland, herb-rich steppe-tundra and sparse shrub vegetation would have supplied grazing in suitable areas, while limestone caves offered sheltered dens and traps for bones rather than straightforward homes. Large mammals imply productive grazing landscapes somewhere within the region, but their remains do not prove that every part of the island was similarly habitable. Coastal plains now drowned by post-glacial sea-level rise may also have held evidence that is inaccessible or destroyed.

Ice, Sea and Changing Ground

In the long view, this was an Ireland on the approach to profound environmental disruption. Reconstructions of the British–Irish Ice Sheet show major growth through the interval from about 31,000 to 15,000 years before present, with the maximum ice volume reached around 23,000 years ago. Research on Ireland's shelf and mountains indicates that, at the Last Glacial Maximum, approximately 27,000–23,000 calibrated years before present, ice covered Ireland and extended over much of its continental shelf. That maximum lay thousands of years after the nominal year considered here, but it explains why early evidence is so fragile: later glacier ice eroded, buried and rearranged much of the older terrestrial record.

At c. 31,957 BCE, conditions were not uniform or static. The ice sheet grew and altered its margins over millennia, and scientific reconstructions are refined as new exposure dates, marine cores and landform mapping are added. It is safer to picture a cold, variable Atlantic fringe than a single frozen tableau. Sea levels were lower globally because water was retained in ice sheets, changing the extent of the continental shelf and coastlines. Even so, Ireland's insular position was a major ecological constraint. It helped restrict the later recolonisation of plants and animals and would have presented a serious barrier to any human movement.

The physical legacy of these climatic transformations remains visible in Ireland's U-shaped valleys, corries, streamlined bedrock, tills, eskers, drumlins and lake basins. Most were formed or strongly remodelled by later stages of the glaciation and deglaciation, not in one moment in 31,957 BCE. They are evidence of the processes that made the deep prehistoric past difficult to recover as much as they are reminders of the Ice Age itself.

No Politics, No Recorded Conflicts

Political affairs, diplomacy and organised warfare cannot be described for Ireland at this date because the evidence does not support them. There were no Irish kingdoms, no known territorial boundaries, no inscriptions and no historical actors. If people did reach the island, they would have lived in very small, mobile hunter-gatherer groups, as is broadly consistent with Upper Palaeolithic lifeways elsewhere in Europe. That is an informed comparative interpretation, not a fact demonstrated by an excavated Irish camp.

The same restraint applies to everyday life. A sharp cut on a reindeer bone, if anthropogenic, suggests knowledge of a cutting implement and the processing of animal tissue. It does not reveal how meat was shared, where people slept, whether they made clothing, or how long they remained. Fire, shelters, woodwork, hide-working, ornaments and hunting weapons may all have been used by comparable European populations, but none can responsibly be assigned to Ireland in this particular period without direct evidence.

Culture Beyond Recovery

There is likewise no Irish evidence from around this date for religious practice, ritual, art, teaching, music or formal exchange networks. Caves can easily invite romantic assumptions of sacred spaces or painted chambers, but Castlepook's securely identified significance is palaeontological and archaeological, not evidence of Palaeolithic cave art or ceremony. The animals represented there may have been hunted, scavenged, preyed upon by carnivores or naturally accumulated in the cave system. Each possibility must be tested bone by bone.

Trade in the usual sense is equally beyond demonstration. There are no known imported artefacts or sourceable toolstones of this date from Ireland. Any human movement would have connected Ireland, however fleetingly, with the wider European world, but that is not proof of a durable exchange route. The fundamental economic relationship visible in the record is between large herbivores, predators, climate and changing habitat. If people were present, their subsistence depended on entering that ecological web rather than on farming, herding or commerce.

What Can Be Said

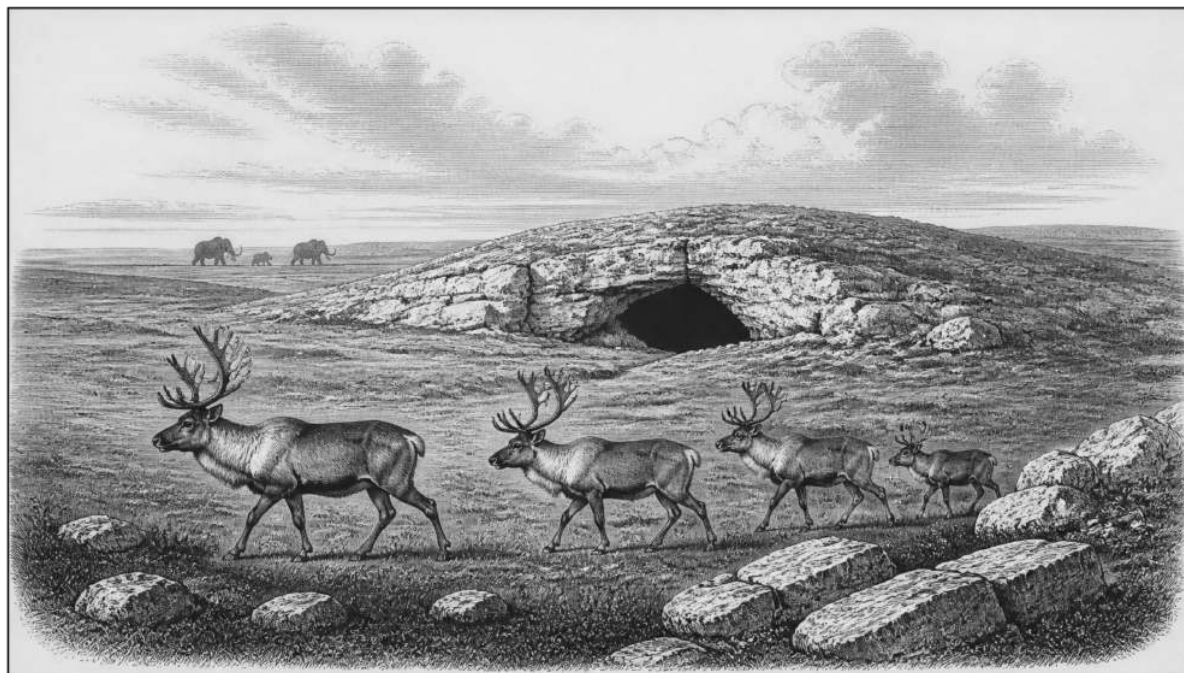
Ireland around 31,957 BCE was not yet a historical society but a changing Late Pleistocene environment at the Atlantic edge of Europe. The strongest evidence concerns fauna and climate: reindeer and other cold-stage animals occurred in Ireland during this broad era, while the British–Irish Ice Sheet was growing towards a later maximum that would dramatically reshape the land. The Castlepook reindeer femur offers a tantalising possible sign that humans encountered and butchered one of those animals. It deserves continued investigation, not unqualified certainty.

That measured conclusion is still consequential. It shifts attention from a simple story in which Ireland was first visited only after the last ice retreat to a more complex possibility of earlier, discontinuous human contact. Future excavation, microscopic study of the mark, new direct dates, sediment analysis and the discovery of securely stratified tools may confirm, qualify or overturn the present interpretation. For now, the most historically honest picture is of a sparsely evidenced Ice-Age Ireland: alive with animals, increasingly vulnerable to advancing ice, and perhaps briefly entered by people whose presence survives in no more than a single marked bone.

Chapter 045 of 100

31956 BCE

Castlepook's Reindeer Bone^[45]



Modern calendar precision cannot responsibly turn 31,956 BCE into an Irish annal. No community in prehistoric Ireland recorded such a year, and the surviving evidence cannot identify a particular season, generation, ruler or event. The number is best treated as a modern point within a very long span: roughly 33,900 years before 1950, during the later part of the last glacial cycle. Archaeologists and Quaternary scientists instead work with dated deposits, radiocarbon determinations, calibrated ranges where available, and changing environmental sequences. Around this point, Ireland belongs broadly to Marine Isotope Stage 3 and the Middle Midlandian or Devensian cold stage, before the fullest expansion of the Last Glacial Maximum.

A Country in a Changing Ice Age

Ireland at this time was not the familiar green, wooded island of later millennia. The climate was cold and highly variable, and the landscape was being shaped by frost, snow, meltwater, wind and advancing or retreating ice. Yet it would be misleading to picture every part of the island as continuously buried beneath a single unchanging ice sheet. The timing, extent and thickness of ice across Ireland before the Last Glacial Maximum remain subjects of active research. Geological reconstructions indicate that the major maximum of the British–Irish Ice Sheet came later, broadly between about 26,000 and 19,000 years ago, while evidence from some uplands suggests that areas of northern and central Ireland remained ice-free until at least around 34,000 years ago.

That does not amount to a map for 31,956 BCE. The available chronological controls have wide uncertainties, and conditions could differ greatly between uplands, lowlands, coasts and the Irish Sea basin. The responsible conclusion is regional and conditional: parts of Ireland were capable of supporting

terrestrial life before the later ice-sheet maximum, while other places may have been glaciated, periglacial or rendered inaccessible by severe conditions. The country was in transition, not a stable environmental state.

Sea level was much lower than today because enormous volumes of water were held in continental ice sheets. The outlines of coasts and shallow seas were therefore different, but lower sea level alone does not prove a simple, dry land route into Ireland. Ice margins, marine channels, seasonal conditions and the shifting configuration of the British–Irish landmass all matter. For this period, there is no securely documented route by which people reached Ireland, and no basis for imagining routine crossings, permanent roads or regular contact networks.

Tundra, Grassland and Ice-Age Animals

The clearest evidence for the Irish environment comes not from human settlements but from animal bones, sediments and fossil plant remains. At Derryvree in south Fermanagh, a freshwater deposit dated to about 30,500 radiocarbon years before present produced plant and animal evidence consistent with open tundra and a periglacial climate. Although it is later than the modern date label used here, it offers a valuable regional indication of the kinds of cold, open environments that could develop in Ireland during this part of the glacial cycle.

Vegetation was probably dominated in many exposed places by grasses, sedges, herbs, mosses and low shrubs rather than closed forest. The precise local mix depended on moisture, soil, shelter and temperature; pollen can also travel long distances, so individual grains do not automatically prove that a plant grew beside a sampled deposit. Nevertheless, the broad picture is one of a sparse, treeless or largely treeless landscape, with a short growing season and strong seasonal pressures on both plants and animals.

Castlepook Cave near Doneraile in north County Cork is central to this earlier Irish story. Its cave deposits and museum collections have yielded the richest known assemblage of pre-Last Glacial Maximum vertebrate remains from Ireland. Mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, lemmings and spotted hyaena are among the animals represented. Their presence demonstrates that Ireland was not biologically empty during parts of the Ice Age. It also evokes a food web very different from that of historic Ireland: large grazing and browsing animals shared the landscape with scavengers and predators adapted to cold or open conditions.

However, a cave bone assemblage is not a census of the surrounding countryside. Carnivores carried prey into caves; scavenging, water movement, disturbance and early excavation methods mixed material from different episodes. Castlepook was used as a repository of bones across a long period, not as a sealed snapshot of one day or one year. Some individual specimens have produced dates ranging broadly from about 45,700 to 19,950 years before present. Older published radiocarbon determinations, including a mammoth bone dated to $33,400 \pm 1,200$ radiocarbon years before present, have also required reassessment as laboratory methods and pretreatment improved.

The Possibility of Human Visitors

The question of people in Ireland around this date remains more difficult than the question of animals. The National Museum of Ireland has long stressed that there is no clear, established body of Palaeolithic settlement evidence comparable to that known in Britain or continental Europe: no securely excavated habitation floor, hearth, stone-tool assemblage, human burial or cave art can presently be assigned to about 31,956 BCE in Ireland.

There is, nonetheless, an important developing lead from Castlepook. A reindeer bone from the older collections has been reported as dating to approximately 33,000 years ago and as bearing marks interpreted as possible cuts made by a sharp stone tool. If both the dating and anthropogenic interpretation are confirmed through full publication and contextual study, it would be striking evidence that humans processed an animal in Ireland before the Last Glacial Maximum. It would not, by itself, demonstrate a settled population. A butchered bone might represent a short hunting or scavenging visit by a small mobile party, and the original excavation history means that its precise relationship to surrounding deposits is difficult to reconstruct.

The distinction matters. Directly dated cut-marked bear bone from Alice and Gwendoline Cave, County Clare, gives stronger published evidence for a much later Upper Palaeolithic human presence, calibrated to 12,810–12,590 cal BP. That discovery established that people reached Ireland before the Mesolithic, but it cannot be projected backwards by more than twenty millennia to fill the gap at 31,956 BCE. The Castlepook material is potentially transformative precisely because the earlier evidence is so sparse, not because it has already settled the matter.

Society Beyond the Evidence

Nothing supports a year-specific account of political affairs, warfare, diplomacy, named leaders or territorial kingdoms. There were no states, towns, written records, monuments or known institutions in Ireland from which such claims could be drawn. Nor is there evidence for trade in the later sense of regular exchange between identified communities. If people did reach the island, they would have belonged to highly mobile Upper Palaeolithic hunter-gatherer worlds known elsewhere in north-west Europe, but Ireland has not produced the diagnostic artefact collections needed to assign a local group confidently to a named archaeological culture.

Everyday life can therefore be discussed only at the level of possibility. A party able to kill, acquire or process reindeer would have needed practical knowledge: reading animal movements, managing cold exposure, carrying cutting tools, sharing food and choosing shelter. Such capacities are reasonable inferences from Upper Palaeolithic lifeways elsewhere, but they are not directly evidenced as a complete social system in Ireland. The Castlepook cave itself should not be assumed to have been a human home. Its hyaena remains and accumulated animal bones underline its role as a dangerous carnivore-used place as well as a potential location of brief human activity.

Religion, language, music, visual art and formal learning lie beyond recovery for this particular Irish horizon. Humans elsewhere in Europe made ornaments, images and elaborate tools during the Upper Palaeolithic, but no equivalent material has been securely found in Ireland for this date. Silence in the record is not proof that thought, ritual or storytelling were absent; it is a limit on what archaeology can demonstrate. It is more accurate to say that Ireland's evidence has not yet revealed them.

An Unfinished Earliest History

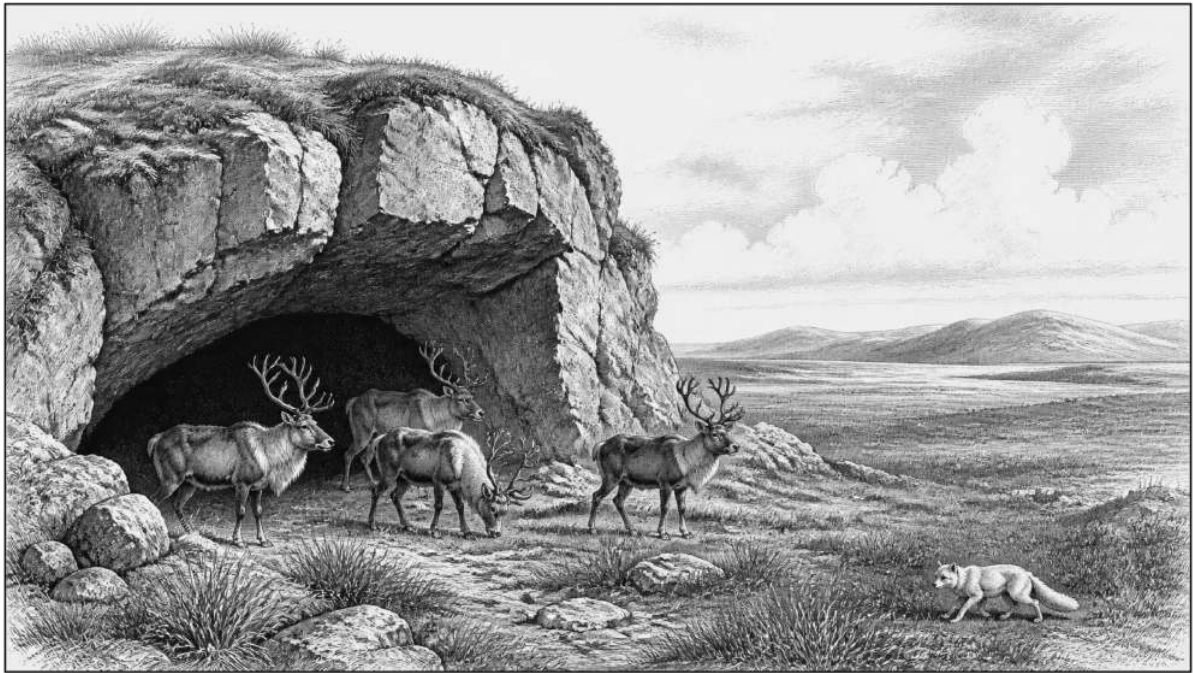
The greatest development relevant to 31,956 BCE was environmental rather than political: Ireland was part of a cold, changing north-west European world in which ice-sheet growth, exposed continental shelves, open vegetation and mobile animal populations continually altered opportunities for life. Castlepook Cave shows that mammoths, reindeer, hyaenas and other animals reached the island during the wider Middle to Late Pleistocene. The reported modified reindeer bone raises the serious possibility that people did too.

But the evidence does not support a confident story of an Irish population, a migration episode or a particular event in this numbered year. The most useful historical lesson is methodological. Ireland's deep past is preserved unevenly: in cave sediments, old museum collections, radiocarbon samples, glacial landforms and microscopic traces of former environments. Renewed excavations at Castlepook and improved dating techniques may substantially refine the picture. For now, 31,956 BCE marks a threshold of possibility—an Ireland inhabited certainly by Ice-Age fauna, shaped by a deteriorating climate, and perhaps visited briefly by people whose presence has only begun to be detected.

Chapter 046 of 100

31955 BCE

British-Irish Ice Sheet Expansion ^[46]



“31,955 BCE” is a modern calendar label, not a date that can be matched to a documented Irish event. There were no written records, named communities, rulers or calendars in Ireland at this depth of time, and archaeology cannot resolve activity to a particular year. In relation to the radiocarbon convention of “before present” (AD 1950), the label sits roughly 33,900 calendar years ago, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), an unstable interval of the last Ice Age. The responsible history of this moment is therefore a history of dated bones, cave deposits, ice-sheet reconstructions and uncertainty—not a narrative of a particular hunt or settlement.

It is nonetheless an important horizon. Ireland’s evidence from before the Last Glacial Maximum is very slight, but Castlepook Cave near Doneraile in north County Cork preserves an exceptional collection of animal remains from this broader period. A reindeer femur from the collection has been interpreted as bearing a cut mark made by a sharp stone tool, and its reported age has been described as around 33,000 years ago. If that interpretation is sustained, it may represent a fleeting Upper Palaeolithic human presence in Ireland far earlier than the island’s formerly accepted archaeological record. It does not, however, establish a settlement, a resident population, or an event in 31,955 BCE itself.

A Date Range, Not a Year

Radiocarbon results are not calendar dates until they have been calibrated against changing atmospheric levels of carbon-14. At ages approaching 34,000 years, the resulting calibrated ranges can be broad and sometimes irregular. Moreover, a date obtained from an animal bone identifies when that animal died, not automatically when people handled it. The modern re-dating of faunal material from

Castlepook has demonstrated exactly why caution is needed: improved pretreatment methods produced dates thousands of radiocarbon years older than several earlier results. Such revision is not a flaw in archaeology; it is a reminder that the evidence and its chronology are continually tested.

Castlepook's original excavations, carried out mainly in the early twentieth century, recovered a very large bone assemblage but did not meet present-day standards of excavation, recording or stratigraphic sampling. Deposits had also been disturbed by natural processes and by earlier digging. A cave is not automatically a human camp. Carnivores can drag carcasses and loose bones into caves, water and sediment can move material between spaces, and modern researchers must distinguish traces of stone tools from animal teeth, trampling, breakage and other surface damage. Recent excavation and research projects at Castlepook seek securely recorded deposits, charcoal, stone artefacts, modified bone and other contextual evidence. Until such evidence is published and independently assessed, the possible human signal should be treated as promising but limited.

An Island of Ice-Age Fauna

The firmer evidence concerns animals. Research on Irish Quaternary fauna has shown that a range of mammals reached Ireland during MIS 3, broadly between at least 45,000 and 20,000 years ago. Castlepook has yielded remains attributed to woolly mammoth, reindeer, giant deer, brown bear, spotted hyaena, wolf, Arctic fox, mountain hare and small cold-adapted mammals including lemmings. The assemblage makes the cave one of the most valuable archives for understanding Irish environments before the full glaciation that followed.

These animals should not be imagined as a neat, simultaneous cast standing together on an open plain in a single year. Individual specimens belong to differing episodes within a long climatic interval. Nor do their remains prove the exact vegetation around the cave at any one time. Taken together, however, they indicate that parts of southern Ireland could support a changing Pleistocene fauna during relatively favourable phases. Reindeer and lemmings point towards cold, open environments; mammoth and giant deer indicate substantial grazing landscapes; hyaenas, wolves and bears demonstrate a food web that included major predators and scavengers. The cave itself may have been used repeatedly by carnivores as a den or feeding place, helping to explain both the richness and the mixed nature of its bone record.

In this setting, the reported reindeer cut mark has importance precisely because it is so modest. It may indicate that a person or small group processed an animal somewhere in the Castlepook landscape, perhaps removing meat or disarticulating a limb. It cannot show whether the animal was hunted, found dead, scavenged from another predator, or butchered at the cave. It cannot identify the people, their language, sex, age, number, ancestry or destination. Stone tools, hearths, shelters, repeated activity surfaces and human remains have not been recovered from this period in Ireland. A single modified specimen is evidence for a possible action, not a complete society.

Climate, Ice and Changing Coasts

MIS 3 was marked across the North Atlantic region by rapid climatic oscillations. Ireland lay at Europe's north-western edge, exposed to Atlantic weather systems and close to expanding ice masses in Britain and the Irish Sea basin. Ice-sheet reconstructions indicate that, around 31,000 years ago, the British-Irish Ice Sheet was still relatively small compared with its later maximum, with ice concentrated especially in Scotland and parts of Ireland. By about 30,000 years ago it expanded rapidly, and by roughly 27,000–26,000 calibrated years before present an extensive ice sheet covered Ireland and advanced across

its surrounding continental shelf. The landscape around the nominal date was therefore not necessarily the fully ice-covered Ireland of the Last Glacial Maximum, but it was part of a region heading into profound glacial transformation.

Sea level was lower than today because vast quantities of water were stored in global ice sheets. The outlines of Ireland's coasts and surrounding shelves were different, while local uplift and depression caused by ice loading complicate any simple reconstruction. Lower seas do not by themselves prove a dry route into Ireland at every time or place. The means by which animals—and any people—reached the island remain a central question. Recent sedimentary ancient-DNA research from Castlepook, currently reported as a preprint, strengthens the case that Irish megafauna formed part of wider Eurasian populations before the Last Glacial Maximum. That supports biological connectivity, but does not specify whether movement occurred over exposed ground, seasonal ice, short sea crossings or a combination of changing routes.

People at Europe's Edge

Elsewhere in north-west Europe, people of the Middle Upper Palaeolithic made finely worked stone and bone tools, hunted and scavenged animals, used pigments and ornaments, and maintained social connections across considerable distances. Archaeologists often use cultural terms such as Aurignacian and Gravettian for parts of this wider European sequence. Those labels must not be transferred automatically to Ireland. No securely dated Irish lithic assemblage, dwelling, burial, artwork, ornament or hearth currently allows Castlepook activity to be assigned to one of those traditions.

Accordingly, there is no evidential basis for political affairs, diplomacy, warfare, territorial leadership, trade networks, religious rites, formal learning or artistic traditions in Ireland in this particular period. There is also no basis for describing farms, villages, boats or permanent houses. If people did visit the island around the time represented by the reindeer bone, they were almost certainly highly mobile hunter-gatherers living in small social groups, as was common across Upper Palaeolithic Europe. But that is a comparative inference, not a directly demonstrated fact about an Irish community. Their material possessions may have been portable and perishable, while later glaciation, erosion and rising seas have further reduced the chances of their survival.

What Can Be Said Responsibly

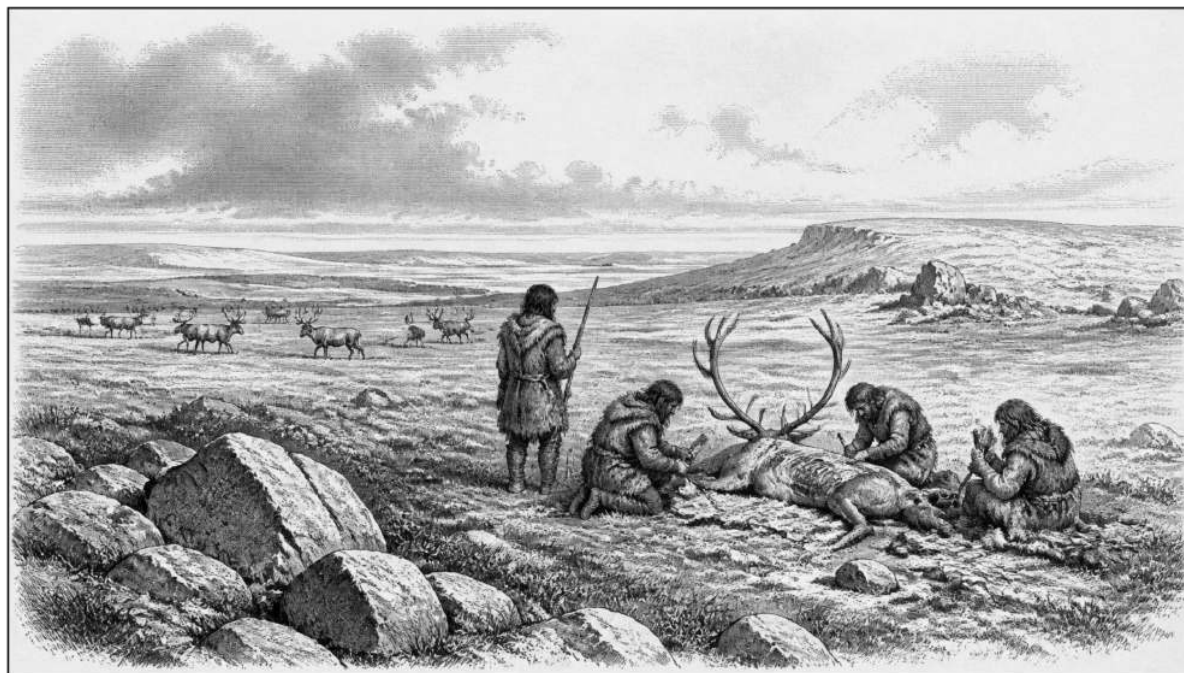
The most meaningful development around 31,955 BCE is environmental rather than political. Ireland was a changing Ice-Age territory where large mammals and predators occupied landscapes that would later be overridden or reshaped by the British–Irish Ice Sheet. In County Cork, Castlepook Cave accumulated a fragmentary record of that lost world. One reindeer bone, interpreted as stone-tool modified, raises the possibility that people also entered it. Its value lies not in licensing a detailed story of Ireland's "first settlers", but in directing research towards caves, former landscapes and submerged shelves where earlier evidence may remain.

For now, the historical verdict must remain deliberately restrained. Ireland at this time had demonstrable Pleistocene fauna, rapidly changing climate and geography, and a possible trace of human butchery. It has no securely documented settlement history. Future excavation, direct dating, taphonomic analysis and ancient-DNA work may sharpen that picture. Until then, the Ice Age bone record is both an extraordinary discovery and an invitation to distinguish what is known from what is merely possible.

Chapter 047 of 100

31954 BCE

Ruth Carden's Reassessment^[47]



The label 31,954 BCE cannot identify a recorded Irish year, an event, a ruler or even a season. No written calendar existed in Ireland, and archaeology cannot date activity of this age to a single modern calendar year. It is best treated as a notional point about 33.9 thousand calibrated years before present, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), a climatically volatile interval of the last Ice Age. The responsible history of Ireland at this point is therefore a history of evidence, uncertainty and landscape rather than a conventional annual chronicle.

That evidence matters because it may include the earliest presently proposed sign of human activity on the island. Yet it is extremely slight. Ireland around this approximate date was not a land of documented settlements, tribes, trade routes or monuments. It was a northern Atlantic landscape in which animal populations, changing climate, ice expansion and possible short-lived human visits have left a sparse and difficult archaeological record.

A Date Range, Not a Dated Event

The closest evidence comes from Castlepook Cave near Doneraile in north County Cork. Excavations there in the late nineteenth and early twentieth centuries recovered a large assemblage of Ice Age animal remains, now principally in the National Museum of Ireland's collections. Subsequent re-examination has shown why old museum collections remain important: bones once given broad or unreliable dates can be identified anew, sampled with improved methods and studied microscopically for traces of animal or human action.

A reindeer femur from Castlepook has been publicised by its researcher, Ruth Carden, and by Cork heritage publications as bearing a deep mark interpreted as having been made by a sharp stone tool during butchery. The object has been assigned broadly to about 31,000 BC in public heritage material. If that

interpretation is correct, it indicates that someone used a cutting edge on a fresh reindeer carcass in Ireland during the Upper Palaeolithic, far earlier than the island's formerly accepted archaeological starting point.

However, this is not evidence for a village at Castlepook, let alone a permanent population. The original cave excavations were undertaken before modern standards of stratigraphic recording. Deposits in caves can be disturbed by water, frost, burrowing animals, collapses and carnivores dragging in carcass parts. A bone date establishes when the animal lived, not automatically when a mark was made or when people were present. The cave's deposits also contain remains accumulated over long spans rather than a single frozen moment in time. The cut-mark interpretation is important and plausible, but it remains a narrow claim that requires more securely excavated, stratified corroboration.

Southern Ireland in MIS 3

At this time Ireland was in the Midlandian, the Irish name for the last glacial cycle. It was not yet at the Last Glacial Maximum, when the British-Irish Ice Sheet reached its greatest known extent, broadly between 27,000 and 23,000 calibrated years before present, and covered Ireland and much of its continental shelf. Around the notional year in question, the great ice advance lay ahead. Climate in north-west Europe nevertheless changed sharply over millennia and centuries, alternating between colder and relatively milder phases.

It would be misleading to picture the whole island as one uniform white expanse. The southern cave fauna demonstrates that at least some ice-free landscapes in Ireland supported cold-adapted mammals during MIS 3. Castlepook and other southern Irish caves have produced remains attributed to reindeer, woolly mammoth, giant deer, brown bear, Arctic fox, wolf, hare, lemmings and spotted hyaena. Their presence does not prove that every species lived side by side in County Cork in 31,954 BCE: specimens come from different contexts and ages, and direct dating has revised several older chronologies. It does, however, show that Ireland formed part of an Ice Age ecological zone rather than an empty geological stage.

The likely environments around such animals were open, windswept and strongly seasonal: mosaics of grassland, herb-rich steppe, tundra-like vegetation, exposed rock, river valleys and scattered sheltered ground. Tree cover, where it existed locally during more favourable episodes, cannot be assumed to have resembled later Irish woodland. The familiar green, enclosed and heavily farmed appearance of modern Ireland is a much later creation. In this earlier world, large herbivores and their predators moved through landscapes periodically remade by cold, permafrost processes, erosion and advancing ice.

Animals, Carnivores and a Possible Hunt

Castlepook's fossils provide the strongest evidence for everyday ecological relationships, but they must not be converted too quickly into a human story. Hyenas, wolves and bears could hunt, scavenge, drag bones into caves and alter them with teeth. Caves were not necessarily human homes; many were carnivore dens, traps or places where bones accumulated after natural deaths. A mammoth bone from Castlepook, for example, bears damage consistent with carnivore activity. Such marks are a reminder that human modification must be distinguished carefully from trampling, weathering, excavation damage and animal gnawing.

If the reindeer femur was genuinely butchered with a stone edge, it offers a small but vivid insight into subsistence. Reindeer were valuable prey: a carcass could provide meat, fat, hide, sinew and bone, while antler could be worked elsewhere. Yet the evidence does not show whether people killed the animal, found it dead, took portions from a carnivore kill or processed it at another place before the bone reached the cave. Nor have stone tools securely associated with this episode been recovered. “Hunting party” is thus a reasonable possibility, not an archaeological fact.

There is equally no basis for claiming regular seasonal camps, family groups of a known size, dwellings, clothing styles or a stable Irish population. Upper Palaeolithic communities elsewhere in Europe possessed sophisticated stone technologies, tailored clothing, fire use, social networks and varied artistic traditions. These comparisons help explain what mobile hunter-gatherers were capable of, but they cannot fill Ireland’s evidential gap. No securely dated Irish hearth, built shelter, lithic workshop, personal ornament, burial, rock art or human bone currently provides such detail for this period.

Movement at the Atlantic Edge

The possible Castlepook trace raises an obvious question: how did people or animals reach the land now called Ireland? Sea level was far lower during the glacial world than it is today, exposing areas of the modern continental shelf. But the precise geography of passages, shallow seas, ice margins, islands and possible land connections changed through time and remains model-dependent. Later reconstructions indicate that Ireland became separated from Britain by roughly 16,000–15,000 calibrated years before present, but that later result cannot simply be projected backwards to every phase of MIS 3.

For about 33,900 calibrated years ago, the prudent conclusion is not that a proven land bridge existed, nor that people demonstrably crossed open sea. Rather, changing geography may have created routes or barriers that remain imperfectly understood. Animal dispersal and a possible human presence in southern Ireland show that access was possible at some stage, but they do not identify the route, the direction of travel or the frequency of contact. A single butchered bone cannot demonstrate diplomacy, exchange systems or a durable connection with Britain or continental Europe.

No Politics, No Recorded Conflict

There were no states, kingdoms, named peoples or written institutions in Ireland at this date. Political affairs and diplomacy are therefore beyond the evidence. It is also impossible to identify warfare. The presence of dangerous carnivores and the practical risks of cold, hunger and travel say much about environmental danger, but nothing securely about conflict between people.

Society can only be addressed conditionally. If small human groups entered Ireland during a milder interval of MIS 3, they were probably highly mobile hunter-gatherers whose survival depended on shared labour, detailed knowledge of animal movement, tool use and flexible responses to weather. That is an inference from the wider Upper Palaeolithic world, not a description recovered from an Irish camp. Ireland’s record does not yet reveal language, kinship, leadership, gender roles, childhood, healing practices or the treatment of the dead.

Culture Beyond Recovery

Religion, ceremony, music, visual art and formal learning leave no recognised evidence in Ireland around this point. It would be inappropriate to attach later Irish myths, Celtic identities, megalithic monuments or Christian traditions to people who may have passed through tens of thousands of years earlier. Even the word “Ireland” is a geographical convenience here, not the name of a known community or polity.

The most defensible cultural observation is methodological. The study of this deep past relies on several kinds of expertise working together: zooarchaeology to identify animals and surface marks; radiocarbon science to date surviving collagen; palaeogenetics to refine species identification; sediment and cave studies to reconstruct context; and glacial geomorphology to understand lost landscapes. Improved pretreatment of bone samples has already shown that some older Irish cave dates were too young, demonstrating that apparent certainties must be tested repeatedly.

An Interrupted Record

Any people who may have reached Ireland in this phase left no known continuous descendants or enduring archaeological sequence. The approaching Last Glacial Maximum transformed the island profoundly. Extensive ice later scoured and buried landscapes, while sea-level change drowned parts of the former coastal plain. These processes help explain why the archaeological record is so fragmentary, although erosion alone cannot be used to prove an unseen Palaeolithic population.

Much later, after deglaciation, a cut-marked bear bone from Alice and Gwendoline Cave in County Clare indicates another possible human visit in the Late Upper Palaeolithic, around 12,810–12,590 calibrated years before present. More sustained and unquestioned settlement is documented only in the Mesolithic, from roughly the eighth millennium BC, including the well-known site at Mount Sandel in County Londonderry. The gulf between those later communities and the possible MIS 3 visitors is immense.

For 31,954 BCE, then, Ireland’s history is not a tale of a named event. It is a cautiously framed picture of pre-maximum Ice Age landscapes, reindeer and other cold-climate fauna in the south, and one consequential bone from Castlepook Cave. The bone may preserve a fleeting human action: the cut of a stone tool on an animal carcass. It cannot yet tell us who made it, how long they stayed, or whether anyone returned. That restraint is not a failure of history; it is the central fact of Ireland’s deepest recoverable past.

Chapter 048 of 100

31953 BCE

Carden's Reindeer Femur^[48]



The label 31,953 BCE is a modern chronological convenience, not a year that anyone in prehistoric Ireland could have named, recorded or experienced as a fixed calendar date. Archaeology cannot identify an event, a ruler or even a particular generation on the island in that single year. The responsible frame is therefore broader: around 33,900 calibrated years before present (cal BP, with “present” conventionally 1950), Ireland lay in the later part of Marine Isotope Stage 3, a climatically unstable phase of the last Ice Age and the long approach to the Last Glacial Maximum. Dates of this antiquity are generally expressed as ranges, because radiocarbon measurements require calibration and because cave deposits rarely preserve a simple, undisturbed sequence.

An Island in the Last Ice Age

This was not yet the peak of the last glaciation. The Last Glacial Maximum is conventionally placed later, broadly about 26,500–19,000 years ago, when the British–Irish Ice Sheet attained its greatest overall extent. Yet the cold world which would produce that maximum was already taking shape. Reconstructions of the British–Irish Ice Sheet indicate substantial expansion after roughly 31,000 years ago, with different sectors advancing at different times. The exact coverage of Ireland at any moment around 31,953 BCE remains uncertain: an ice sheet is not a static white blanket, but a changing system of snow accumulation, flowing ice, meltwater and shifting margins.

For that reason, it would be misleading to imagine either a wholly ice-covered island or a uniformly open, habitable landscape. Parts of Ireland may have supported cold-stage environments and animal populations before later ice overran or reshaped much of the land. Other areas may already have been affected by expanding ice. Subsequent glaciation matters greatly to the historical record. Moving ice erodes bedrock, transports sediments, buries older surfaces and destroys fragile traces such as hearths,

campsites, footprints and scatters of stone tools. The striking scarcity of early archaeological sites in Ireland may therefore reflect both a very small human presence and the extraordinary difficulty of preserving or finding evidence from it.

What Castlepook Cave Can Tell Us

The most important evidence close to this horizon comes from **Castlepook Cave**, also known as Mammoth Cave, near Doneraile in north County Cork. The cave has yielded one of Ireland's richest Pleistocene faunal collections. Research on its animal bones, together with re-dating using improved laboratory methods, has demonstrated that southern Irish caves preserve evidence of mammals living in Ireland during Marine Isotope Stage 3, well before the Last Glacial Maximum. The wider Irish Quaternary Fauna Project found that a varied mammal fauna colonised the island at intervals between at least about 45,000 and 20,000 years ago.

Castlepook's collection includes remains attributed to reindeer, giant deer, woolly mammoth, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. This list should not be treated as a photograph of a single day, season or even century. Fossils entered the cave over long periods, and carnivores, water, sediment movement and nineteenth- and early twentieth-century excavation disturbed the deposits. A cave can be a den, trap, refuge, drainage route and natural archive all at once. Individual bones are valuable evidence, but their original relationships are often difficult to recover.

One specimen has particular significance for a year-by-year account. A reindeer femur from Castlepook has been reported as dating to about 33,000 years ago and bears a deep mark interpreted by Ruth Carden as having been made with a sharp stone tool during butchery. County Cork heritage material consequently presents it as possible evidence of Palaeolithic hunters handling reindeer in the area around 31,000 BCE. If that interpretation is sustained, it would push Irish evidence for human activity dramatically earlier than the long-established post-glacial record.

But the limits of the claim are as important as its promise. The bone was recovered from an old cave collection rather than a modern excavation of an intact occupation surface. No securely associated hearth, dwelling, lithic assemblage, human burial or food-processing area of comparable age has yet been found at Castlepook. The radiocarbon result dates the death of the animal, not automatically the making of the mark, the place of killing or the duration of any human visit. The identification of a mark as a tool cut is a separate specialist judgement. Accordingly, the bone can responsibly be described as a potentially crucial trace of human butchery, not proof of a permanent settlement or continuous population in Ireland.

Animals, Habitat and Climate

The animal evidence nevertheless establishes something substantial: Ireland was not an empty abstraction before the great ice advance. Reindeer are well adapted to open, cold landscapes; lemmings and Arctic fox point towards severe conditions; while giant deer, brown bear, hyaena and mammoth indicate that the ecological picture changed through time and contained more than one habitat or climatic phase. In north-west Europe, Marine Isotope Stage 3 was marked by abrupt shifts between colder stadials and relatively milder interstadials. Conditions could alter over timescales far shorter than traditional historical periods.

It is safest to envisage a mosaic rather than a fixed national landscape. Open grassland, herb-rich steppe-tundra, sparse shrub cover, exposed ground and sheltered valleys may all have existed in changing proportions where land was ice-free. There is no basis for placing dense forest across Ireland at this date.

Nor should modern Irish greenery be projected backwards: the familiar Atlantic landscape of broadleaf woodland, deep soils, bogs and settled fields belonged to much later environmental histories. The coastline was also unlike that of today. Global sea level was lower during the Ice Age, but local geography around Ireland was shaped as well by crustal movement and ice loading. Whether particular routes between Ireland, Britain and the continental mainland were passable at a given stage remains a complex palaeogeographical question, not a licence to assume an easy land bridge.

People: A Fleeting Possibility

If humans did process the Castlepook reindeer, they were almost certainly highly mobile hunter-gatherers rather than settlers in any modern sense. Their presence may have been brief: a hunting party, a carcass-processing episode, a seasonal movement along animal routes or an exploratory journey. Such possibilities are interpretations drawn from the nature of Upper Palaeolithic lifeways elsewhere in north-west Europe; they are not directly demonstrated in Ireland. We cannot identify their language, ancestry, community name, beliefs, clothing, boats, shelters or route of arrival from a single modified bone.

Even the word “economy” needs careful handling here. There is no evidence for farming, herding, pottery, metalworking, permanent fields, markets or long-distance trade within Ireland around this date. If people were present, subsistence would have depended on immediate access to wild plants, animals and raw materials, with hunting and scavenging both conceivable in an environment where predators also used caves. A stone edge capable of cutting bone would imply knowledge of lithic technology, but no tool can presently be tied securely to the Castlepook femur. Ireland’s older isolated finds cannot fill that gap, because some may have been carried by glacial ice rather than made or used on the island.

No Politics, No Recorded Conflict

There were no known Irish kingdoms, chiefs, tribal names, laws, diplomatic agreements or political institutions in 31,953 BCE. There is equally no Irish evidence for organised warfare. Predation, hunting and competition for shelter were facts of Ice Age ecology, but they should not be converted into stories of human conflict. A hyena-marked mammoth bone and a possibly cut-marked reindeer bone illuminate different processes affecting carcasses; neither reveals a battle, a frontier or a social hierarchy.

Religion, art and learning are similarly beyond direct recovery in Ireland at this point. Across Europe, Upper Palaeolithic communities made sophisticated tools, ornaments and art, but it would be methodologically unsound to transfer any particular tradition, cave imagery or ritual practice to Ireland without local evidence. No Irish cave art, figurative object, inscription or ceremonial structure has been securely dated to this period. The absence of such evidence is not proof that people lacked imagination, custom or knowledge; it is a reminder that archaeology must distinguish what is possible from what has been found.

The Meaning of This Date

31,953 BCE is important not because it contains a recoverable Irish event, but because it lies near a threshold in the island’s deep past. It belongs to a period when Ice Age animals demonstrably reached Ireland, when the island’s physical geography and climate were in flux, and when one Castlepook reindeer

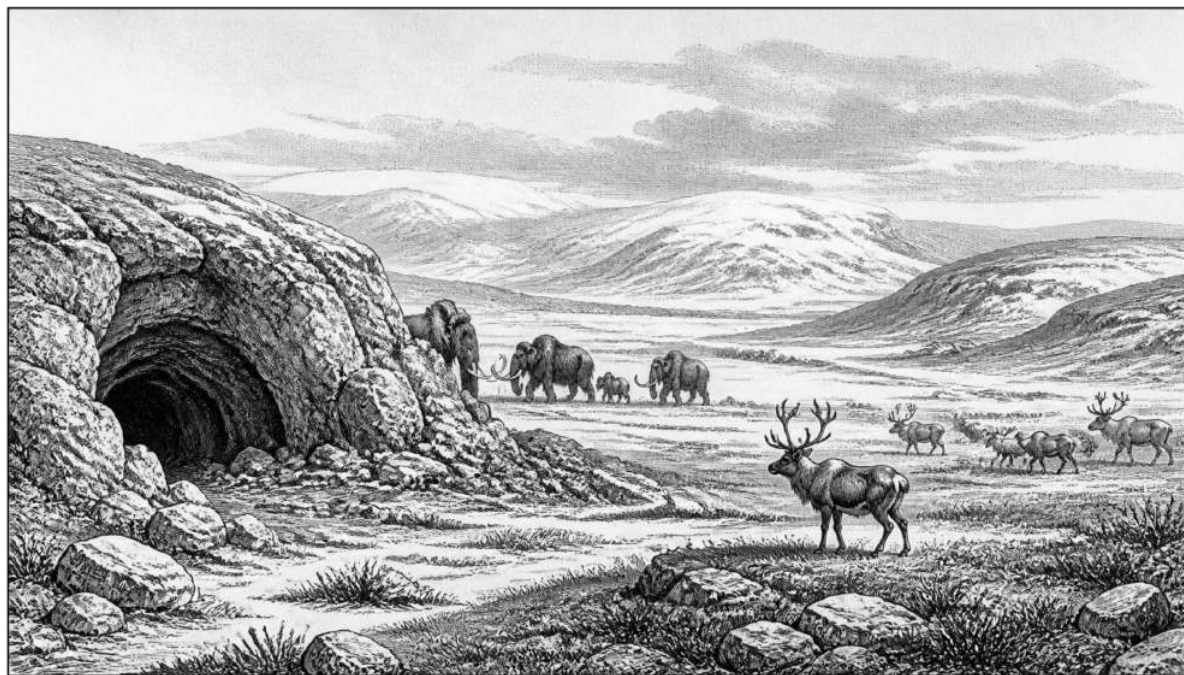
bone may preserve the earliest known sign of human activity. Future excavation, microscopic study of bone surfaces, refined radiocarbon calibration and reassessment of old museum collections may strengthen, revise or overturn that interpretation.

For now, the sound conclusion is deliberately modest. Around this notional year, at least some parts of Ireland supported cold-climate fauna within a changing Late Pleistocene environment. The island was moving towards more extensive glaciation, whose erosive force would later obscure much of the evidence. Human presence is possible and may be indicated by the Castlepook femur, but settlement, society and culture remain unproven. This is not a blank page in Irish history; it is a fragmentary one, read chiefly through ice, caves and animal bone.

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31952 BCE

Southern Irish Raised Beaches^[49]



The label 31,952 BCE is a modern chronological convenience, not a year that anyone living in Ireland could have named or recorded. It is roughly 33,900 years before the conventional radiocarbon baseline of AD 1950, but archaeological and environmental evidence cannot be assigned to a single calendar year at this depth of time. The responsible view is therefore regional and approximate: this point falls within the Late Pleistocene, during Marine Isotope Stage 3, a long and unstable phase of the last Ice Age. Evidence from Ireland is sparse, much of it recovered long ago from caves and later re-examined. It can illuminate the island's changing climate, wildlife and possible human visitation; it cannot provide an annal of a particular year.

An Island in a Cold Age

Ireland at this time was not the familiar green, wooded island of later millennia. The climate was cold, variable and embedded in the larger North Atlantic world of advancing and retreating ice. The British-Irish Ice Sheet was growing during the later part of Marine Isotope Stage 3, but the exact extent and timing of ice across every Irish region remain subjects of continuing research. Reconstructions broadly place the decisive build-up of the ice sheet after about 35,000–32,000 years ago, with its maximum extent later, around 27,000–21,000 years ago. Thus 31,952 BCE belongs not simply to a moment when 'Ireland was under ice', but to a changing glacial landscape in which ice margins, exposed ground, sea level and habitats could differ considerably from place to place.

Southern Ireland preserves important clues to this complexity. Raised-beach and shallow-marine deposits demonstrate that parts of the south coast experienced changing relative sea levels during Marine Isotope Stages 4 and 3. Offshore geomorphology, sediment cores and dating programmes have transformed understanding of the ice sheet's later expansion and retreat, but they do not yield a map

precise enough to describe conditions in one valley in one year. The safest conclusion is that the Irish landscape was increasingly severe and unstable, yet still included habitable, at least seasonally accessible, terrain before the later glacial maximum overwhelmed much of the island.

Castlepook and the Fossil Record

The most important Irish locality for imagining this period is Castlepook Cave near Doneraile in north County Cork. Excavated in the early twentieth century, its passages produced a remarkable assemblage of Pleistocene animal remains. Woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, spotted hyaena, mountain hare, stoat and lemmings are among the animals identified from the cave deposits. This is compelling evidence that cold-adapted and open-country fauna reached Ireland during phases of the Ice Age. It also warns against picturing a uniform polar desert. At least in favourable intervals, Ireland contained enough food, shelter and connected terrain to support a varied large-mammal community.

Yet Castlepook must be handled with care. Its bone deposits were excavated before modern standards of sediment recording, and the cave system accumulated material over long periods. Some remains may have been moved, mixed or introduced from different phases of the Pleistocene; a few identifications and associations have been reconsidered by later researchers. A radiocarbon determination on a mammoth bone, published as $33,400 \pm 1,200$ radiocarbon years before present, placed part of the assemblage broadly in the Middle Devensian or Late Pleistocene. That is valuable chronological evidence, but it is not a date for every bone, every species or every episode represented in the cave.

The animal list nevertheless conveys an important ecological reality. Reindeer and lemmings point towards cold, largely open vegetation; Arctic foxes and mountain hares reinforce that impression. Mammoths would have needed extensive feeding grounds, while wolves and spotted hyaenas were predators and scavengers within that wider food web. Brown bears and giant deer remind us that Ice Age environments were mosaics rather than simple modern analogies. There may have been patches of grassland, herb-rich steppe-tundra, scrub and sheltered valley habitat, varying with local soils, exposure, seasons and the advance of ice. The evidence supports a landscape capable of sustaining animals; it does not allow a precise reconstruction of its trees, flowers or weather on 31,952 BCE itself.

The Question of People

The most consequential, and most tentative, question is whether people visited Ireland around this broad period. For much of the twentieth century, the accepted archaeological position was that Ireland had no convincing Palaeolithic human record and that sustained settlement began only in the Mesolithic, around 8000 BCE. The later discovery at Alice and Gwendoline Cave, County Clare, of cut marks on a brown-bear kneecap dated to about 12,810–12,590 calibrated years before present demonstrated earlier Late Upper Palaeolithic human activity. It proved that the search for Ireland's first people could not be confined to later Mesolithic sites.

Castlepook has extended that debate further. A fragment of reindeer femur from the cave has been reported as bearing marks consistent with butchery by a stone tool and as dating to about 33,000 years ago. If the modification is confirmed as human-made and securely related to the bone's age, it would indicate human activity in Ireland far earlier than the Clare bear bone and broadly near the era addressed here. It would be a major discovery: not evidence of a large settled population, but evidence that Upper Palaeolithic people reached, hunted or processed carcasses in what is now Ireland.

That conditional language matters. The reported Castlepook find comes from an old collection rather than a newly excavated, sealed occupation layer. No securely associated hearth, stone-tool assemblage, dwelling floor, human bone or repeated series of butchered animals has yet been published to establish a settlement at the cave. A cut-marked bone can show an encounter between people and an animal; it cannot on its own reveal how many people were present, whether they lived nearby, how long they stayed, or whether the animal was hunted rather than scavenged. Around 31,952 BCE, human presence in Ireland should therefore be described as possible and under investigation, not as a settled historical fact.

Movement, Not a Nation

If people did enter Ireland during this period, they would have been small, mobile Upper Palaeolithic hunter-gatherer groups, not members of any known Irish ‘tribe’, kingdom or nation. There is no evidence for rulers, political institutions, warfare, diplomacy, fixed territorial boundaries or named communities. Nor can archaeology identify a language, kinship system, gender roles or religious belief for Ireland at this date. Continental and British Upper Palaeolithic archaeology shows that contemporary *Homo sapiens* possessed sophisticated stone technologies, social networks and symbolic cultures, but it would be unsafe to transfer any particular tool tradition, artwork or ritual automatically across the sea to Ireland without an Irish context.

Travel itself is uncertain. Lower global sea level altered the geography of north-west Europe, exposing areas now submerged, while local relative sea level was affected by the weight and movement of ice. Possible land connections and ice routes between Ireland, Britain and continental Europe have long been debated. A mainland route cannot be assumed for every phase, nor can water crossings be excluded. The key point is that Ireland’s position at the Atlantic edge made arrival difficult but not impossible. Animal movements demonstrate that ecological connections existed at some stages; they do not by themselves demonstrate a human migration route.

Everyday Survival

For any visiting people, the practical economy would have centred on acquiring food, fuel, shelter and workable raw materials in a cold environment. Reindeer would have offered meat, fat, hide, sinew, antler and bone; mammoth, where encountered, represented an immense but risky source of food and materials. Predators would have demanded vigilance, and winter conditions would have placed a premium on local knowledge and mobility. Caves such as Castlepook could provide shelter or serve as natural traps and carnivore dens, but their very use by bears and hyaenas makes them ambiguous archaeological settings. No direct Irish evidence from this date demonstrates camps, clothing, boats, storage, exchange networks or the regular use of a particular route.

There is equally no securely Irish evidence for art, formal burial, ceremony or teaching at 31,952 BCE. That absence should not be confused with an absence of culture. Hunter-gatherer life depended upon learned knowledge: reading animal tracks, locating stone, anticipating weather, preserving food and passing skills between generations. Archaeology simply cannot recover those practices in detail here. The later glacial advance compounded the problem, eroding, burying and reworking many ancient surfaces. Coastal landscapes that might once have contained camps or travel corridors now lie beneath the sea, while surviving cave collections retain only a partial and often disturbed record.

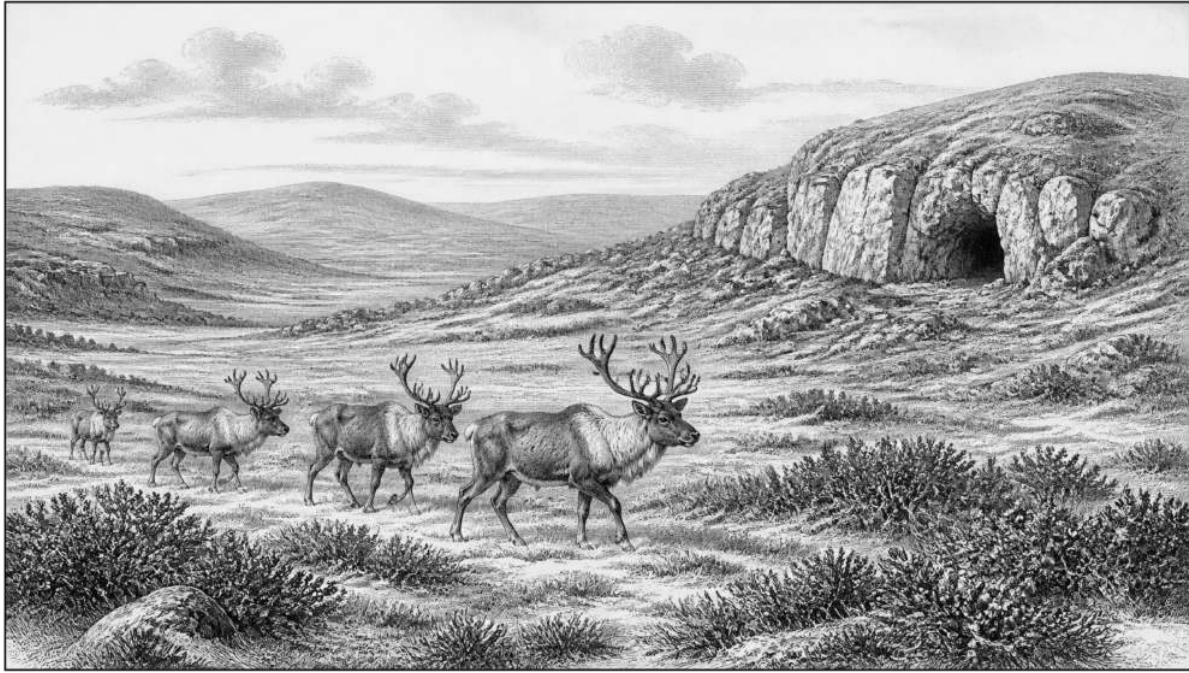
What This Date Can Mean

The chief historical significance of 31,952 BCE is not an identifiable Irish event but a threshold of possibility. Ireland was entering the harsher trajectory that would culminate in the Last Glacial Maximum. Before that transformation was complete, parts of the island supported an Ice Age fauna of exceptional richness, documented especially at Castlepook Cave. A reported cut-marked reindeer bone raises the prospect that Upper Palaeolithic people were among those moving through this landscape, although the claim still requires stronger contextual confirmation. The evidence therefore supports a cautious, vivid conclusion: this was an Ireland of cold grasslands, caves, great animals and unstable horizons—one that may already have been visited by people, but whose human story remains largely beyond the resolution of modern dating.

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31951 BCE

Southern Ice-Free Ground^[50]



“31,951 BCE” is a modern chronological label, not a year in which an event in Ireland can be dated with calendar precision. For so remote a period, archaeologists and Quaternary scientists normally work with radiocarbon ages expressed as years before present (BP, conventionally AD 1950), calibrated calendar ranges, stratigraphy and environmental proxies. This date lies roughly 33,900 calendar years before present, in the Late Pleistocene, within Marine Isotope Stage 3 and the wider Upper Palaeolithic age of Europe. It falls before the Last Glacial Maximum, not within a historical sequence of named rulers, peoples or recorded events.

The responsible question, therefore, is not what happened on one day or in one numbered year, but what the incomplete evidence can say about the island around this broad interval. The answer is necessarily cautious. Ireland was entering a colder, unstable phase of the last glacial cycle, and its landscape supported Ice Age animals at least during parts of the preceding and contemporary millennia. There is no securely excavated house, hearth, burial, stone-tool assemblage or human skeleton from Ireland that can be assigned to c. 31,951 BCE. Nor is there evidence for a continuously resident human population at this date.

A Pre-Maximum Ice Age

The date belongs to the long approach to the Last Glacial Maximum, when the British–Irish Ice Sheet eventually reached its greatest late-glacial extent, broadly between about 26,000 and 19,000 years ago. Its advance was neither instantaneous nor uniform. Research on southern Ireland indicates that substantial expansion of the last ice sheet followed initially ice-free conditions around 34,000 years ago, with ice

reaching the south coast much later, after about 24,000 years ago. Other reconstructions emphasise regional complexity: mountain ice, advancing ice margins and changing sea conditions did not necessarily produce the same landscape in Cork, Fermanagh, the midlands and the northern coast at the same time.

Thus Ireland around 33,900 calibrated years ago should not simply be pictured as an island buried beneath a single, permanent sheet of ice. It was a cold north-western European landmass facing increasing climatic severity and, later, major glaciation. Low global sea levels enlarged the exposed coastal shelf and altered routes between Ireland, Britain and continental Europe, but the precise geography of crossings changed repeatedly with ice and sea level. Animal dispersal shows that connections or viable passages existed at intervals; it does not prove that a dry, easy land bridge was available at this exact moment, still less that people used one.

Landscape and Wildlife

The strongest direct evidence for this deep period comes from caves and from bones preserved in museum collections, especially in the south of the island. Castlepook Cave, near Doneraile in north County Cork, is exceptionally important: Geological Survey Ireland describes it as the country's richest known site for vertebrate fauna leading up to the Last Glacial Maximum. Antiquarian excavations recovered a substantial but imperfectly documented collection, later studies showing that its deposits represent more than one episode and cannot be treated as a single frozen moment in time.

The Castlepook record includes animals associated with cold and open Pleistocene environments: reindeer, woolly mammoth, brown bear, spotted hyaena, wolf, Arctic fox, hare and lemmings, as well as deer. Not all need have lived together, and individual species have different date ranges, but the assemblage establishes that Ireland had supported a far richer large-mammal fauna than the later Holocene island. Redating of southern Irish cave material places important faunal evidence in Marine Isotope Stage 3; it suggests, for example, that giant deer and spotted hyaena may have disappeared locally before the climatic maximum.

Plants are harder to reconstruct for precisely this date, because Ireland has comparatively few securely dated terrestrial environmental sequences from the middle of the last glaciation. A valuable northern comparison comes from Derryvree in County Fermanagh, where organic freshwater sediments dated to about 30,500 radiocarbon years BP contained floral and faunal evidence interpreted as open tundra under a periglacial climate. That evidence is later than the nominal year considered here and should not be mistaken for an annual report from 31,951 BCE. It nevertheless supports the wider interpretation that open, sparsely wooded or treeless cold-climate habitats were characteristic of the region during severe phases of this period, rather than the dense green woodland familiar in modern Ireland.

Such terrain would have been dynamic. Freeze–thaw action broke exposed rock; seasonal water and sediment moved through valleys and into caves; glaciers and ice streams later eroded, buried and redeposited parts of the older landscape. Many of the drumlins, eskers, corries, U-shaped valleys and widespread deposits of till now associated with Ireland record repeated Quaternary glaciations, though they do not individually date to this one year. The future shape of much of the island was being prepared by processes far more consequential than any recoverable human action.

The Fragile Human Clue

There is one potentially transformative clue close in age to this period. A reindeer femur from the old Castlepook collection has been reported as dating to about 33,000 years ago and as carrying a deep mark interpreted by its investigator as having been made by a sharp stone tool during butchery. County Cork's heritage publication presents it as evidence for Palaeolithic hunters processing reindeer, while also noting that the animal may have been butchered outside the cave and the discarded bone later carried inside by hyaenas or wolves. This is the nearest direct evidence relevant to human activity in Ireland around the early 30,000s BCE.

Its importance must be matched by restraint. The specimen comes from an early excavation, not a modernly excavated occupation surface with recorded layers, tools and hearths. A radiocarbon result dates the animal's death, within a statistical range; it does not alone date a human visit, establish where butchery occurred or identify the people involved. Cut marks require microscopic assessment and must be distinguished from carnivore damage, trampling, sediment movement, old excavation damage and later handling. Current investigation at Castlepook is explicitly seeking stratified deposits, lithics, cave art and further modified bone because those finds would test, refine or challenge the striking interpretation placed on this single specimen.

If the mark is confirmed as human-made, the most that can responsibly be inferred is a brief Upper Palaeolithic human presence or animal-processing episode somewhere in Ireland during the general pre-maximum Ice Age. It might represent a small mobile hunting party following reindeer, rather than a settlement. It cannot support claims for an Irish village, a permanent colony, a named ethnic group or a continuous ancestry from these visitors to later inhabitants. No securely dated Irish stone tools can yet tie such an episode to a particular Upper Palaeolithic tradition known from Britain or continental Europe.

No Politics, No Recorded Culture

Political affairs, diplomacy and warfare cannot be recovered for Ireland at this date. There are no written sources, monuments, settlements, graves or territorial markers from which to identify leaders, communities, alliances or conflicts. Terms such as "tribe", "kingdom" and "Irish people" would import much later concepts into a record that does not justify them. Equally, there is no Irish evidence from c. 31,951 BCE for formal religion, ceremonial sites, cave art, schools, artistic traditions or systems of learning. Upper Palaeolithic societies elsewhere in Europe produced striking art and sophisticated technologies, but those continental achievements must not be projected automatically across the Irish Sea.

The same limit applies to economy and trade. The possible modification of a reindeer bone permits discussion of butchery, meat and perhaps hide, sinew or marrow extraction; it does not demonstrate a local economy, regular hunting system or exchange network. The cave fauna shows an ecosystem in which large herbivores and predators moved through the landscape. It does not prove that humans routinely exploited them. Nor can the movement of animals be converted into evidence for trade, seafaring or organised migration.

Why the Silence Matters

Ireland's scarcity of early Palaeolithic evidence is itself historically significant. Later ice sheets were destructive agents: they scoured bedrock, reworked sediments and could remove or conceal open-air traces. Subsequent sea-level rise drowned extensive former coastal landscapes and shelf areas where

people, if present, may have travelled or camped. Caves preserve bones unusually well, but their deposits can be mixed by water, slope wash, animals and generations of excavation. The result is an archive shaped as much by survival and discovery as by the actual distribution of life in the Late Pleistocene.

That is why museum collections and renewed cave work matter so greatly. The Irish Quaternary Fauna Project demonstrated that a broad range of mammals had reached Ireland between at least about 45,000 and 20,000 years ago, while modern accelerator mass spectrometry, sediment analysis and re-excavation continue to revise older assumptions. At Alice and Gwendoline Cave in County Clare, for example, later research has provided firm evidence for humans only in the terminal Pleistocene, around 12,700 calibrated years BP, illustrating both the potential and the chronological limits of Irish cave archives.

For 31,951 BCE, then, the central development was environmental rather than political: an increasingly cold Ireland on the threshold of the great ice advance, inhabited demonstrably by Ice Age fauna and perhaps visited by people. The reindeer bone from Castlepook is a compelling lead, not a complete human history. Its proper lesson is that deep Irish prehistory remains open to discovery, but that evidence, interpretation and speculation must remain carefully distinct.

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31950 BCE

Before Maximum Ice^[51]



31,950 BCE is not a year for which Irish history can be written in the ordinary sense. It is a modern, backward-counted calendar label, roughly 33,900 years before the conventional radiocarbon reference year of AD 1950, not a date that can be matched to an Irish event, ruler, settlement or season. No written record exists; no named person can be recovered; and neither archaeological nor geological dating can normally resolve Ireland’s Late Pleistocene past to a single calendar year. The responsible frame is therefore a span around this nominal date, expressed through radiocarbon determinations, calibrated ranges where available, and the broader Late Pleistocene sequence.

In archaeological terms, this was the Upper Palaeolithic, within the last cold stage of the Pleistocene. In Irish glacial terminology it falls in the Midlandian; in the wider North Atlantic chronology it belongs to Marine Isotope Stage 3, before the Last Glacial Maximum. That maximum was later: research places the greatest expansion of the British–Irish Ice Sheet broadly between about 27,000 and 19,000 years ago, although its timing and shape varied by region. Around 31,950 BCE, Ireland was moving through a harsh, unstable Ice Age world whose landscapes, coastlines, plants and animal communities were very different from those of the modern island.

A Date Beyond Calendar Precision

It is important not to turn the number 31,950 BCE into false precision. Radiocarbon laboratories report ages in radiocarbon years before present, with statistical uncertainty; calibration against independently dated records translates these into calendar ranges that can be broad, especially this far back. Geological evidence is often less precise still, dating an advance, retreat, sediment layer or exposed rock surface within centuries or millennia. Consequently, “Ireland in 31,950 BCE” means Ireland in the vicinity of a notional point in time, not a documented year.

The evidence is also uneven. The last ice sheet removed, reworked and buried much of the older ground surface. Later erosion, rising seas and the acidic conditions that commonly destroy bone and wood on open land have reduced what survives. Limestone caves are exceptional because they can preserve animal remains and sediments. Yet cave deposits have their own difficulties: bones may have been dragged in by predators, washed through passages, disturbed by later animals, or excavated before modern recording standards existed. The absence of an open-air camp from this period cannot prove that no human ever entered Ireland; equally, it cannot be used to invent a settled population.

A Cold, Open Landscape

The most secure picture is environmental. Inland Ireland was not the wooded country familiar today. Evidence from Derrynvree in south Fermanagh, where freshwater silts and sands produced a radiocarbon age of $30,500 \pm 1,170/1,030$ BP, indicates open tundra vegetation and periglacial conditions in a comparable part of the middle Midlandian cold phase. Plant remains and pollen point to sparse herbaceous ground cover, mosses, sedges and grasses, with dwarf shrubs and willows in suitable niches. Pollen from trees can travel great distances, so isolated grains of pine or hazel do not demonstrate local woodland.

This evidence should not be stretched into a detailed weather report for every county in 31,950 BCE. Conditions differed with altitude, exposure, drainage and the changing position of ice. Nevertheless, a generally treeless mosaic of tundra, steppe-like grassland, bare sediment, frost-shattered slopes and wet ground is a more defensible image than forest or permanent agricultural pasture. Winter cold, strong winds and short productive seasons would have constrained animals and people alike. Rivers carried glacial sediment, while repeated freezing and thawing broke rock and moved soil downslope.

Ireland was also geographically unlike its present form. Global sea level was lower because vast quantities of water were stored in ice sheets, exposing portions of the continental shelf. But low sea level did not automatically make a simple dry route from Ireland to Britain or continental Europe. Irish Sea bathymetry, changing ice margins, glacio-isostatic movements of the land and marine channels made connectivity complicated. The long-standing assumption of an easy Irish land bridge has been challenged by marine and sea-level research. At this date, travel between landmasses cannot responsibly be described as a straightforward walk; water, ice and dangerous coastal terrain could all have been formidable barriers.

Animals of the Ice Age

Irish cave collections demonstrate that this was a land capable, at least at intervals, of supporting a striking cold-climate fauna. Castlepook Cave, near Doneraile in north County Cork, is especially important. Material recovered there includes remains attributed to woolly mammoth, reindeer, giant deer (*Megaloceros giganteus*), brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. The giant deer is often called the “Irish elk”, but that popular name is misleading: it was neither confined to Ireland nor a close relative of modern elk.

These finds do not establish that all those species stood together outside the cave at one moment. Castlepook accumulated remains over a long period, and carnivores were major agents in the formation of bone deposits. Spotted hyaenas, in particular, could transport carcass parts and leave material in dens. A mammoth bone, a hyena jaw and a reindeer limb may represent different episodes separated by very long intervals. What the assemblage securely shows is the existence of an Ice Age animal world in Ireland before the later maximum glaciation, rather than a single perfectly reconstructable ecosystem.

For animals, as for people, regional change was decisive. Ice-sheet reconstructions show that expansion did not occur as one uniform white blanket advancing everywhere at once. Some uplands may have retained cold-based ice or exposed summits, while other sectors were overtaken by erosive, moving ice. The western, southern, central and Irish Sea sectors have produced evidence that has prompted competing reconstructions. By the Last Glacial Maximum, much or all of Ireland was substantially covered by ice, and the ice sheet extended beyond the modern shoreline in several directions. That later expansion destroyed or concealed much of the landscape relevant to this earlier period.

The Fragile Human Trace

The question of people is the most compelling and the least secure. Castlepook has yielded a reindeer femur fragment reported to bear chop marks consistent with cutting by a sharp stone tool and to date to about 33,000 years ago. If the marks are correctly identified as anthropogenic and the dated bone belongs to the same episode of modification, the find offers evidence of human handling of a reindeer remarkably close to the nominal date considered here. It would push possible human activity in Ireland far earlier than the formerly accepted Late Upper Palaeolithic evidence from County Clare.

Its significance demands caution rather than certainty. The fragment comes from an old cave collection and is not part of a modern, tightly excavated activity floor. No securely associated hearth, dwelling, human burial, stone-tool assemblage or butchery area of the same age has yet been recovered. A cut-marked bone can suggest an encounter, a kill-site visit or carcass processing; it cannot establish a village, continuous residence, population size, language, kinship system or migration route. It is therefore best treated as a potentially momentous but very small human footprint.

That distinction matters because Upper Palaeolithic people elsewhere in north-west Europe were highly capable hunters and makers of sophisticated stone, bone and antler equipment, but Ireland need not have shared every feature of their lives simply because it lay at the edge of their world. If people reached southern Ireland around this time, they may have been mobile foragers exploiting seasonal opportunities, perhaps focused on large game and familiar with hides, meat, marrow, sinew and bone. That is an inference from the practical requirements of cold-climate hunting and from the possible reindeer processing at Castlepook, not direct evidence for an Irish camp or household.

No Politics, No Trade Networks

There were no demonstrable political affairs in Ireland at this date. Archaeology supplies no chiefs, tribes, territories, alliances, wars or diplomatic encounters. Nor is there evidence for farming, herding, metallurgy, pottery, monuments, formal burial rites, ritual structures, art or literacy. It would be misleading to fill these absences with imagined Ice Age clans or religious ceremonies. The archaeology is simply not rich enough.

The same restraint applies to economy and trade. A single possible butchered bone does not reveal exchange networks or regular commerce. Hunting and scavenging, if people were present, would have been forms of subsistence rather than an economy documented by stores, settlements or traded goods. Any connection with Britain or mainland Europe remains a hypothesis about movement across a changing glacial seascape, not evidence for sustained contact. At most, the wider European Upper Palaeolithic provides a comparative context showing that human groups elsewhere possessed the knowledge to travel, cooperate and process animal resources under severe conditions.

What This Year Represents

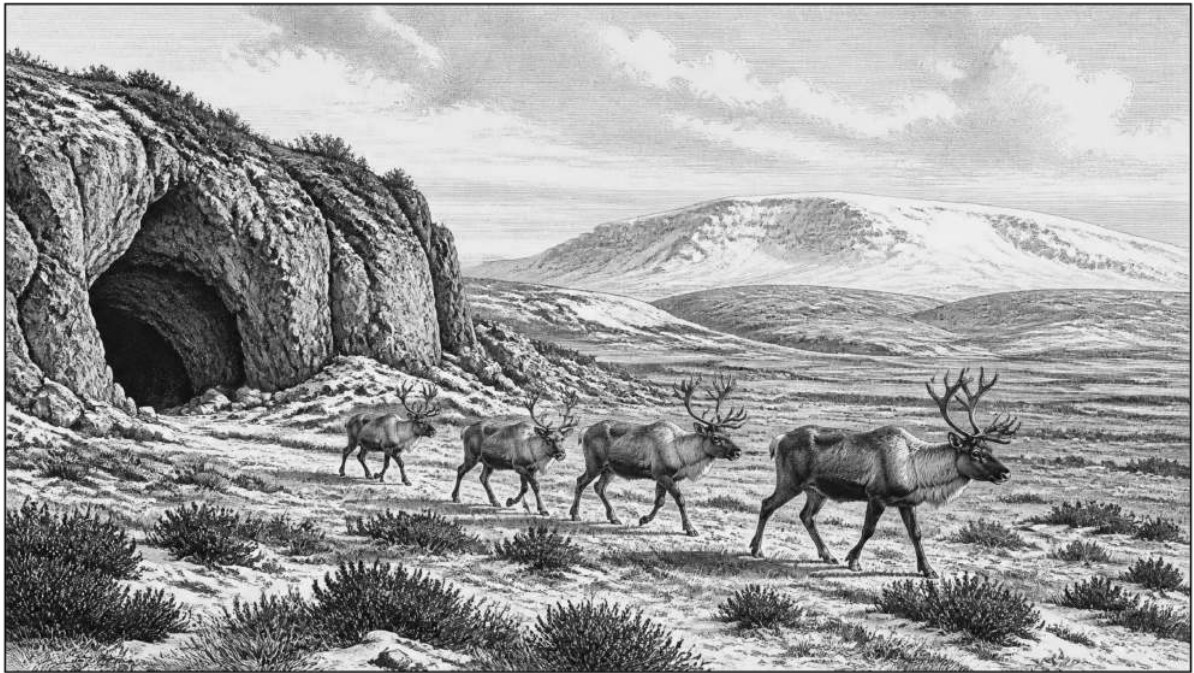
The historical importance of 31,950 BCE lies not in an event but in a threshold of possibility. Ireland was an Arctic-fringed, open and changing land before the greatest advance of the last ice sheet. Its caves preserve proof of animals now absent from the island, while Fermanagh sediments preserve a rare glimpse of tundra vegetation. Castlepook Cave may preserve an even more consequential clue: a reindeer bone that could record human butchery at roughly this remote time.

For now, however, the evidence supports neither a founding population nor a continuous Irish occupation. It supports a landscape of cold, mobile ice and open ground; an intermittent fauna of mammoth, reindeer, giant deer, predators and small Arctic-adapted mammals; and the possibility of brief human presence at Europe's western edge. Future cave excavation, microscopic study of bone modification, improved radiocarbon pretreatment, ancient DNA and submerged-landscape research may change that picture. The honest story of Ireland around 31,950 BCE is therefore one of deep time, severe environment and a tantalising trace rather than a named chapter of human history.

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31949 BCE

Crag Cave Interstadial^[52]



The label 31,949 BCE offers a useful point on a modern chronological scale, but it must not be mistaken for a date that Ice Age people in Ireland could have recognised, or that archaeologists can identify as a discrete historical year. There were no written records, named communities, calendars, states or documented events on the island. In archaeological terms, this notional year falls broadly around 34,000 calibrated years before present (cal BP; “present” conventionally means 1950), within the Late Pleistocene and Marine Isotope Stage 3. At this depth of time, calibration ranges and regional environmental sequences are more responsible than a claim about one particular year.

At the Edge of a Changing Ice Age

Ireland lay on Europe’s Atlantic north-western fringe during a climatically unstable phase of the last Ice Age. It was not yet the fully ice-covered landmass of the Last Glacial Maximum, generally placed at about 26,000–19,000 cal BP, but the conditions that would produce that maximum were gathering strength. Research on the British–Irish Ice Sheet indicates that ice expansion was already under way in parts of the wider archipelago by about 31,000 years ago. Its precise limits earlier in the sequence are uncertain, and Ireland’s conditions were not uniform. Uplands, northern districts, Atlantic margins and lower southern landscapes could have had sharply different local histories.

The best interpretation for a point around 31,949 BCE is therefore neither a wholly frozen Ireland nor a mild, wooded one. Southern Ireland appears to have retained ice-free ground during portions of late Marine Isotope Stage 3, while glaciers and ice caps were developing elsewhere. Speleothem evidence from Crag Cave in County Kerry supports phases suitable for cave-calcite formation between roughly

38,000 and 34,000 years ago and again between 32,000 and 30,000 years ago. Such evidence does not produce a weather report for a single day or season, but it shows that southern Irish environments were changing rapidly rather than remaining locked in one immutable condition.

Sea level was considerably lower than today because immense quantities of water were stored in continental ice sheets. Reconstructions for about 31,000 years ago suggest levels broadly 50–100 metres below the modern shoreline around Britain and Ireland. The coastlines were consequently displaced, with wider coastal plains in some areas. Yet it would be rash to draw a simple road map between Ireland, Britain and continental Europe. The shape, width and passability of sea passages altered through time, and no Irish evidence from this period demonstrates the route by which animals—or any people—might have reached the island.

Castlepook and the Animal World

The most important Irish archive for this remote interval is Castlepook Cave, also called Mammoth Cave or Doneraile Cave, near Doneraile in north County Cork. Excavations and later investigations recovered a remarkable collection of Pleistocene animal remains. Geological Survey Ireland describes it as Ireland's richest known vertebrate-fauna site for the period leading towards the Last Glacial Maximum. The wider cave record includes reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena.

That list needs careful handling. The cave contains deposits formed across a long span, not a sealed snapshot of life in 31,949 BCE. Some bones were excavated in the late nineteenth and early twentieth centuries, when recording standards were unlike those now expected; later work has also shown that old radiocarbon determinations may need revision. Water, sediment movement, scavenging animals and previous excavation can mix material within caves. A mammoth bone, a lemming jaw and a reindeer limb recovered from Castlepook should not automatically be imagined as parts of one herd, one season or one human encounter.

Even so, the fauna securely establishes the kind of ecological world that could exist in Ireland during the broader pre-maximum interval. Reindeer and lemmings point towards cold-adapted, open habitats. Mammoth and giant deer indicate that, at intervals, the landscape could sustain very large grazers and browsers. Wolves and spotted hyaenas reveal a food web in which carcasses might be hunted, scavenged, dragged into caves and gnawed by predators. Open grassland, herb-rich steppe-tundra and patchy vegetation are better-supported descriptions than later images of dense Irish woodland. Local sheltered valleys and limestone country would nevertheless have differed greatly from exposed uplands or ground near advancing ice.

The Question of Human Presence

Castlepook has become central to discussion of the earliest possible human activity in Ireland. A reindeer femur from the cave has been reported as approximately 33,000 years old and as carrying marks interpreted as resulting from butchery with a sharp stone tool. If that interpretation is sustained by continued study, it would carry the Irish human story far beyond the formerly accepted Late Upper Palaeolithic evidence and make a brief human presence conceivable in the period surrounding this article's notional year.

It is an important claim, but it is not the same as proof of an established population. The bone derives from an old cave collection rather than a modern excavation of an intact living floor. No securely associated hearth, stone-tool assemblage, dwelling, human burial or repeatedly used animal-processing area of comparable age has been recovered from Castlepook. The scientific date measures when the reindeer died, within an uncertainty range; the identification of a surface mark as a human tool cut is a separate taphonomic judgement. The responsible conclusion is that the specimen may record a human visit or butchery episode, not that Ireland possessed a permanent settlement in 31,949 BCE.

This distinction matters because Ireland's better-established early human evidence is much later. At Alice and Gwendoline Cave in County Clare, a brown-bear kneecap bearing fresh butchery marks has been independently dated to 12,810–12,590 cal BP and 12,810–12,685 cal BP. That find provides strong evidence for people on the island after the severe glacial phase. It also illustrates the standard Castlepook must meet: direct dating, close study of the marks, and a transparent account of context. Further excavation and redating at Castlepook may clarify the earlier claim, but archaeology should preserve the difference between a promising indication and a demonstrated settlement history.

Society Without a Settlement Record

Nothing in the Irish record allows named leaders, tribes, political territories, diplomatic relations or battles to be assigned to this time. There is no evidence for organised government, formal boundaries, warfare or alliances on the island. Nor can the presence of large animals be turned into a story of human hunting: hyaenas, wolves, bears, natural deaths and water transport all help explain why bones accumulated in caves.

If people did reach Ireland, comparison with Upper Palaeolithic groups in neighbouring north-west Europe suggests that they would most likely have travelled in small, mobile foraging parties, making flexible decisions around weather, prey and safe routes. This is an inference, not an Irish discovery. The roughly contemporary burial at Paviland in south Wales, dated to about 33,000–34,000 years ago, includes ochre, perforated shells and worked mammoth ivory. It demonstrates that communities in the surrounding region could make ornaments and attach social or ceremonial importance to the dead. It cannot, however, prove that visitors to County Cork used the same objects, held the same beliefs or maintained direct contact with Paviland.

Accordingly, religion, art, language, learning and trade remain unknown for Ireland itself. No cave art, figurine, burial, pigment, ornament, worked bone or imported stone of this age has been securely identified on the island. There is likewise no evidence for farming, herding, permanent houses, fields, boats or exchange networks. The only plausible economy that can be cautiously envisaged, if the Castlepook marks are anthropogenic, is opportunistic use of wild animal resources by highly mobile people. Whether a reindeer was killed locally, scavenged, processed at the cave entrance or transported there cannot presently be decided.

A Landscape Before Recorded Ireland

The greatest development around 31,949 BCE was environmental rather than political: the transition towards harsher glacial conditions that would later erase or bury much of the physical record. Ice and later erosion make the survival of archaeological sites exceptionally unlikely. Caves such as Castlepook are therefore disproportionately valuable, but they are also difficult archives whose deposits require

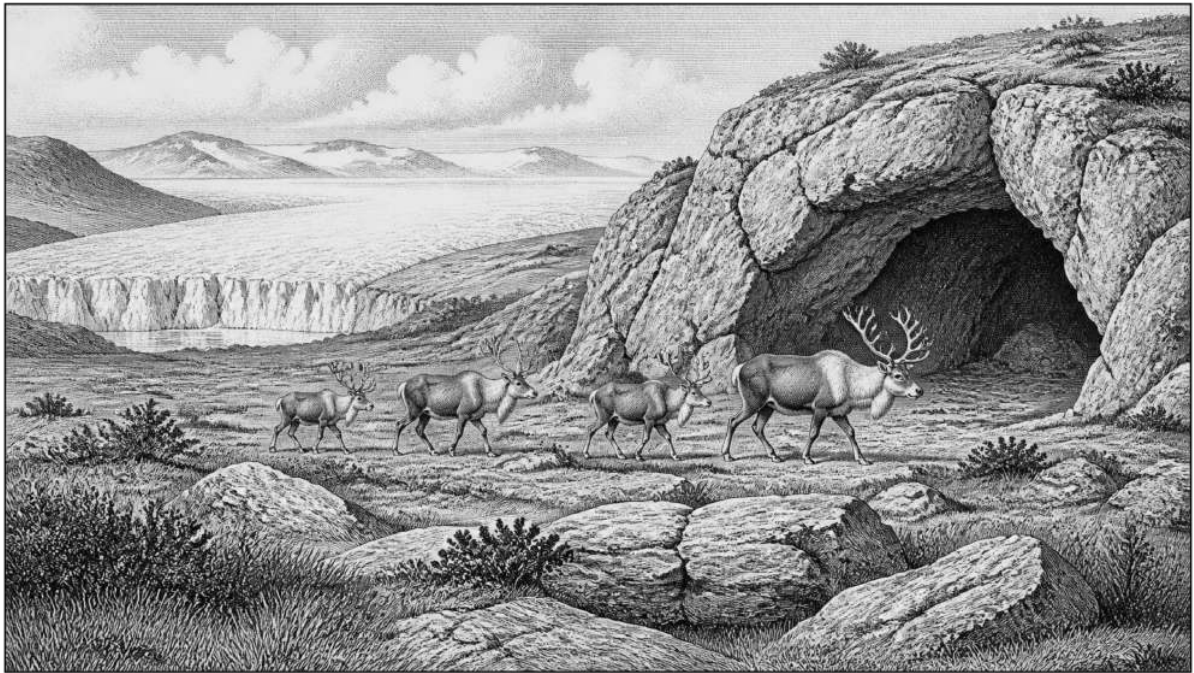
painstaking separation and dating. Their evidence reveals an Ireland intermittently capable of supporting Ice Age mammals and perhaps visited by people, while leaving open the larger question of whether human occupation occurred at all.

This is not an empty chapter in Irish history; it is a chapter written chiefly in bones, cave sediments, ice-sheet reconstructions and calibrated probabilities. Around this notional year, Ireland was a changing cold-world landscape on the verge of profound glaciation. Its most compelling human story is not yet a secure narrative of settlement, but a carefully tested possibility: that a small number of Upper Palaeolithic people may have reached its southern edge long before the island's later, demonstrable recolonisation.

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31948 BCE

Before the Ice Peak ^[53]



“31,948 BCE” is a modern chronological label, not a year that can be recovered from Ireland’s prehistoric record. No written testimony, named person, settlement, political event or calendar date can be assigned to it. This article therefore concerns Ireland at roughly 34,000 calendar years before 1950, within the Late Pleistocene. Even that formulation requires caution: radiocarbon results are measured with statistical uncertainty and then calibrated; geological sequences are normally resolved over centuries or millennia rather than individual years. The evidence can illuminate a changing Ice Age world, but not the experience of a particular day, season or generation.

In broad archaeological terms, this was the Upper Palaeolithic era in Europe, but Ireland cannot responsibly be described as an Upper Palaeolithic society. The securely documented human story of the island begins far later, after the last great ice-sheet expansion and subsequent environmental recovery. Around 31,948 BCE, the central subject is not an Irish people, kingdom or culture, but the conditions that would have constrained animal movement, possible human visits and the survival of physical evidence.

An Island in a Glacial World

The date falls in Marine Isotope Stage 3, a cold and climatically unstable part of the last glacial cycle, before the fullest development of the Last Glacial Maximum. The British–Irish Ice Sheet was not a fixed white blanket advancing everywhere at one speed. Ice expanded and contracted in distinct sectors, responding to climate, snowfall, sea level, topography and the behaviour of fast-flowing ice streams. Large reconstructions of the ice sheet identify the period from about 31,000 to 15,000 years before present as one of growth, maximum extent and retreat, with maximum ice volume and many outer margins reached later, broadly during the mid-20,000s years before present.

It is consequently unsafe to draw a precise ice margin for Ireland in 31,948 BCE. Some regional reconstructions indicate substantial pre-maximum glaciation, while the detailed scale and timing of ice cover remain debated, especially for earlier phases. What can be said is that Ireland lay in the north-western fringe of Eurasia during an increasingly severe glacial episode. Its mountains, lowlands, western Atlantic approaches and Irish Sea basin did not necessarily share identical conditions. Ice, periglacial ground, seasonal snow, cold grassland and exposed rock may all have occurred in different combinations across the wider island and its now-submerged margins.

Sea level was much lower than today because water was stored in continental ice sheets. The modern coast is therefore a poor guide to the geography of the time: broad continental-shelf areas were dry land or shallow, changing marine environments. Yet low sea level should not be turned into a simple claim that Ireland was joined by an easy land bridge to Britain or continental Europe. Connections and barriers changed through time, and the Irish Sea region was shaped by water, glaciers, sea ice, exposed terrain and difficult routes. For animals and any human parties, crossing into the Irish region was a practical ecological problem, not merely a line on a map.

What the Landscape Can Preserve

The strongest direct evidence for this deep period is geological and palaeontological. Landforms such as drumlins, moraines, meltwater channels and glacial lineations record the enormous power of later ice movement. Offshore seismic survey and sediment cores add an essential archive, because they preserve evidence beyond the present coastline. These sources show that the ice sheet eventually extended to, or near, the continental shelf break in several sectors. They also show why the archaeological record is so thin: advancing ice eroded, redeposited and buried older deposits, while later sea-level rise drowned many former coastal landscapes.

Caves are exceptionally important because they can retain animal bone and sediments through episodes that destroyed more open-air evidence. Irish cave collections, many recovered in nineteenth- and early twentieth-century excavations and subsequently reassessed, demonstrate that Late Pleistocene Ireland supported a broader fauna than the modern island. The Irish Quaternary Fauna Project found evidence for mammals colonising Ireland between at least about 45,000 and 20,000 years ago, although deposits are often disturbed and individual bones cannot automatically be treated as a single contemporary assemblage.

Castlepook Cave near Doneraile in County Cork is especially significant. It has yielded one of Ireland's richest Pleistocene faunas, including remains attributed to animals such as woolly mammoth, reindeer, giant deer, brown bear and spotted hyena. These finds prove that parts of Ireland were available to sizeable mammals at intervals during the Late Pleistocene. They do not prove that every species occupied County Cork in 31,948 BCE, nor that they shared the same valley at the same moment. The responsible picture is of a patchy fossil record, dated samples and changing faunal communities rather than an imagined, fully stocked Ice Age landscape.

Climate, Animals and Everyday Ecology

If ice-free ground existed locally, vegetation would have been shaped by low temperatures, short growing seasons, wind exposure and repeated climatic fluctuations. Open herb-rich grassland, sedge and shrub tundra are more plausible general comparisons than the dense Atlantic woodlands familiar from later prehistory. Such environments could support grazing and browsing animals, while carnivores

followed prey or scavenged carcasses. But the exact plant cover of a specific Irish hill or plain in this numbered year is beyond present resolution. Pollen, cave sediments, animal remains, marine cores and landforms provide indirect environmental proxies, each with its own geographical and chronological limits.

This ecological setting had no agriculture, livestock keeping, permanent villages or managed fields in Ireland. There is no evidence for cereal cultivation, domestic animals, pottery, metalworking, monumental tombs or built ritual centres at this time. Those practices belong to much later Irish prehistory. Nor should the later Mesolithic, which began only after final deglaciation and ecological recolonisation, be projected backwards. The familiar archaeological signs of everyday life—hearths, lithic scatters, huts, middens, burials and worked wood—have not been securely demonstrated in Ireland for around 31,948 BCE.

Accordingly, it is impossible to describe households, food preparation, clothing or seasonal routines as Irish facts. If people ever entered the island during an earlier ice-free interval, they would have belonged to mobile Upper Palaeolithic hunter-gatherer populations known elsewhere in north-west Europe. That is an inference from neighbouring regions, not evidence for a resident Irish community. Any visit would have faced formidable constraints: cold weather, unpredictable access, sparse or shifting animal resources, and terrain altered by ice and meltwater. It is more accurate to speak of possible transient exploration than of an established population.

Human Presence: Absence, Possibility and Proof

Ireland's earliest currently recognised direct evidence for human activity is vastly later than the focal date. A butchered brown-bear patella from Alice and Gwendoline Cave, County Clare, has been radiocarbon dated to the terminal Pleistocene, about 12,810–12,590 calibrated years before present. More recent work at the cave has refined its complex depositional history and stresses that many bones were washed or moved into the site from above. That research is valuable precisely because it demonstrates both the potential and the interpretative difficulty of cave evidence.

The later date should not be misrepresented as proof of people in Ireland 20,000 years earlier. At present there is no comparably secure artefact, cut-marked bone or occupation deposit dating to about 31,948 BCE. The lack of such evidence cannot conclusively establish that no human ever set foot on Irish ground: later ice action and sea-level rise created an exceptionally destructive filter. Nevertheless, archaeological method requires a distinction between what might have happened and what is demonstrated. Possible early visits remain possible; a documented population, political community or cultural tradition does not.

No Politics, but Powerful Boundaries

There is therefore no evidence for political affairs, diplomacy or organised warfare in Ireland at this date. Terms such as tribe, chieftdom, alliance and territory imply social structures that the Irish record cannot identify here. Nor can animal predation or competition for shelter be translated into “conflict” in the historical sense. The meaningful boundaries were environmental: ice fronts, cold seas, river valleys, exposed shelves, caves and the distribution of food. These regulated who—or what—could move through the region.

Trade and exchange are equally untraceable. Continental Upper Palaeolithic groups maintained long-distance networks of stone, shells, pigments and other materials, but no such network can be located in Ireland at this time. The absence of evidence matters most when the claim would require a durable human

presence. There are no securely dated Irish tools, ornaments, pigments, carvings or structures through which to identify learning, language, artistic traditions or religious practice. It would be misleading to supply cave art, shamanic ceremonies or clan identities merely because they are known elsewhere in Ice Age Europe.

The Long View

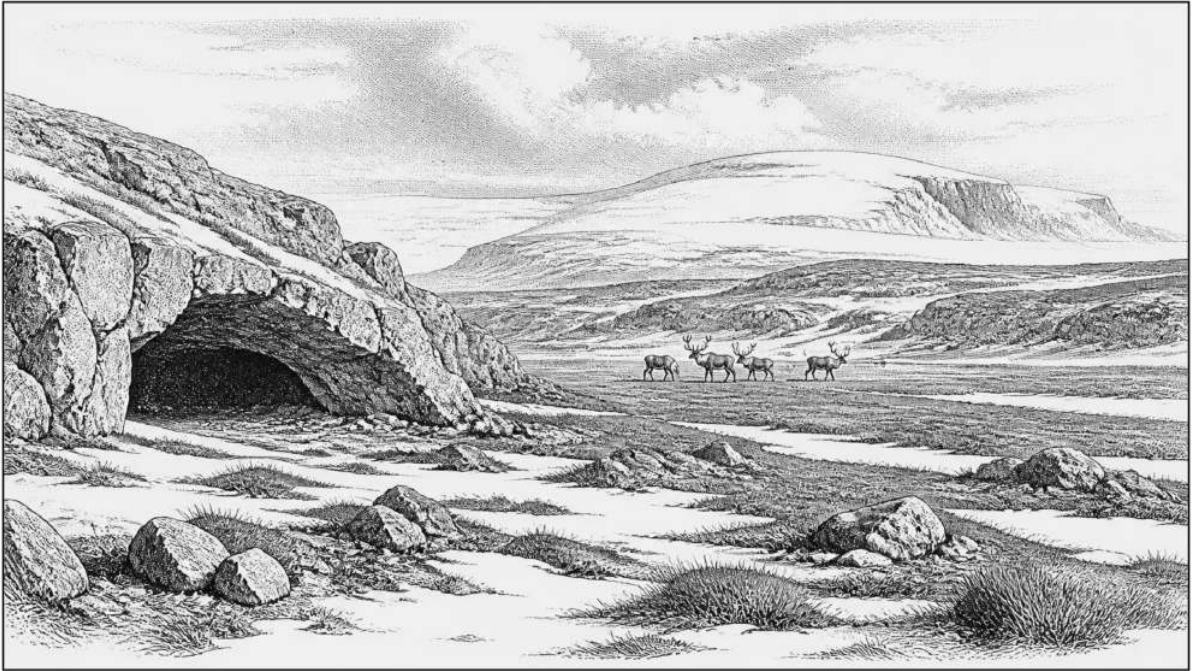
The importance of around 31,948 BCE in Irish history lies in conditions rather than events. Ireland was part of a volatile north-west European glacial world, approaching the interval in which the British-Irish Ice Sheet would reach its greatest extent. Its physical geography was being remade: ice and meltwater sculpted landforms, lower seas altered coastlines, and later glaciation removed much of what might once have survived. Fossil-bearing caves offer glimpses of changing animal life, while also warning against overly neat reconstructions.

The future human history of the island was not yet in place. The first securely evidenced human traces, the Mesolithic settlement of the postglacial landscape, farming, monuments, languages and political communities all lay millennia ahead. For this date, the most truthful year-by-year account is necessarily modest: a cold, changing Ireland; substantial but regionally uncertain ice growth; evidence of Pleistocene animal habitats across a broader time span; and no reliable proof of a contemporary human society. That restraint is not a gap in the story. It is the historical result revealed by the surviving evidence.

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31947 BCE

Ice and Uncertainty^[54]



The label 31,947 BCE is useful as a point on a modern timeline, but it cannot identify a witnessed Irish ‘year’ in the historical sense. No written calendars, named people, settlements or events survive from this depth of time. In archaeological terms, it falls in the later Pleistocene, broadly within Marine Isotope Stage 3 and during the long build-up towards the Last Glacial Maximum. Converted only approximately, it lies around 33,900 calibrated years before present. Even that formulation must be handled cautiously: radiocarbon measurements, calibrated age ranges, ice-sheet models and cave deposits provide spans of time, not annual precision. The responsible question is therefore not what happened in Ireland in one exact year, but what the evidence can say about the island and its inhabitants—human and animal—around this phase of the Ice Age.

A Changing Ice-Age Island

Ireland was not yet simply the ice-covered land often imagined for the peak of the last glaciation. The British–Irish Ice Sheet reached its greatest overall volume much later, around 23,000 years ago, while its expansion was uneven and regionally complex. Research reconstructing the ice sheet suggests that from roughly 34,000 years ago ice was building across parts of Britain and Ireland. At about 31,000 years ago, modelled reconstructions show centres of ice accumulation on high ground, including Northern Ireland, but acknowledge major uncertainty in the exact margins. Thus, around the nominal date of 31,947 BCE, conditions could have differed dramatically between districts: uplands and northern areas may have supported expanding ice, while other zones retained exposed ground, lakes, rivers, caves and cold grassland.

This is an important corrective to any single map of ‘Ice Age Ireland’. Sediments beneath later glacial deposits in County Fermanagh indicate that north-central Ireland was ice-free until at least about 34,000 years ago. Evidence from western coasts and offshore sediments likewise records a fluctuating relationship between ice, sea and land before the Last Glacial Maximum. These records establish broad environmental possibilities rather than a day-by-day weather report. They show an island in transition: climatic cooling was encouraging glacier growth, but the ice sheet had not yet assumed the maximum extent that later reshaped much of the landscape.

Landscapes Beyond the Later Ice

The Ireland of this period was colder, more open and less wooded than the familiar green island of recent millennia. Treeless or sparsely vegetated ground, grass-herb communities, patches of scrub and exposed rock would have formed habitats suited to cold-adapted animals. Rivers drained landscapes repeatedly altered by frost, snow, meltwater and shifting sea levels. Coastlines were also unlike those of today, because global sea level was much lower during the glacial cycle. Yet it would be wrong to draw a precise shoreline, or to assume a straightforward land bridge to Britain or continental Europe, for this particular date. Sea crossings, exposed shelves and routes across the north-west European landscape changed over long intervals and remain subjects of reconstruction.

The later advance of ice removed, buried and reworked many older surfaces. That geological history helps explain why archaeological evidence is exceptionally scarce. Open-air camps may have been destroyed by glacial erosion, concealed beneath later deposits, or now lie offshore beneath post-glacial seas. Limestone caves are consequently precious archives: they can preserve bones, sediments and occasional traces of activity that vanished elsewhere. But caves are not sealed time capsules. Water, burrowing animals, collapse, excavation practices and later human use can mix deposits. Every find therefore requires careful dating, analysis of context and comparison with other evidence.

The Castlepook Fauna

Castlepook Cave near Doneraile in north County Cork is central to understanding Ireland’s Middle Devensian, or later Pleistocene, fauna. Investigations and museum collections from the cave have produced remains attributed to animals including woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, lemmings and spotted hyaena. The assemblage demonstrates that, during parts of the period before the Last Glacial Maximum, Ireland supported or was reached by a strikingly different range of mammals from that of the present island. It evokes a cold, open environment in which large herbivores and carnivores could move through a wider north-west European ecological zone.

That list must not be turned into a single, crowded scene set in one year. Cave collections accumulated over time, and some deposits were disturbed or contain material of different ages. The value of Castlepook lies precisely in its potential to be re-examined using modern radiocarbon dating, zooarchaeology and stratigraphic methods. Published reassessments have stressed both the importance of the site and the complications created by antiquarian excavation. The fossils support the existence of cold-stage animal communities in Ireland; they do not allow historians to specify which animals stood in County Cork in 31,947 BCE, nor how many there were.

A Possible Human Trace

The most directly relevant, but still limited, claim concerns a reindeer femur from Castlepook Cave. In 2021, it was reported that the bone, dated to about 33,000 years ago, bore marks interpreted as cuts or chops made with a stone tool. If that interpretation and dating are upheld by fuller publication and contextual study, the find would place a human visit to Ireland broadly close to the timespan represented by this article—far earlier than the well-established Mesolithic settlement of the island after the ice retreated.

It is not evidence for a settled Irish population, a village, a hunting territory or a continuous occupation. No securely dated hearth, dwelling, lithic assemblage, burial or art site of this age has yet been demonstrated in Ireland. A modified animal bone could represent a short hunting, scavenging or butchery episode by a small mobile group. It cannot reveal the group's name, language, origin, route, social organisation or duration of stay. Ongoing research at Castlepook is therefore particularly significant: it may clarify whether this is an isolated encounter, part of a wider but almost erased Upper Palaeolithic presence, or an interpretation requiring revision.

The distinction matters because the island's better-supported early human record is much later. A butchered brown-bear kneecap from Alice and Gwendoline Cave, County Clare, has been independently radiocarbon dated to approximately 12,810–12,590 calibrated years before present, demonstrating terminal-Pleistocene human activity. More substantial evidence for repeated settlement appears later still, in the Mesolithic, from around 8000 BCE. The chronological gulf between these records should not be filled with imagined generations of inhabitants.

Society Without a Recorded Society

There is no evidential basis for political affairs, diplomacy, chieftains, tribes, warfare, formal religion, learning or trade within Ireland at this date. Neither monuments nor durable objects demonstrate ceremony, exchange networks or territorial authority. If people did enter Ireland around this time, they belonged to Upper Palaeolithic hunter-gatherer worlds known elsewhere in Europe, where mobility, seasonal knowledge, stone technology and co-operation were essential. That wider comparison can suggest possibilities, but it cannot be substituted for Irish evidence. It would be an interpretation, not a fact, to assign those practices to a particular Irish group.

The same restraint applies to everyday life. The Castlepook evidence permits a cautious picture of people potentially processing reindeer in a cold landscape; it does not identify their clothing, shelters, kinship, beliefs or diet beyond that possible act. Mammoth, reindeer and other animal remains illuminate ecology more securely than human custom. The economic language appropriate here is subsistence opportunity rather than an Irish economy: large mammals could have offered meat, fat, hide, bone and antler, but no excavated Irish camp demonstrates how such resources were organised or shared.

What This Date Means

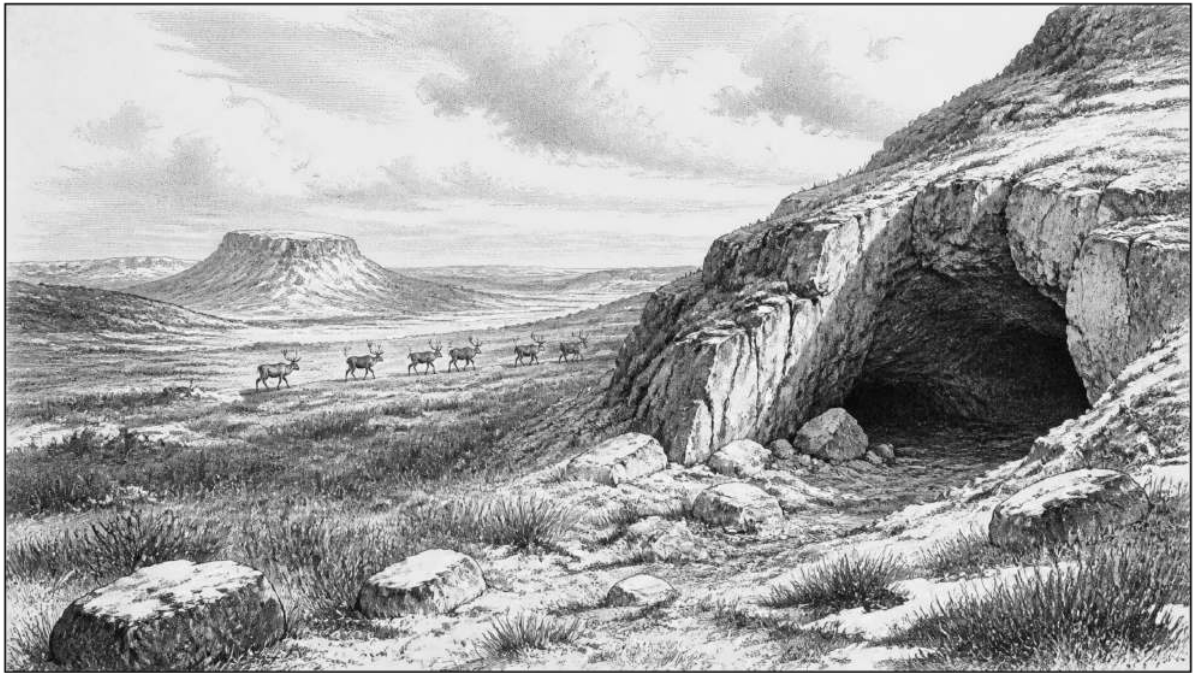
For Ireland, 31,947 BCE marks neither a founding moment nor a datable event. It sits near the beginning of a severe climatic transformation, when ice was expanding across parts of the island and its surrounding seas, while some landscapes may still have sustained Pleistocene fauna. The most important development is environmental: the approach of the glacial maximum would profoundly remodel Ireland, erase earlier surfaces and later set the conditions from which post-glacial ecosystems emerged. The

possible Castlepook evidence gives this remote period an added human significance, but only as a carefully qualified prospect of brief Upper Palaeolithic activity. Around this point in time, Ireland's history is written chiefly in ice margins, cave sediments and animal bone—and in the disciplined acknowledgement of what those fragments cannot yet tell us.

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31946 BCE

Greenagho Ice-Free Deposits^[55]



The label *31,946 BCE* creates a false impression of precision. No event in Ireland can be assigned to that single modern calendar year, and no contemporary people used such a calendar. In archaeological terms, this point lies roughly 34,000 calendar years before present (where “present” conventionally means 1950), in the Late Pleistocene and Marine Isotope Stage 3. Radiocarbon measurements from this depth of time must be calibrated and normally produce ranges rather than anniversaries. The responsible question is therefore not what happened in Ireland in one exact year, but what the evidence can reveal about the island during the millennia around it.

An Uncertain Moment in a Cold Age

Ireland then stood on the threshold of the last great expansion of the British–Irish Ice Sheet. It was not yet simply the ice-covered island of popular imagination. Geological evidence from beneath later glacial deposits at Derryvree and Greenagho in County Fermanagh indicates ice-free conditions in north-central Ireland until at least about 34,000 years ago. The calibrated ranges are broad: organic material at Derryvree falls within c. 36,900–31,700 cal BP, while material at Greenagho falls within c. 37,200–35,700 cal BP. They establish an environmental sequence, not the weather or shoreline of a particular year.

This matters because the date in question lies close to the edge of that evidence. It is reasonable to describe parts of Ireland as probably still ice-free, or only beginning to experience the build-up of the last ice sheet; it would not be responsible to map a fixed ice margin across the whole island. Later evidence shows the bulk of the Irish Ice Sheet expanded from conditions that had been substantially more open at around 34,000 years ago, and eventually reached a far greater extent during the Last Glacial Maximum. Across the wider British–Irish system, ice advance and maximum extent were asynchronous: different sectors advanced, thickened and retreated at different times.

The climate was cold and unstable rather than uniformly frozen. Marine Isotope Stage 3 contained abrupt northern climatic oscillations, recorded especially clearly in Greenland ice cores. Ireland's exposed position at the Atlantic edge of north-west Europe made it sensitive to such shifts. Local glaciers may have occupied uplands, snowfields may have lasted long into the year, and periglacial processes would have repeatedly frozen, heaved and disturbed exposed ground. Yet ice-free ground, lakes, rivers, caves and coastal margins could still support plants and animals during milder intervals. The landscape was one of changing opportunities and hazards, not a static white wilderness.

What the Land May Have Looked Like

There is no pollen diagram that permits a detailed reconstruction of every Irish valley at this date. Nevertheless, the cold-climate fauna recovered from southern Irish caves shows that open environments existed in at least some regions during Marine Isotope Stage 3. Such habitats are more likely to have resembled tundra, herb-rich grassland and sparsely vegetated ground than the dense temperate woodland that would cover much of Ireland after the Ice Age. Shrubs, grasses, sedges, mosses and hardy flowering plants would have formed patchy communities shaped by altitude, drainage, exposure and rapid climate change.

The most informative archive is Castlepook Cave, near Doneraile in north County Cork. Its old collections and later re-dating have shown that Irish cave deposits can preserve evidence of animals living long before the Last Glacial Maximum. The material includes species associated with cold or open conditions, notably reindeer, giant deer and spotted hyaena. Brown bear and other mammals also belonged to Ireland's shifting Pleistocene fauna. These animals should not be imagined as a single herd or community photographed at one moment: cave assemblages accumulated over long periods and may include bones brought in by carnivores, water movement or other natural processes.

Spotted hyaenas are especially important to interpretation. Caves could be dens or places where scavengers dragged carcass parts, rather than shelters occupied by people. Reindeer remains point to a mobile grazing animal well adapted to cold landscapes; giant deer indicate that substantial herbivores also used parts of the island. Their presence demonstrates ecological possibility, but it does not tell us how numerous they were, whether they migrated seasonally, or precisely which habitats lay outside the cave entrance at any one time.

A Possible Human Footprint

Castlepook also supplies the most provocative evidence relevant to people. A reindeer femur from the cave has been reported as bearing deep marks consistent with cutting or chopping by a sharp stone tool, and it has been presented in Irish heritage research as dating to about 33,000 years ago, broadly near the period under discussion. If that interpretation is accepted, it would show a brief episode of human handling or butchery of a reindeer in Ireland during the Upper Palaeolithic.

Its importance should not be exaggerated. The bone was recovered during early twentieth-century cave excavation, not from a modern, intact living floor with a precisely recorded position. No securely associated hearth, stone-tool assemblage, shelter, burial, human bone, engraved object or repeated occupation surface has yet demonstrated a settled Irish community at this time. The date is the age of the animal bone, not automatically the date of the mark, the kill, a visit to the cave or a human arrival. Taphonomic study must distinguish deliberate tool damage from carnivore activity, trampling, breakage and post-depositional alteration.

Accordingly, the Castlepook bone is best understood as possible evidence for a fleeting human presence or carcass-processing episode, not proof of permanent population. That distinction is central to this period. Archaeology can support the suggestion that Upper Palaeolithic people reached, or occasionally used, parts of Ireland; it cannot yet support a history of villages, continuous ancestry or organised occupation in the 31940s BCE.

Society Beyond the Evidence

There is no direct Irish evidence from around this date for named groups, rulers, territories, laws, diplomacy or warfare. Political history, in the conventional sense, does not begin here. Nor is there evidence for farming, metalworking, pottery, monuments, writing or formal religious places in Ireland. The silence is not proof that people lacked social lives or beliefs; rather, it reflects the very small and disturbed archaeological record surviving from such an early phase.

Comparison with north-western Europe is useful only when its limits are kept clear. Groups elsewhere in Britain and continental Europe were mobile hunter-gatherers using carefully made stone tools, exploiting animal and plant resources, maintaining social ties over substantial distances, and sometimes making personal ornaments, images or formal burials. At Paviland Cave in south Wales, for example, an Upper Palaeolithic burial dates broadly to 33,000–34,000 years ago. Such sites show what contemporary *Homo sapiens* groups could do; they are not evidence that the same rituals, identities or artistic traditions existed in Ireland.

If people did reach Ireland, their economy would have depended on knowledge rather than infrastructure: the ability to move through cold country, choose stone suitable for sharp edges, read animal behaviour, process hides and meat, manage fire, and share practical information within a small travelling group. Reindeer would have offered meat, fat, hide, sinew, bone and antler. But even this is a conditional inference from one disputed or limited line of evidence, not a recovered Irish camp economy.

Water, Distance and Insularity

Lower global sea levels altered the geography of the north-west European shelf, but they did not automatically provide an easy land route into Ireland. Britain was at times part of a wider European landmass, while the Irish Sea basin and its glacial history created a more complicated barrier between Ireland and Britain. The precise routes, coastlines and sea crossings relevant to Marine Isotope Stage 3 remain uncertain. Later research strongly indicates that Ireland was already an island by the time substantial post-glacial settlement is visible, but that does not settle every earlier palaeogeographical question.

The apparent scarcity of evidence is therefore meaningful but not conclusive. Later glaciers scoured landscapes and redistributed sediments; rivers and slopes reworked deposits; rising seas drowned former coastal plains; and nineteenth- and early twentieth-century excavations removed or mixed material before modern recording standards existed. Caves have preserved rare fragments, but they are selective archives. A lack of known camps cannot prove that no short-lived camps ever existed on open ground now destroyed, buried or submerged.

The Long View

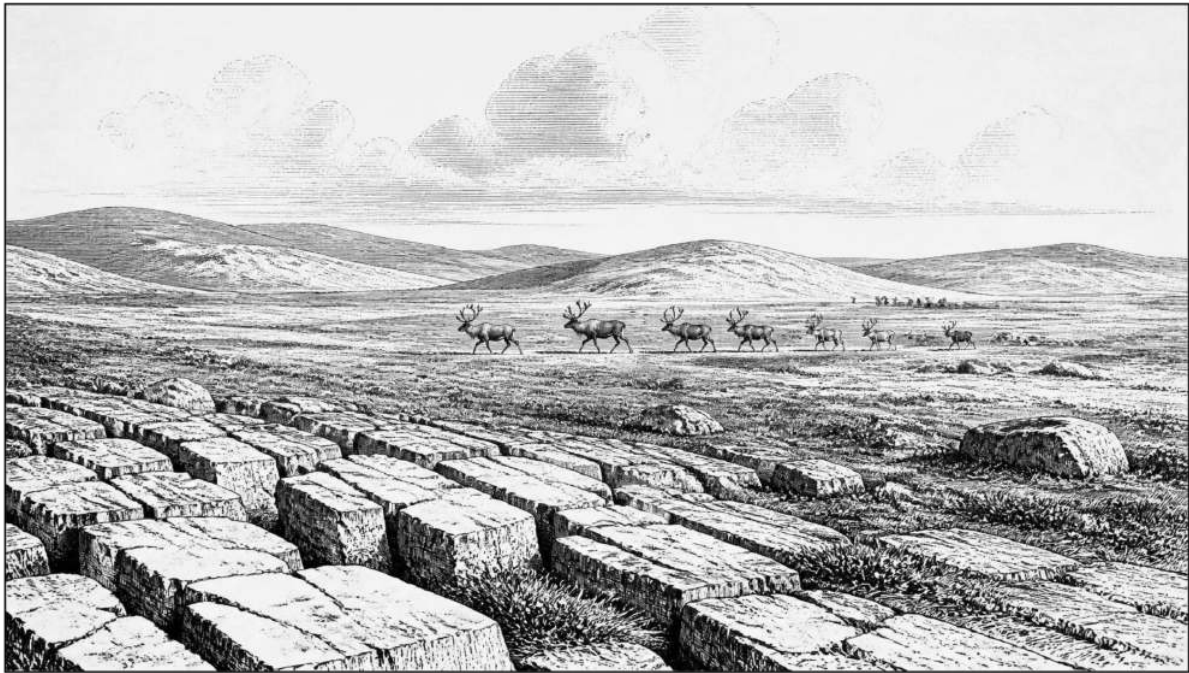
Around 31,946 BCE, Ireland's story is principally environmental. The island was entering the build-up to a glacial maximum that would profoundly reshape its terrain and interrupt or erase much earlier evidence. Fauna in places such as County Cork demonstrates that Ice Age ecosystems existed here before the maximum cold. The Fermanagh deposits show that the advance of the later ice sheet had not yet turned every region into an ice-covered landscape. Castlepook offers a tantalising, carefully qualified possibility that people briefly entered this world and butchered a reindeer.

That is enough to make the period significant. It pushes Irish history far beyond the older assumption that human activity began only after the retreat of the ice. But it also requires restraint. No Irish polity, battle, chief, ritual centre or settled culture can be placed in this year. The most accurate portrait is of a changing cold landscape, inhabited certainly by Pleistocene animals and perhaps visited by highly mobile people whose traces are almost vanishingly slight. Future excavation, improved bone dating and renewed study of old cave collections may refine that picture; for now, uncertainty is part of the history.

Chapter 056 of 100

31945 BCE

Glacial Erosion Legacy^[56]



The label “31,945 BCE” should not be mistaken for a date at which an Irish event can be placed. It is a modern, retrospective calendar expression, not a year recorded or experienced by people in Ice Age Ireland. Archaeologists and palaeoecologists instead work with radiocarbon ages and calibrated ranges, normally expressed as years before present (BP, where “present” is AD 1950). In simple arithmetic, 31,945 BCE lies about 33,895 years before 1950, but that conversion does not create year-level precision. At this depth of time, calibrated ages carry substantial ranges, deposits may be disturbed, and evidence often describes millennia rather than a single season. The responsible subject is therefore Ireland during the later part of the last Ice Age, within Marine Isotope Stage 3, rather than an invented occurrence in one numbered year.

An Island in the Last Ice Age

At roughly 34,000 calendar years before present, the land now called Ireland lay in a climatically unsettled phase before the Last Glacial Maximum. The maximum expansion of the British–Irish Ice Sheet came later, broadly between about 26,500 and 19,000 calibrated years BP, although ice had already been growing and advancing within the wider region. Reconstructions based on landforms, offshore sediments and dating are excellent for broad changes in ice-sheet extent, but they cannot give a weather report for 31,945 BCE. Nor do they justify imagining a uniformly frozen island at every moment before the maximum. Conditions varied over long and shorter climatic oscillations, while ice, snowfields, exposed ground, rivers and coastal margins changed their positions.

The eventual ice sheet profoundly shaped what can now be known. Moving ice eroded, transported and buried earlier sediments across much of Ireland. Later meltwater, changing coastlines, acidic soils and human disturbance removed or altered further traces. This is why the Irish Palaeolithic record is so sparse

in comparison with parts of Britain and continental Europe. The scarcity is evidence about preservation as well as about past population. Absence of hearths, tools and camps cannot, by itself, prove that no person ever visited Ireland; equally, it cannot be used to conjure a settled population where the archaeological record does not support one.

Caves and a Lost Fauna

The strongest direct evidence for this broad period comes not from houses or graves but from animal remains, especially those recovered from limestone caves in southern Ireland. Castlepook Cave, near Doneraile in County Cork, is central. Excavations there in the early twentieth century produced more than 2,000 bones, and subsequent radiocarbon work has shown that individual specimens span a very long interval, from roughly 45,700 to 19,950 BP. It is therefore not a single sealed Ice Age floor. Rather, the cave accumulated remains over many thousands of years, through processes that included animal activity, water movement, sediment transport and earlier excavation.

That qualification matters, but Castlepook still reveals an extraordinary Pleistocene fauna. Its collections include woolly mammoth, giant deer, reindeer, brown bear and spotted hyena, while other dated remains include wolves, Arctic foxes, mountain hares and lemmings. Such animals did not necessarily all live together in one local landscape or in one generation. The secure conclusion is more modest and more important: during different parts of the middle and later Ice Age, Ireland supported, or was reached by, animal communities far richer and colder-adapted than those of the modern island.

Other southern cave sites add depth to this picture. Re-dating of faunal material has pushed some Irish mammal evidence farther back into Marine Isotope Stage 3 and has shown why old radiocarbon determinations require critical reassessment. For example, published calibrated ranges for pre-Last Glacial Maximum red-deer specimens from Shandon and Ballynamintra caves fall between about 32,930 and 29,594 cal BP. This range is later than the notional year under discussion, but it demonstrates that the cave record preserves evidence from the same broad pre-maximum world. Mammoth, reindeer and giant deer fossils imply open or broken landscapes with extensive grazing opportunities; they do not supply a detailed map of vegetation, rainfall or seasonality for every Irish region.

The Question of People

The possibility of human activity around this remote horizon is particularly intriguing but must be stated with care. A reindeer bone from the Castlepook collection has been reported as bearing a mark interpreted as having been made by a sharp stone tool during butchery, and it has been presented publicly as evidence of human activity in Ireland around 33,000 BCE. If that interpretation is sustained, it would place a human visit to Ireland far earlier than the well-established terminal Palaeolithic evidence from County Clare, dating to about 12,810–12,590 cal BP. It would be an important discovery, but it is not evidence for a permanent settlement, a village or an unbroken ancestry to later Irish communities.

There are substantial limits. The relevant bone derives from an older cave collection rather than a modern excavation with a fully recorded stratigraphic context. No associated stone-tool assemblage, hearth, dwelling, human burial or securely contemporary group of butchered animals has yet provided a fuller social setting. Recent investigations at Castlepook have sought surviving Pleistocene deposits, illustrating both the site's importance and the difficulty of recovering undisturbed context after earlier

digging and natural disturbance. The prudent wording is that a modified reindeer bone may indicate a brief human presence in pre-maximum Ice Age Ireland; it does not tell us how many people arrived, where they came from, how long they stayed, or whether they returned.

Life Beyond the Evidence

For this reason, there is no responsible account of Irish political affairs in 31,945 BCE. No rulers, territories, laws, alliances, diplomatic contacts or named peoples are known. There is also no direct evidence for war, organised conflict, religious practice, language, art, schooling, trade or exchange networks in Ireland at this time. These are not omissions to be filled with romantic images of “tribes”. A single possible butchery mark cannot reveal authority, belief or identity. Even assigning visitors a particular archaeological culture known from Britain or mainland Europe would exceed the evidence unless diagnostic tools or securely dated sites are found.

Some carefully bounded inferences are possible. Any humans who reached Ireland in this cold, changeable world would have been mobile hunter-gatherers, dependent on knowledge of terrain, animal behaviour, weather and safe routes. A reindeer carcass, if indeed butchered by people, would have offered meat, fat, hide, sinew, bone and antler: useful materials in Upper Palaeolithic lifeways elsewhere in north-west Europe. But whether butchery happened at the animal’s death site, during a short stop, or before the bone entered the cave is unknown. It is also unknown whether travel occurred across exposed landscapes, sea ice, short water crossings, or some combination of routes. Lower sea level altered the geography of the Irish Sea, but the existence and timing of usable connections remain debated and cannot be assumed for this precise period.

Regional Change and Historical Meaning

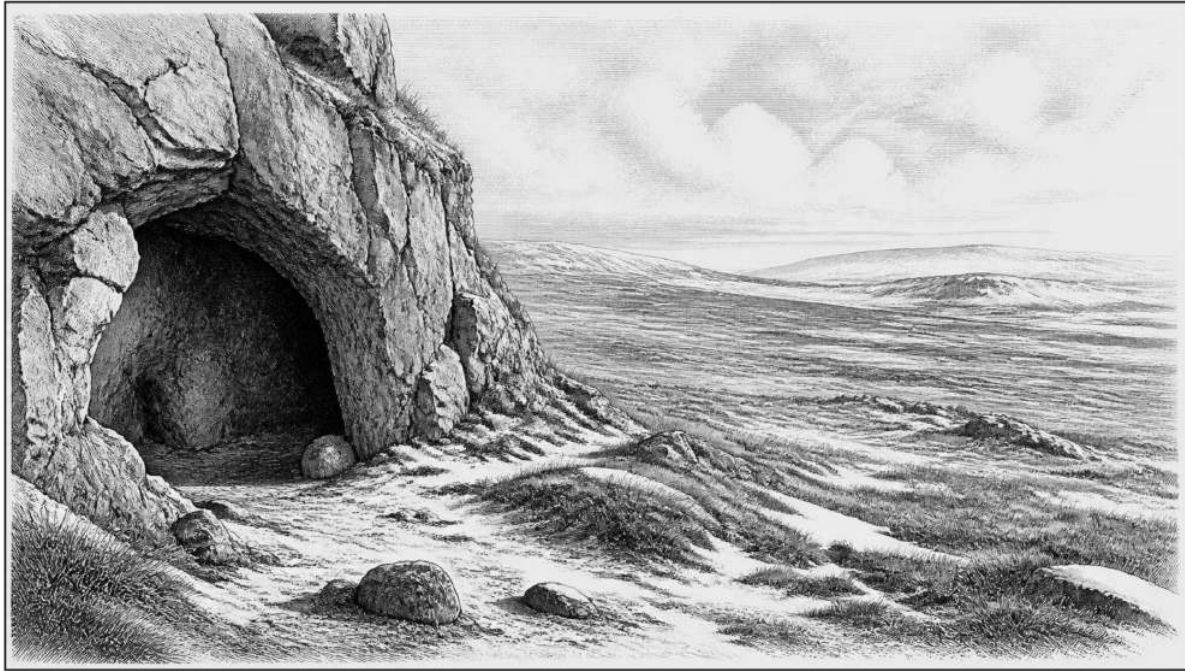
The period’s greatest historical force was environmental change. The expansion that later produced the Last Glacial Maximum would erase habitats, disrupt animal ranges and make long-term human occupation increasingly difficult or impossible over much of Ireland. After the ice retreated, plants, animals and eventually people recolonised a drastically altered landscape. The best-attested later Palaeolithic sign of people is the cut-marked brown-bear kneecap from Alice and Gwendoline Cave, County Clare; sustained evidence for communities is later still, in the Mesolithic after about 10,000 BP. These later discoveries should not be projected backwards to create continuity where none is demonstrated.

Yet the sparse evidence before the deep freeze changes the scale of Ireland’s past. It shows that the island was not simply an empty stage awaiting Holocene settlement. At intervals, it formed part of a wider north-west European ecological world in which mammoths, reindeer, giant deer, carnivores and perhaps very occasional human visitors reached its western edge. Castlepook’s bones are not a national origin story, nor proof of a lost Ice Age society. They are a fragile, scientifically revisable record of movement, survival and disappearance. Around 31,945 BCE, that is the most compelling history available: not a dated event, but a changing Ice Age landscape whose traces survived against considerable odds.

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31944 BCE

Mammoth Cave Assemblage^[57]



31,944 BCE is a modern calendar label, not a date at which archaeology can identify an Irish event. In the dating convention used by Quaternary researchers, it lies roughly 33,900 calibrated years before 1950, within Marine Isotope Stage 3 of the Late Pleistocene. Radiocarbon results for this remote period are expressed as probability ranges, and the surviving evidence is far too sparse to distinguish one calendar year from the next. What can responsibly be said is that Ireland stood on the threshold of a profound glacial transformation. Its environments were cold, changeable and regionally varied; its animal life is known chiefly from cave deposits; and whether people ever reached the island at this early point remains unproven.

A Landscape Approaching Glaciation

This was long before the Last Glacial Maximum, the cold peak conventionally placed about 26,000–19,000 calibrated years before present. Yet ice was expanding across the wider British–Irish region. Large-scale reconstructions suggest that, by about 31,000 years before present, ice was already growing in parts of Ireland and around its northern approaches, while the exact limits, thickness and timing varied from place to place. Projecting that reconstruction back almost 3,000 more years to 31,944 BCE requires caution. It would be misleading to picture the whole island beneath an unbroken ice sheet at this moment. Equally, it was no mild green island: severe winters, frost action, sparse plant cover and unstable climatic swings shaped much of the land.

Sea level was substantially lower than today because immense quantities of water were held in northern ice sheets. The coastline therefore lay farther out across areas that are now seabed. But lower sea level did not automatically create a simple, permanent dry road between Ireland and Britain or continental Europe. The changing configuration of sea, land and ice in the Irish Sea and North Channel remains a

specialised subject of geological reconstruction. Any movement of animals or people into Ireland may have involved exposed coastal plains, intermittent ice connections, short sea crossings, or combinations of these. The evidence does not permit a confident route map for 31,944 BCE.

What the Caves Preserve

The chief Irish archive for this period is Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. Formed in Carboniferous limestone above the Awbeg valley, it is a maze of narrow passages and chambers. Excavations conducted between the late nineteenth and early twentieth centuries recovered more than 2,000 animal bones. Modern reassessment makes Castlepook exceptionally important: it is Ireland's richest known assemblage for vertebrate life before the Last Glacial Maximum, and individual specimens have produced dates ranging broadly from about 45,700 to 19,950 radiocarbon years before present.

That impressive span is also a warning. Castlepook is not a sealed snapshot of one season, one generation or one year. Carnivores accumulated bones there; water disturbed parts of the deposits; antiquarian excavation methods did not record every layer to modern standards; and bones from widely separated episodes could become mixed. A list of animals from the cave cannot be converted into a claim that every species stood together outside its entrance in 31,944 BCE. Rather, the assemblage demonstrates that, across the middle and later phases of the last Ice Age, Ireland intermittently supported a remarkable cold-stage fauna.

The animals identified from Castlepook include woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox and spotted hyaena, alongside small mammals such as collared and Norwegian lemmings. These remains overturn an older popular image of Ice Age Ireland as simply empty. They indicate landscapes capable, at different times, of supporting grazing herds, scavengers and large predators. Reindeer and mammoth point towards open, low-productivity environments often described as steppe-tundra or tundra-steppe mosaics: grassland, herbs, sedges and patches of dwarf shrub rather than closed forest. Caves served as traps, dens, shelters and repositories within that ecosystem, not merely as scenic holes in the rock.

Recent radiocarbon work has complicated the story in a productive way. Improved pretreatment of bone samples has shown that some older dates from Irish caves were too young. Re-dating at Castlepook indicates a deeper Marine Isotope Stage 3 history for some fauna, and suggests that giant deer and spotted hyaena may have disappeared locally before about 40,000 calibrated years before present. This is important for the present date: these animals belong to the broader pre-glacial Irish record, but their presence specifically in 31,944 BCE cannot simply be assumed. The most secure conclusion is regional ecological change over millennia, not a fixed menagerie in a numbered year.

People: A Possibility, Not a Settlement

There is no securely dated house, hearth, stone-tool assemblage, burial, camp floor or human bone from Ireland that can be assigned to around 31,944 BCE. Nor is there evidence for a permanent population. The best-established published evidence for Palaeolithic human activity in Ireland remains much later: a brown-bear kneecap from Alice and Gwendoline Cave, County Clare, bearing cut marks made on fresh bone and dated to approximately 12,810–12,590 calibrated years before present. That evidence belongs around 10,800–10,500 BCE, more than 20,000 years after the date considered here.

Castlepook nevertheless keeps the earlier question open. Researchers have reported a reindeer bone from old collections with marks considered potentially consistent with stone-tool butchery and a date of roughly 33,000 years ago. If that interpretation is confirmed by further analysis and secure archaeological context, it could indicate a very early human presence in Ireland before the glacial maximum. It is not, however, a basis for declaring an established community in 31,944 BCE. Current investigations at Castlepook are seeking undisturbed sediments, further modified bones, lithics, charcoal and other evidence capable of testing this possibility. Until such material is securely recovered and dated, human activity at this depth of time remains an informed hypothesis rather than a demonstrated fact.

Society Beyond the Evidence

Consequently, there can be no responsible account of Irish political affairs, diplomacy, named leaders, territorial rule or organised warfare for this year. There are no texts, monuments or settlements from which to reconstruct them. If small human groups did visit the island, comparison with Upper Palaeolithic societies elsewhere in north-west Europe suggests highly mobile foraging parties, knowledge of seasonal animal movements, and skilled use of stone, hide, bone and fire. But this is comparative interpretation, not direct evidence from Ireland. The same distinction applies to trade: movement of people, animals or raw materials may have linked Ireland to neighbouring lands, but no imported tool or exchange network has been securely demonstrated for this date.

Religion, art and learning likewise leave no identified Irish trace from 31,944 BCE. Across Europe, Upper Palaeolithic people made images, ornaments and carefully worked objects, and caves could acquire symbolic significance. None of that permits us to assign cave art, ritual, language or funerary custom to Ice Age Ireland. Castlepook's name and the antiquarian labels of its chambers are modern, not prehistoric. Its true value is more austere but no less compelling: fossil bone, cave sediment, geological context and the possibility that overlooked museum collections may yet contain evidence of people.

The Making of a Future Island

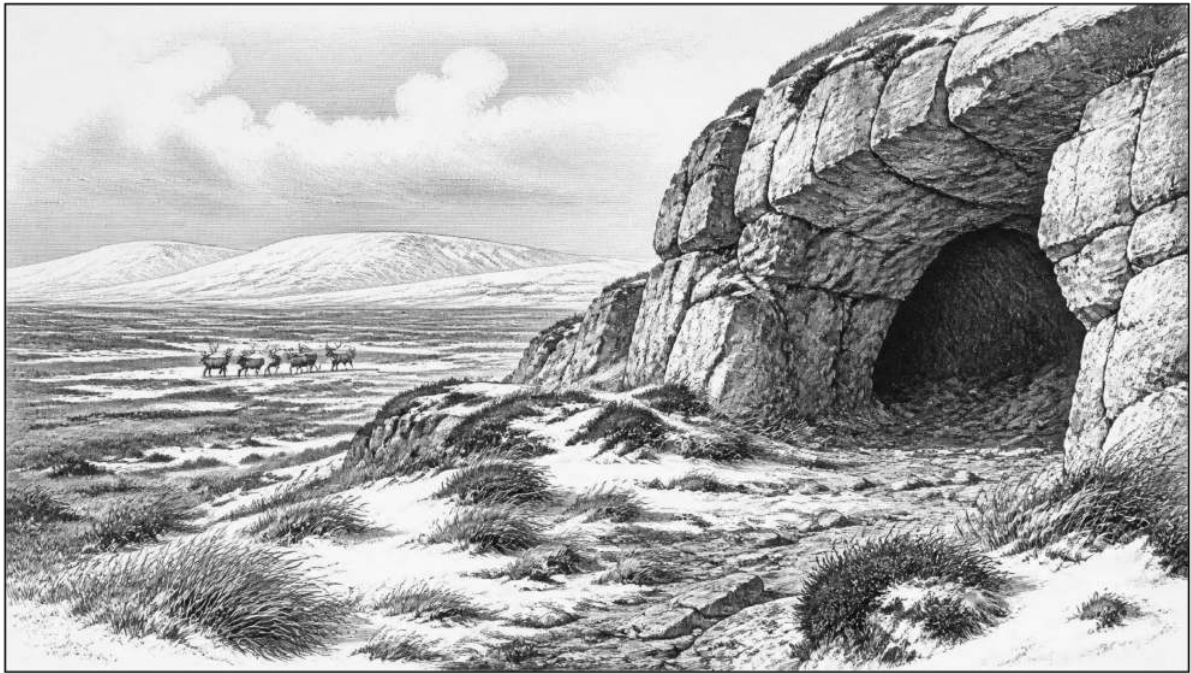
The most important development around this remote date was environmental rather than political. Ireland was entering the long cold phase that would alter its topography, drainage and habitable spaces. As ice expanded later, glaciers eroded bedrock, redistributed boulders and sediment, and helped create the landforms now mapped as drumlins, moraines, eskers, corries and glacial lineations. These processes also destroyed or buried many earlier surfaces on which people might once have camped. The shortage of open-air Palaeolithic sites may therefore reflect both genuinely limited human presence and the poor survival of evidence.

For Ireland in 31,944 BCE, the honest historical picture is therefore one of limits and possibilities. The island was part of a wider north-west European Ice Age world, with lowered seas, advancing ice and cold-adapted fauna. Castlepook Cave establishes that this was not an ecological blank, while its complicated deposits demonstrate why every claim must be qualified. No year-specific human drama can be recovered. Yet the bones beneath the limestone preserve a deeper truth: before the ice reshaped the country, Ireland was already a changing frontier of climate, animals and perhaps occasional human exploration.

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31943 BCE

IntCal Calibration Curve^[58]



“31,943 BCE” is a modern chronological label, not a date at which Irish prehistory can be observed year by year. No settlement, ruler, battle, treaty or ritual in Ireland can responsibly be assigned to that calendar year. At this depth of time, chronology comes from radiocarbon measurements, geological sequences and comparisons between deposits; all carry margins of uncertainty. A numbered BCE year should therefore be treated as a point within a much broader late-Pleistocene horizon, rather than as an anniversary.

The most useful frame is the later part of Marine Isotope Stage 3, before the fullest expansion of the last British–Irish Ice Sheet. Calibrated chronologies place the global Last Glacial Maximum at roughly 26,500–19,000 years before present, while the local maximum of the British–Irish Ice Sheet occurred at different times in different regions, broadly around 27,000–23,000 years ago. Around the notional date used here, Ireland was in a cold Ice Age world but was not simply the uniformly ice-buried island of later popular imagination.

Dating an Un-datable Year

The distinction between radiocarbon and calendar time matters especially here. ‘Before present’ in radiocarbon work conventionally uses AD 1950 as its reference point, and a radiocarbon age is not a calendar age. Atmospheric carbon levels have varied over millennia, so measurements must be calibrated against international curves such as IntCal20. Beyond about 25,000 calendar years ago, the resulting ranges are necessarily broad. The responsible language is therefore ‘c. 40,000–34,000 calibrated years before present’, or a similarly qualified range where the individual sample and method warrant it, not a claim that an event occurred in 31,943 BCE.

This caution is more than technical. Ireland's evidence is sparse, and much has been disturbed by erosion, cave processes and later glaciation. A fossil may date the death of an animal, not a human visit; a stone may have been moved by ice; and a cave deposit may represent many separate episodes. The archaeological record does not yield a continuous national narrative. It offers scattered, hard-won glimpses of changing habitats and occasional animal or human activity.

Castlepook and the Ice-Age Landscape

The key Irish locality for this broad period is Castlepook Cave, near Doneraile in north County Cork. The limestone cave system has produced more than 2,000 bones and is the richest known Irish site for vertebrate life leading up to the Last Glacial Maximum. Its dated remains span a long interval, approximately 45,700–19,950 radiocarbon years before present. That span is a warning against treating its entire animal list as a single moment, but it confirms that southern Ireland supported substantial large-mammal communities during parts of the middle and later Ice Age.

Woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena are represented at Castlepook, alongside later cold-adapted animals including Arctic fox, wolf, collared lemming and Norwegian lemming. Such remains point to an open, cold and variable environment rather than to the wooded Ireland familiar today. Grassland, herb-rich steppe-tundra, bare ground and seasonal snow would have offered forage to grazing and browsing animals. Limestone crags and caves provided sheltering places, dens, traps for bones and protected archives of sediments.

The cave's carnivore evidence is particularly revealing, though it must not be overstated. Spotted hyaenas were not exotic curiosities drifting through a temperate landscape: they were part of the Pleistocene fauna of southern Ireland. Their feeding and denning behaviour could accumulate, gnaw and scatter animal bones. Consequently, the presence of mammoth or deer remains in a cave does not automatically prove hunting by people. It may record natural death, carnivore transport or several processes acting over a long time.

People: A Possibility, Not a Population

A reindeer bone from Castlepook has been reported as bearing deep marks consistent with butchery by a stone tool and has been widely presented as evidence for human activity in Ireland about 33,000 radiocarbon years ago. If that interpretation is sustained, it would push evidence of human presence dramatically earlier than the better-known terminal Pleistocene traces. Yet it remains evidence for a brief activity at one cave, not proof of a settled population, a named culture, a route of arrival or a community lasting generations.

The need for restraint is underscored by the National Museum of Ireland's continuing statement that clear evidence for human presence in Ireland during the Palaeolithic has not yet emerged. That position reflects the difference between an important, debated indicator and an excavated settlement with securely associated tools, hearths, living surfaces and repeated occupation. Earlier claims for very ancient Irish artefacts have also failed scrutiny: the flint flake from Mell, County Louth, may have been made far away and later transported in glacial deposits.

Accordingly, the most defensible picture around this date is of possible episodic human visitation to an accessible part of Ireland, perhaps by highly mobile Upper Palaeolithic hunter-gatherers, rather than an established Irish society. Any visitors would have belonged to wider north-west European networks, but

their language, kinship, beliefs, clothing and precise technologies are unknown in Ireland. Comparison with contemporary groups in Britain and continental Europe can suggest possibilities, such as expert knowledge of seasonal animal movements and stone-working, but cannot fill Irish gaps with certainty.

No Politics, but Real Movement

There is no evidence for political institutions, territories, diplomacy or organised warfare in Ireland at this time. Such terms require social traces that simply have not survived. Nor should the island be imagined as an empty stage awaiting later history. Animal populations were moving through changing habitats; predators and prey shaped one another's ranges; and perhaps small human groups occasionally crossed a very different coastal geography. These were forms of movement and competition, but not demonstrable 'affairs of state'.

Sea level was much lower globally because vast volumes of water were stored in ice sheets, exposing broad areas of today's continental shelf. Ireland's coastlines were therefore unlike modern ones, while the Irish Sea basin and surrounding ice margins changed repeatedly. Low sea level did not automatically create a simple, permanent dry land bridge from Ireland to Britain. Ice, water, shifting shorelines and harsh terrain all affected access. The route by which animals—and any people—reached Ireland remains a problem for palaeogeography, not a settled fact.

Ice Was Advancing

The central regional development was climatic deterioration and the growth of ice. Geological evidence from western Ireland records substantial loading by an Irish ice sheet during the long interval from about 40,000 to 19,000 calibrated years ago, including a major advance towards the continental shelf around 28,000 calibrated years ago. Later research shows that ice extent varied by sector: western and southern margins did not necessarily reach their greatest positions at the same time, and mountain summits could preserve cold-based ice or older frost-weathered surfaces.

This changing ice regime helps explain the fragmentary archaeological picture. Advancing glaciers eroded older land surfaces, rearranged sediment and deposited till; meltwater and later weathering further modified the record. Caves such as Castlepook are precious precisely because they could retain bones and sediments that open landscapes often lost. What survives is therefore biased towards protected locations and robust materials. Absence of a campsite cannot demonstrate that nobody ever visited; equally, absence of a full settlement record means that permanent occupation cannot be claimed.

Everyday Life Beyond Reach

For the same reason, everyday life can only be described conditionally. If people entered Ireland during this broad period, they would have needed portable shelter, fire, warm clothing and dependable knowledge of animals and terrain. Reindeer could have supplied meat, hides, sinew, bone and antler; stone tools would have been essential for butchery and working organic materials. These are reasonable inferences from Upper Palaeolithic lifeways elsewhere, not direct evidence for a camp at Castlepook or elsewhere in Ireland.

There is no securely Irish evidence for houses, storage pits, art, graves, shrines, long-distance exchange, boats or formal learning at this date. There can therefore be no responsible account of Irish religious practice, trade or social hierarchy. The later Mesolithic sites at Mount Sandel and Hermitage,

and the still later farming landscapes and tombs, belong to entirely different climatic and chronological worlds. They demonstrate that Ireland was eventually peopled in durable ways; they do not supply missing detail for the Ice Age.

The Historical Significance

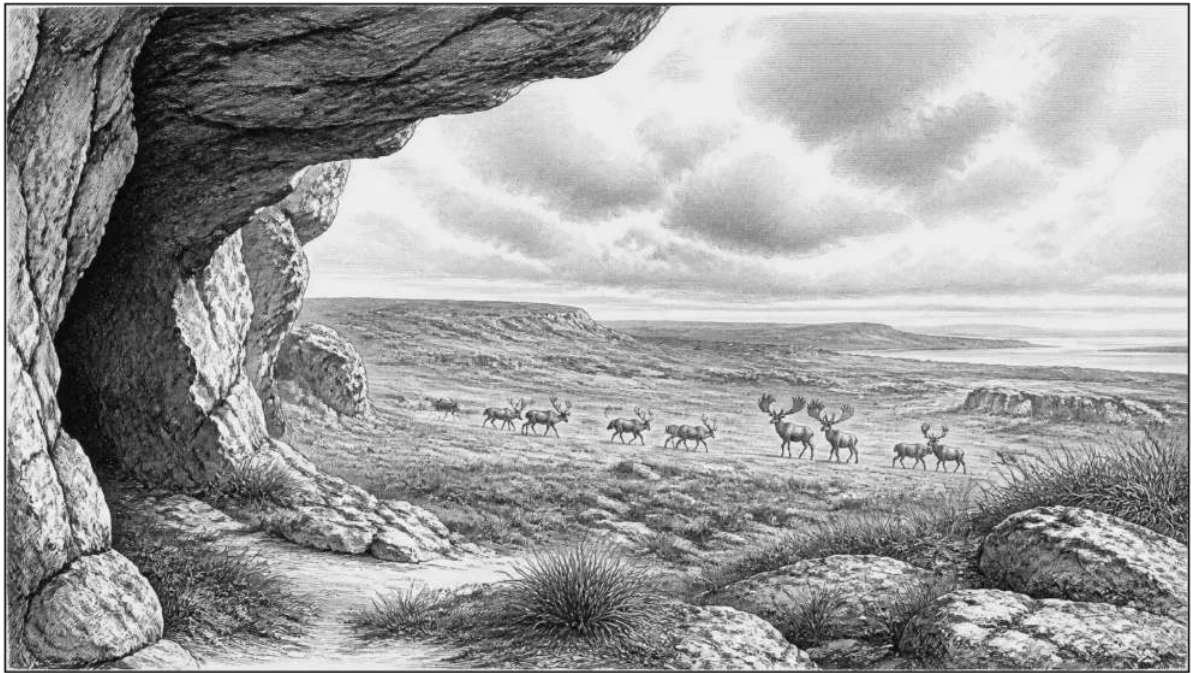
The significance of this period lies not in a conventional event but in the limits and promise of evidence. Around the modern label 31,943 BCE, Ireland was part of a dynamic Pleistocene north-west Europe: a cold land with large mammals, carnivores, altered coastlines and advancing ice. Castlepook Cave shows that the island's pre-Last-Glacial-Maximum fauna was richer than older accounts allowed. The reported cut-marked reindeer bone raises the prospect of an unexpectedly early human visit, but it does not yet transform that prospect into a narrative of settlement.

Future work may refine the dates, identify further marks, recover ancient environmental DNA, or uncover a secure tool assemblage and occupation surface. Until then, the honest Year by Year entry is one of calibrated ranges, cave deposits and careful uncertainty. Ireland's story at this point is not a tale of kings or monuments. It is the deeper history of a changing Ice Age landscape, and of the rare traces that escaped the ice.

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31942 BCE

Castlepook Cave Mammals^[59]



The label 31,942 BCE is a modern chronological convenience, not a date that can be matched to a recorded Irish event. There were no calendars, written names or year-by-year histories in Ireland at this depth of time. In archaeological terms, it is best treated as an approximate point around 33,900 calendar years before AD 1950, within the Late Pleistocene and broadly within Marine Isotope Stage 3. Radiocarbon ages must be calibrated and are normally expressed as ranges, not as single historical years. The evidence can therefore illuminate conditions in Ireland around this era, but cannot tell us what happened on one particular day, season or year.

This was long before the Last Glacial Maximum, when the British–Irish Ice Sheet reached its greatest known extent, broadly after about 27,000 years ago. Yet it was already an Ice Age world: cold, unstable and undergoing major environmental change. Ireland was not the familiar green, wooded island of later prehistory. Its coasts, ice margins, vegetation and animal populations altered over millennia, while subsequent glaciers repeatedly eroded and buried earlier landscapes. That destructive history is one reason why the archaeological record for this period is so exceptionally slight.

An Uncertain Irish Landscape

At about 33,900 years ago, Ireland lay on the north-western edge of Europe, exposed to strong climatic shifts in the North Atlantic region. It should not simply be imagined as an island uniformly sealed beneath ice. Reconstructions of the British–Irish Ice Sheet show growth was spatially complex, with local ice centres, changing marine margins and advances that did not occur everywhere at once. The great expansion that carried ice far across the continental shelf lay ahead. Around this earlier point, some

districts may have been ice-covered or affected by glacier ice, while others could have supported cold-adapted plants and animals. Precision beyond that is not responsible: current evidence cannot provide a detailed island-wide map for 31,942 BCE.

The likely visible world in ice-free areas was open rather than forested: grass, herbs, sedges and sparse low vegetation, with exposed rock, gravel, frozen or seasonally waterlogged ground and patches of snow. Such a mosaic is inferred principally from the animals represented in Irish cave deposits and from wider north-west European palaeoenvironmental evidence. It is an interpretation, not a direct snapshot. Trees may have survived locally during milder intervals, but there is no basis for picturing extensive woodland, settled clearings or a stable agricultural landscape. Farming, domestic livestock and cultivated plants were still tens of thousands of years in the future.

What the Caves Preserve

The most important Irish evidence for this broad period comes not from villages or tools, but from animal bones. Limestone caves in the south and south-east have preserved fragments of a Late Pleistocene fauna otherwise vulnerable to erosion. Castlepook Cave, near Doneraile in north County Cork, is especially significant. Its historical excavations recovered remains attributed to animals including woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, fox, hare, collared lemming, Norwegian lemming and spotted hyaena. The presence of cold-adapted lemmings and reindeer, alongside large grazers and predators, supports an image of open, severe environments capable of sustaining a varied food web.

That list needs care. A cave deposit is not a census of animals standing together in one valley at one moment. Bones can enter caves through carnivore activity, natural death, water movement, collapsing sediments and human excavation. Castlepook was explored in the early twentieth century, before modern standards of stratigraphic recovery and dating. Later re-dating has shown that some older radiocarbon determinations from southern Irish caves were unreliable and that several animal remains were substantially older than previously supposed. The site remains invaluable, but it is a time-layered archive rather than a neatly sealed scene from a single occupation.

Nevertheless, the faunal record establishes an important point. Ireland was not an ecological blank before the major ice advance. Between at least about 45,000 and 20,000 years ago, a richer suite of mammals reached the island than survived into later periods. Giant deer, often misleadingly called the “Irish elk”, were large grazing browsers rather than ancestors of modern Irish deer. Stable-isotope and tooth studies from the wider north-west European record indicate that giant deer relied heavily on grasses and herbs, supplemented by browse. Mammoths and reindeer likewise indicate substantial open feeding grounds. Spotted hyaenas, wolves and bears remind us that these animals formed a living predator-and-scavenger community, not merely a parade of impressive fossils.

People: Possibility and Proof

Human presence around 31,942 BCE remains unproven by securely published archaeological evidence. There is no excavated dwelling, hearth, stone-tool assemblage, human burial, cave art panel or securely associated butchered-animal deposit in Ireland that can responsibly be assigned to this precise era. A reported cut-marked reindeer bone from Castlepook, publicised as evidence of human activity

about 33,000 years ago, is potentially important. But a promising observation on a bone is not, by itself, proof of a settled population. Its wider context, the date of the animal, the origin and timing of the marks, and the absence or presence of associated artefacts all require rigorous publication and continued testing.

The distinction matters because the strongest published evidence for Pleistocene human activity in Ireland is much later. At Alice and Gwendoline Cave in County Clare, a brown-bear kneecap bears cut marks made while the bone was fresh. Radiocarbon dating places it at the beginning of the Younger Dryas, approximately 12,890–12,678 calibrated years before present. That is compelling evidence of people processing an animal carcass in Ireland late in the Ice Age; it is not evidence that people were present continuously from 34,000 years ago. The gap between the two periods is vast, and glacial conditions intervened.

It follows that the people of Ireland cannot be described for this year, because their presence cannot yet be demonstrated. Upper Palaeolithic communities elsewhere in Europe certainly made sophisticated stone, bone and antler tools, hunted large animals, travelled across wide territories and created remarkable visual culture. Those comparisons help archaeologists frame questions about possible visitors to Ireland, but they cannot fill Ireland's evidential silence. It would be unjustified to assign a named culture, language, identity, artistic tradition or migration route to an Irish population at this date.

No Politics, No Recorded Conflict

There is no evidence for political authority, diplomacy, territorial states, chiefs or organised warfare in Ireland around 31,942 BCE. Nor is there evidence for permanent settlements, houses, cemeteries, food stores or long-distance trade networks on the island. If people did occasionally reach Ireland in this period, the scale most consistent with the wider Upper Palaeolithic world would be small, mobile groups exploiting seasonal opportunities rather than towns or kingdoms. That is a reasoned possibility, not an Irish fact established by excavation.

The same restraint applies to everyday life and belief. Animal remains prove that animals lived or died in Ireland; cut marks, where securely identified and dated, can prove carcass processing. They do not reveal family arrangements, clothing, stories, ceremonies or religious ideas. Caves can acquire later ritual meanings, but no such meaning can be projected back automatically onto an Ice Age cave deposit. There is equally no evidence for Irish mining, metallurgy, farming, maritime commerce or formal exchange at this time. Any social knowledge held by potential hunter-gatherers would have been transmitted orally and practically, but its content is irrecoverable here.

Routes, Barriers and Change

How large mammals reached Ireland remains one of the central questions posed by the Pleistocene record. Lower sea levels changed the geography of the Irish Sea basin, and shifting ice could create barriers as well as potential corridors. Yet lowered sea level should not be turned automatically into a simple, permanent land bridge from Britain or the continent. The sea floor has been altered by glaciation and rising post-glacial seas, while ice, water and land connections varied through time. Different species may have arrived by different means, and human movement, if it occurred, would have faced its own practical constraints.

Regional variation is clearest in the surviving evidence. County Cork's Castlepook Cave is a major archive for older Late Pleistocene fauna; caves in Waterford and Clare add further fragments; much of the rest of the island has yielded little that can be securely dated to this period. This unevenness does not

prove that animals, or possible people, were absent elsewhere. It reflects where caves existed, where sediments survived, where fossil recovery occurred and where modern dating programmes have been undertaken. Glacial erosion and antiquarian collecting have both shaped what can now be known.

A Precarious Deep Past

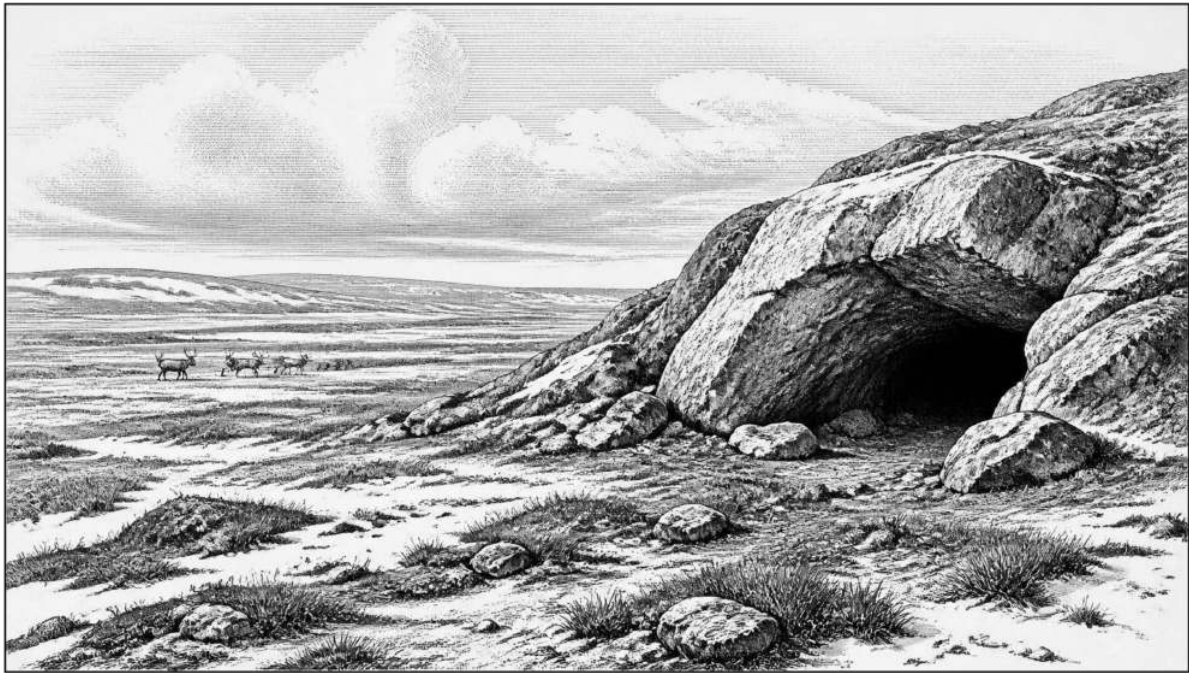
The chief development relevant to Ireland around 31,942 BCE was environmental, not political: the island stood within a cold Late Pleistocene world on the approach to more extensive glaciation. Its caves preserve evidence of a lost fauna whose members included mammoth, reindeer, giant deer and formidable carnivores. They show that Ireland had ecological links with the wider north-west European world, while leaving the exact routes and timings of colonisation unresolved.

For human history, the honest conclusion is necessarily modest. There is no secure basis for an Irish society, event or individual in this numbered year. There may be an important lead in the reported Castlepook reindeer bone, but its implications remain to be tested against the demanding standards of context, dating and publication. The enduring value of this period lies precisely in that uncertainty: museum collections, cave sediments, radiocarbon calibration and renewed excavation can still transform what is known about Ireland before the great ice advance.

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31941 BCE

Spotted Hyaena at Castlepook^[60]



A Modern Year in Deep Time

“31,941 BCE” is a modern chronological label, not a year that can be isolated in the Irish archaeological record. There were no calendars, written documents, named individuals or dated political events in Ireland at this depth of time. The label corresponds only approximately to 33,900 years before present (where “present” conventionally means AD 1950), within the Late Pleistocene and Marine Isotope Stage 3, a climatically volatile phase of the last Ice Age. Responsible dating is therefore expressed as radiocarbon determinations and calibrated ranges, not as an assertion that a particular event occurred in this numbered year.

For Ireland, this is a particularly difficult but important interval. Later glaciation, erosion, changing sea levels and early cave excavations have erased or disturbed much of the evidence that might once have survived. The country’s evidence is not a sequence of settlements, but a scattered combination of animal remains, cave deposits, glacial landforms and environmental sediments. These sources can illuminate the conditions in which people might have travelled through Ireland; they cannot supply a conventional national history.

Ireland Before the Last Glacial Maximum

At roughly 34,000 calibrated years before present, Ireland had not yet reached the fullest extent of the last British–Irish Ice Sheet. This does not mean that the island was mild, wooded or stable. The climate fluctuated sharply between colder and relatively less severe phases, while snowfields and local ice masses may have occupied high ground. Yet geological evidence indicates that north-central Ireland remained

ice-free until at least about 34 ka, before the principal build-up and expansion of the last Irish Ice Sheet. The great expansion that transformed the landscape came later: major ice-sheet growth occurred after about 31 ka, with maximum volume around 23 ka and extensive ice occupying Irish land and surrounding shelves during the global Last Glacial Maximum, conventionally c. 26.5–19 ka.

This distinction matters. Ireland around the notional date was not simply an uninterrupted white ice cap. Some areas could support terrestrial animals, particularly in southern and central lowlands and in intermittently open landscapes. But it would be equally misleading to picture the familiar green island. Conditions were cold, exposed and strongly seasonal. The vegetation was probably dominated locally by treeless tundra-steppe communities: grasses, sedges, herbs, mosses and low shrubs able to withstand wind, frost and short growing seasons. The exact pattern varied with altitude, latitude, soils and the advance or retreat of ice.

Coastlines were also unlike those of modern Ireland. Global sea level was substantially lower during the wider glacial period because vast volumes of water were stored in continental ice sheets. Exposed shelves altered the geography of the Irish Sea and Atlantic margins, but neither the exact extent of dry land nor a practical route into Ireland can be reconstructed for 31,941 BCE with confidence. Later modelling demonstrates that connections between Ireland and Britain were temporary and complicated by ice, sea level and crustal movement. It is safer to say that Ireland was part of a changing north-west European landscape, rather than to imagine an easy, permanent land bridge.

Castlepook Cave and an Animal World

The leading Irish evidence relevant to this period comes from Castlepook Cave near Doneraile in north County Cork. Excavated principally between 1904 and 1914, the cave produced a remarkably rich collection of Pleistocene animal bones. Its deposits and collections are difficult to interpret because material was removed long before modern excavation standards, much was lost, and carnivores, water and later disturbance had mixed some remains. Castlepook is therefore an archive of repeated episodes over a long span, not a snapshot of one year or one living community.

Even so, improved radiocarbon work has shown that the cave preserves significant Marine Isotope Stage 3 fauna. The wider assemblage includes remains of reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena. Not all these animals were necessarily present at precisely the same time, and their bones do not automatically indicate an open-air hunting ground nearby. Hyaenas and other carnivores could carry and chew carcass parts in caves; natural death, scavenging, sediment movement and excavation history each shaped the collection.

Nevertheless, the fauna provides firm environmental evidence. Reindeer and lemmings point towards cold-adapted habitats, while mammoth and giant deer indicate that large herbivores could reach or persist in parts of Ireland during the long pre-maximum interval. Predators followed such prey. A cave bearing hyaena remains is especially revealing: spotted hyaena is otherwise extremely rare in Ireland's Pleistocene record. The animals show that Ireland was connected ecologically to the broader fauna of north-west Europe, even if the routes, durations and seasons of their movements remain uncertain.

A Possible Human Trace

Castlepook has also become central to a much more cautious question: were people present? A reindeer femur from the cave collection has been reported as about 33,000 years old and as bearing a mark interpreted as having been made during butchery with a sharp stone tool. If the mark is confirmed as anthropogenic and contemporary with the animal's death, it would be a striking indication that Upper Palaeolithic people reached Ireland far earlier than the long-accepted post-glacial settlement horizon.

That possibility must not be converted into certainty. The bone derives from an old and disturbed collection rather than a newly excavated, sealed occupation floor. No securely associated hearth, stone-tool assemblage, dwelling, human bone, burial or art has established a community at Castlepook in the thirty-second millennium BCE. A radiocarbon date tells us the age of the animal bone; deciding whether an incision was made by a human tool rather than another process is a separate taphonomic judgement. Recent work at the cave has sought surviving deposits precisely because the question needs testing through controlled excavation and better contextual evidence.

The evidence therefore supports a limited conclusion. Around the broad period represented by 31,941 BCE, people may have made short visits to Ireland and processed large game there. It does not establish permanent colonisation, a continuous population, or descent from those possible visitors to later inhabitants. Nor can those hypothetical visitors responsibly be given an Irish ethnic identity, a language or a named archaeological culture. Upper Palaeolithic groups elsewhere in Europe made sophisticated stone tools, clothing and artworks, but those wider comparisons are context, not proof that identical practices occurred in Ireland.

Everyday Life Without a Settlement

If humans did reach southern Ireland in this period, their lives would have been mobile and highly practical. A small hunting party moving through a cold, open environment would have required intimate knowledge of animal movement, weather, shelter, fuel and workable stone. A butchered reindeer limb could imply the recovery of meat, marrow, hide, sinew or bone rather than a single purpose. Yet this remains interpretation, not direct Irish evidence of a camp. No excavated site of this age in Ireland currently reveals huts, hearths, storage areas, tool-making floors or a seasonal round.

There is likewise no evidence for farming, livestock, fields, pottery, metalworking or regular trade. Food production lay many millennia in the future. The possible economy was one of foraging, hunting and opportunistic use of animal resources, but even that phrasing should be understood as an inference from the ecological setting and from Upper Palaeolithic parallels, not a documented Irish economy. Caves may have been visited by people, animals or neither at different times; they were not necessarily homes.

No Politics, Monuments or Recorded Belief

Political affairs, diplomacy and warfare cannot be described for Ireland in 31,941 BCE because there is no evidence for states, kingdoms, chiefs, territorial boundaries or organised conflict. Nor is there Irish evidence from this period for shrines, formal burial grounds, ritual monuments, cave art or religious ceremonies. The spectacular tombs, rock art and ceremonial landscapes often associated with prehistoric Ireland belong to vastly later Neolithic and Bronze Age societies. Projecting them backwards by tens of thousands of years would obscure rather than enrich the past.

The same restraint applies to culture and learning. People in Upper Palaeolithic Europe undoubtedly possessed complex knowledge, social traditions and ways of communicating, but Ireland has not yielded securely dated material from this period that can reveal them. There are no personal names, oral texts or visual symbols to recover. The silence of the record is not proof that people had no culture; it is a measure of what survives and what archaeologists can presently demonstrate.

Landscape as Historical Evidence

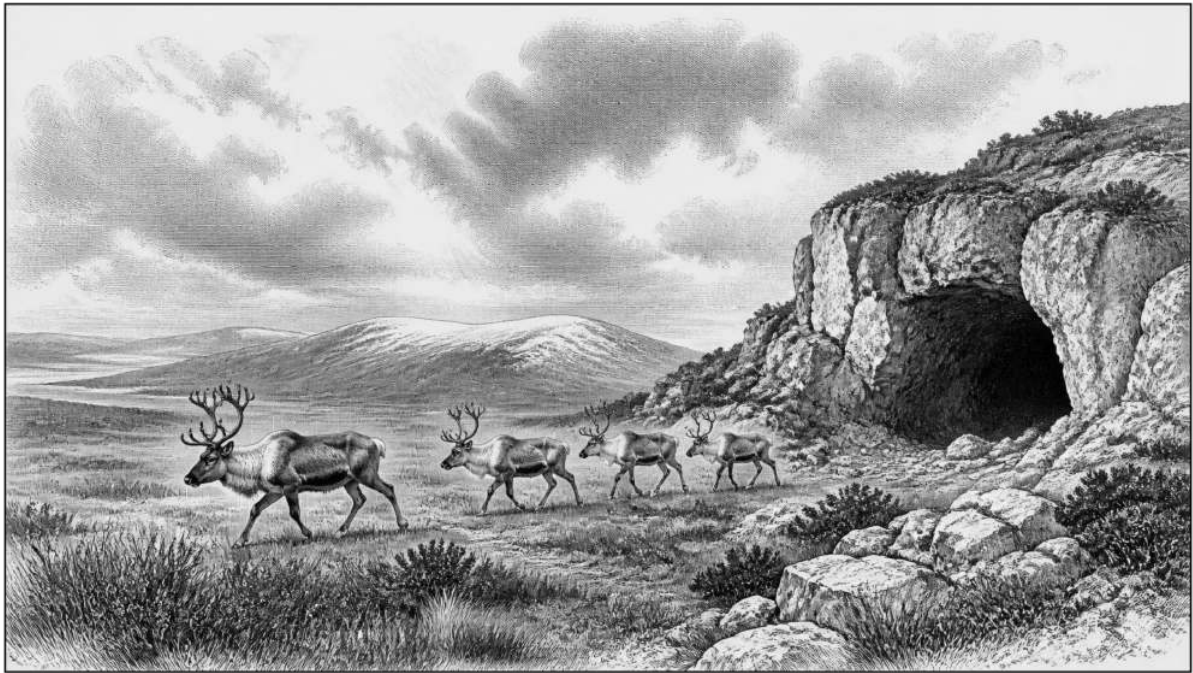
The principal historical development around this notional year was environmental rather than political: Ireland stood near the threshold of profound glaciation. Over the following millennia, advancing ice would reshape valleys and coasts, transport sediments, scour bedrock and destroy or bury many older surfaces. Drumlins, moraines, meltwater channels and erratic boulders visible in Ireland today are, in part, the long aftermath of that process. Their study explains why evidence for early people is so slight and why a single cut-marked bone can matter so much.

31,941 BCE should therefore be remembered not as a dated Irish event but as a window onto an uncertain Ice Age landscape. Castlepook Cave demonstrates that cold-adapted animals occupied Ireland in the broader period; its reported modified reindeer bone raises the possibility of a fleeting human presence. Beyond that, certainty ends. The most honest history of this time is one built from calibrated ranges, animal remains, ice-sheet reconstructions and the disciplined distinction between evidence and imagination.

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31940 BCE

Courtmacsherry Coastal Deposits ^[61]



“31,940 BCE” is a modern label, not a year that can be recovered from Ireland’s Ice Age record. No Irish calendar, written source, settlement sequence or historical event can be fixed to it. In archaeological terms, it serves only as a point within a much wider span: approximately 34,000 years ago, during the Late Pleistocene and Marine Isotope Stage 3, before the fullest expansion of the last British–Irish Ice Sheet. Dates for this deep past are normally expressed as radiocarbon years or calibrated ranges, each with uncertainties. The responsible history of Ireland at this point is therefore not a story of a named people or a dated occurrence, but of changing climate, animals, landscapes and a tantalising—still unconfirmed—possibility of brief human visits.

A Point Within a Long Cold Age

The date falls before the global Last Glacial Maximum, conventionally dated to about 26.5–19 thousand calibrated years before present, and before the local maximum of the British–Irish Ice Sheet, generally placed around 27,000 years ago. That distinction matters. Ice-sheet growth was not a single instant, nor did all parts of Ireland and the surrounding seas experience the same conditions at once. The island was moving into the severe later stages of the last Ice Age, but the evidence does not justify imagining it as a uniform, permanently frozen white expanse in 31,940 BCE.

Marine Isotope Stage 3 was climatically unstable. Cold phases alternated with relatively milder intervals, and the scale, thickness and direction of ice changed over millennia. Later ice advances greatly reworked the land, scouring away soils and deposits and burying older evidence beneath till, gravel and outwash. Consequently, the surviving record is uneven: caves in the limestone districts of the south and

west have preserved bones and sediments far better than most open-air landscapes. Absence of an archaeological site is not, by itself, proof that nobody ever entered Ireland; yet it does mean that claims of occupation must remain restrained.

Southern Ireland and the Ice

At the requested notional date, Ireland was not the island familiar today. Global sea level was lower than at present because much water was locked in continental ice sheets. Broad shelves now beneath the Atlantic, Irish Sea and Celtic Sea formed a larger exposed or shallow-water world, although the exact coastlines and crossings changed as sea level, ice and the Earth's crust responded to glaciation. Ireland's physical connection with Britain and continental Europe at particular moments remains a matter for detailed reconstruction, not a licence to assume an easy land bridge from every shore.

The south of the island is especially important. Research on coastal sediments at Courtmacsherry and elsewhere shows that some southern Irish deposits formed during Marine Isotope Stages 4–3, before the later ice advance laid down tills over them. This demonstrates that landscapes and shorelines existed there before the Last Glacial Maximum, even though later ice covered much of southern Ireland. It also overturns older, simpler maps that treated major moraine belts as the fixed outer limit of the final Irish ice sheet.

We should nevertheless avoid projecting the well-dated maximum backwards without qualification. The strongest evidence for ice reaching the Atlantic shelf edge west and north-west of Ireland belongs to the later maximum and its retreat, especially after about 27,000 calibrated years before present. Moraines, subglacial tills, streamlined landforms and offshore sediment cores record powerful, mobile ice. They reveal the processes that made much of modern Ireland's physical framework—drumlins, glacial troughs, eskers, spreads of gravel and thick deposits of till—but they do not provide a photograph of one particular year in the thirty-second millennium BCE.

A Faunal Ireland

The clearest direct evidence for Irish conditions around this broader period comes from animal remains. Cave deposits in southern Ireland contain an Ice Age fauna that differs sharply from the later, post-glacial island fauna. Castlepook Cave, near Doneraile in north County Cork, is particularly significant because it has yielded extensive Pleistocene bone assemblages. Its record includes reindeer and other cold-stage animals, while the cave evidence as a whole demonstrates that at least parts of Ireland could support sizeable mammals during intervals before the final ice maximum.

Radiocarbon reassessment has made this evidence more valuable but also more complicated. Improvements in bone pretreatment can alter very old radiocarbon results, and calibrated ages near the practical limits of radiocarbon calibration require special care. Studies of Irish deer remains identify pre-Last Glacial Maximum dates in the broad range relevant here, including southern cave specimens dated to approximately 32,930–31,280 calibrated years before present and 30,297–29,594 calibrated years before present. These dates establish the presence of large deer in southern Ireland before the maximum; they do not prove that every species was contemporaneous, widespread or continuously resident.

Reindeer are a useful environmental indicator, though not a complete climate thermometer. Their presence accords with open, cold landscapes where grass, sedges, herbs and low shrubs could support grazing herds. Such terrain was unlike the dense oak-and-hazel woods of much later prehistoric Ireland.

Caves may have served as natural traps, den sites, occasional shelters or places where water and sediment accumulated carcass remains. A bone found in a cave is therefore evidence for an animal's presence, not automatically for a human hunt, a habitation floor or a seasonal camp.

The Castlepook Question

Castlepook also lies at the centre of a potentially important claim. A reindeer bone from the older collection has been reported as bearing a mark consistent with butchery by a sharp stone tool and as dating to roughly 33,000 years ago. If confirmed through full publication, contextual study and comparison with natural damage, it would be the earliest known indication of human activity in Ireland, and it would lie close in time to the modern label used for this article. It would suggest a very brief Upper Palaeolithic visit, perhaps by people moving through the wider north-west European world, rather than a settled Irish population.

But this must remain interpretation, not established narrative. The reported Castlepook evidence has prompted renewed excavation precisely because the earlier digs recovered rich fauna but did not establish a secure human occupation. The 2022 investigation aimed to determine whether intact Pleistocene deposits survived and whether new evidence—such as lithics, charcoal, further modified bone or cave art—could be recovered. Until a securely dated assemblage is published, it is not responsible to describe people living at Castlepook in 31,940 BCE, still less to assign them houses, language, kin groups or territory.

The contrast with later evidence is instructive. The butchered brown-bear kneecap from Alice and Gwendoline Cave in County Clare has independent calibrated radiocarbon determinations of about 12,810–12,590 calibrated years before present and offers evidence for a much later Upper Palaeolithic human presence. The first substantial and securely attested settlement record, however, belongs to the Mesolithic, from roughly 8000–7000 BCE onward. The National Museum of Ireland therefore continues to state that clear proof of human presence during the Palaeolithic has not yet emerged.

Society, Economy and Culture: What Cannot Be Claimed

There is no evidence for political affairs, diplomacy, warfare, chiefs, tribes or territorial boundaries in Ireland at this date. There are no settlements, burials, tools securely associated with occupation, monuments, artworks or inscriptions that can reveal social organisation. Likewise, no evidence supports statements about Irish religion, ritual, learning, trade networks, farming, seafaring or exchange in 31,940 BCE. These are not gaps to be filled with picturesque speculation. The terms “Ireland”, “Irish society” and even “community” must be used cautiously here: they designate a geographical frame, not a demonstrable population.

If the Castlepook cut mark eventually proves anthropogenic, the most that could be said is that one or more Upper Palaeolithic visitors processed an animal. Butchery would imply practical knowledge of cutting implements, carcass use and survival in a demanding northern environment. It would not demonstrate permanent occupation. A temporary hunting or exploratory party could leave only a few modified bones, while later glaciation and erosion might remove almost everything else. Conversely, natural striations, carnivore activity, excavation damage and disturbed cave deposits can all imitate or obscure human traces. The distinction is made by microscopic analysis, taphonomy, dating and context—not by the attractiveness of a story.

Landscapes Still in the Making

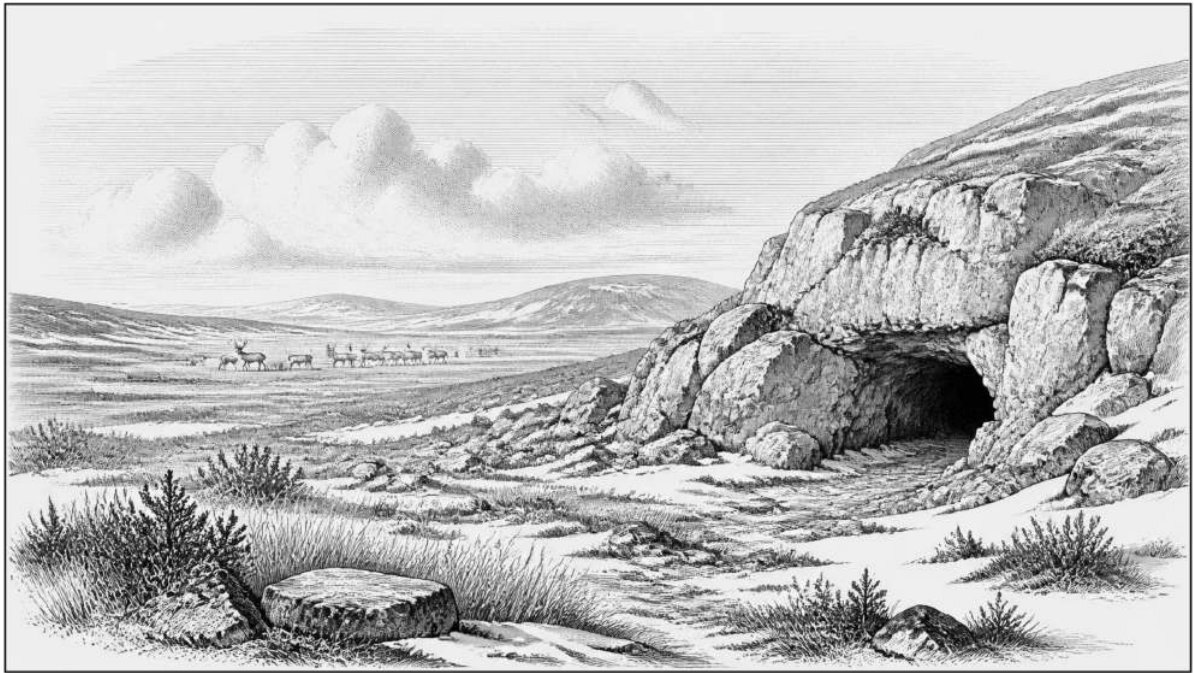
What can be said with confidence is that Ireland's future terrain was being shaped on a colossal scale. The expanding British–Irish Ice Sheet redirected ice flow, transported rock, eroded valleys and bedrock, and deposited sediment across land and continental shelf. Later stages produced the drumlin fields of the north and midlands, glacially deepened basins and moraine systems visible on land and beneath the sea. Modern high-resolution seabed surveys continue to reveal iceberg scours, meltwater channels, moraines and other traces of these processes, showing how much of the relevant evidence now lies offshore.

For Ireland in the vicinity of 31,940 BCE, then, the principal development was environmental rather than political: the approach of the great ice expansion that would transform the island and severely limit the preservation of earlier landscapes. Southern caves preserve a rare glimpse of pre-maximum animal life and perhaps of a human encounter with it. The evidence is powerful precisely because it is so slight. It tells us not of an established Ice Age nation, but of a marginal, changing land whose earliest human traces, if real, were fleeting footprints before the deep freeze.

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31939 BCE

Uneven Ice-Sheet Advance^[62]



31,939 BCE is not a year that can be recovered from the Irish archaeological record as a dated event. It is a modern, proleptic calendar label applied to a time before writing, named polities or calendars in Ireland. Archaeologists instead work with radiocarbon determinations, calibrated ranges and geological sequences. In those terms, this notional year falls broadly around 34,000 years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3: an unstable interval of the last Ice Age, preceding the fullest expansion of the last Irish Ice Sheet. The appropriate history is therefore not a list of happenings in one year, but a carefully bounded reconstruction of what the evidence can, and cannot, say about Ireland in the early thirties of millennia BCE.

A Landscape Before Maximum Glaciation

At this point Ireland was not yet necessarily the wholly ice-covered land familiar from reconstructions of the Last Glacial Maximum. Syntheses of glacial evidence suggest that much of Ireland remained largely ice-free until roughly 32,000 years ago, after which the last Irish Ice Sheet expanded and thickened. Its advance was not instantaneous or uniform. Different sectors of the ice sheet reached their maximum offshore limits at different times, with the western and southern shelves occupied later than some northern areas. A date around 31,939 BCE therefore belongs close to a major environmental transition rather than securely within one simple, island-wide condition.

This qualification matters. It would be misleading to picture all of Ireland as either a green, habitable island or a single unbroken glacier. Climate fluctuated sharply during Marine Isotope Stage 3, and the extent of ice, snow cover, permafrost, open ground and vegetation varied through time and from region to

region. The evidence comes chiefly from landforms, sediment layers, cave deposits, fossil bones and scientific dating, not from contemporary descriptions. It can show broad processes and approximate sequences, but rarely reconstruct a particular valley, season or year with confidence.

Even where land was exposed, it would have been a severe world. Lower global sea levels altered coastlines and exposed parts of the continental shelf, although ice, changing sea level and the Irish Sea still made any route between Ireland and Britain contingent and difficult. Modern coastlines should not be projected backwards. Much of the land that would later become shore lay differently in relation to sea and ice, while places now inland could have experienced a colder, more continental climate than modern Ireland. The glaciation that followed would also erode, bury or disperse many older surfaces, severely limiting the survival of open-air evidence.

Animals in Southern Irish Caves

The strongest direct evidence for Ireland around this broad period is environmental and faunal, especially from limestone caves in the south. Castlepook Cave near Doneraile, County Cork, is particularly important. Its historic excavations produced a large collection of Pleistocene animal remains, later reassessed through modern zooarchaeology and radiocarbon dating. Re-dating has shown that some Irish cave fauna belongs to Marine Isotope Stage 3, long before the maximum phase of the last glaciation. This revision is significant because old collections can preserve material of great age even when their original excavation records are incomplete by modern standards.

The cave record indicates that Ireland, at intervals during this earlier Ice Age phase, supported a cold-adapted large-mammal community. Reindeer are central to the picture; other remains from southern Irish caves include woolly mammoth, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. These finds do not prove that every species occupied every part of the island at the same time, nor that their populations were large or continuous. But together they indicate habitats capable of sustaining grazing and browsing animals, predators and scavengers. The likely landscape included open grassland, herb-rich steppe-tundra and patchy vegetation rather than the dense temperate woodland of later post-glacial Ireland.

Such animals were not symbols of an imagined “lost Ireland”; they are dated biological evidence. Reindeer suggest cool, open environments and seasonal movement across broad landscapes. Mammoth and giant deer imply substantial forage in at least some periods. Hyaenas are especially valuable evidence because cave carnivores can accumulate bones in dens or scavenging places. Yet that same process complicates interpretation. A cave assemblage may contain animals brought in by predators, bones moved by water or sediment, and remains deposited at widely separated times. It is a record of ecological possibility and changing environments, not a snapshot of one living herd outside a cave entrance.

The Castlepook Human Question

This period has unusual importance because of a reindeer femur from Castlepook Cave that has been publicised as dating to approximately 31,000 BCE and bearing a mark interpreted as the result of butchery with a sharp stone tool. If that reading is upheld, it would provide evidence that one or more Upper Palaeolithic people processed a reindeer in Ireland broadly near the era represented by this article. It would push possible human activity on the island many millennia earlier than the long-accepted Late Glacial evidence and would make Castlepook one of the most consequential sites in Irish Palaeolithic research.

However, the claim must be expressed cautiously. The scientific date is an estimate for the animal bone, not a calendar entry for a hunt. Radiocarbon measurements require calibration because atmospheric carbon levels changed through time; calibration produces ranges rather than an exact historical anniversary. Nor does a mark on a bone, by itself, establish the location of killing, the duration of a visit, the number of people involved or a settled population. Castlepook's early excavations disturbed and removed deposits, and its caves were used by natural agencies as well as animals. No securely associated stone-tool assemblage, hearth, dwelling floor, burial, human bone or artwork has yet demonstrated an established Irish community of this age.

The most responsible interpretation is consequently modest but important: a short episode of human presence or carcass processing in Ireland is possible, perhaps by mobile hunters following reindeer or exploiting a favourable local opportunity. Permanent occupation remains unproven. This distinction is not pedantry. A small hunting party, a seasonal visit and a population living continuously on the island are radically different historical propositions. The National Museum of Ireland has continued to characterise clear Palaeolithic human presence as unproven, while the Castlepook material points to a research question of exceptional promise rather than a settled conclusion.

Society Without a Recorded Society

There is no evidence from Ireland at this date for a kingdom, chiefdom, tribe with a recorded name, law, diplomacy or organised warfare. It is equally unsupported to assign a language, ethnicity or later Irish identity to any people who may have visited the island. Terms such as "Irish", "Celtic" and "Gaelic" belong to enormously later historical contexts and should not be carried back into the Upper Palaeolithic. Even the designation "hunter" is an inference from the possible cut-marked reindeer bone and the wider European setting, not a documented social identity.

Comparison with contemporary *Homo sapiens* groups elsewhere in north-west Europe can provide context, but not substitute for Irish evidence. People on the continent made sophisticated stone, bone and antler equipment; they maintained wide social contacts and, in some regions, created cave art and portable art. None of this demonstrates equivalent technologies, trade routes, rituals or artistic traditions in Ireland around 31,939 BCE. There are no Irish monuments, ritual deposits, formal graves or images securely attributable to this period. Religion, learning and culture cannot responsibly be reconstructed beyond the universal observation that any human visitors would have possessed knowledge, skills and social relationships necessary to travel and survive in difficult environments.

Economy, Movement and Survival

If people did reach Ireland during this broad phase, their economy would most plausibly have involved mobile foraging, especially the pursuit or processing of large game. Reindeer meat, fat, hides, sinew, bone and antler could all have been valuable resources to Upper Palaeolithic communities. But that is an interpretation based on ecological context and analogies, not proof that Castlepook hunters used every part of an animal or camped nearby. There is no demonstrated local quarrying, craft production, exchange network, farming or maritime trade at this date.

Movement would have been shaped by terrain and climate. Open habitats could facilitate travel over exposed ground, while ice margins, cold rivers, snowfields and changing sea passages imposed formidable constraints. The Irish Sea region was part of a wider, changing north-west European landscape, not a modern island world with fixed coastlines. Whether a particular human group crossed

from Britain, travelled through periodically exposed coastal terrain, or arrived by another route cannot be answered from the present evidence. The absence of known tools and camps means that even a plausible route remains hypothetical.

The Deep-Time Record

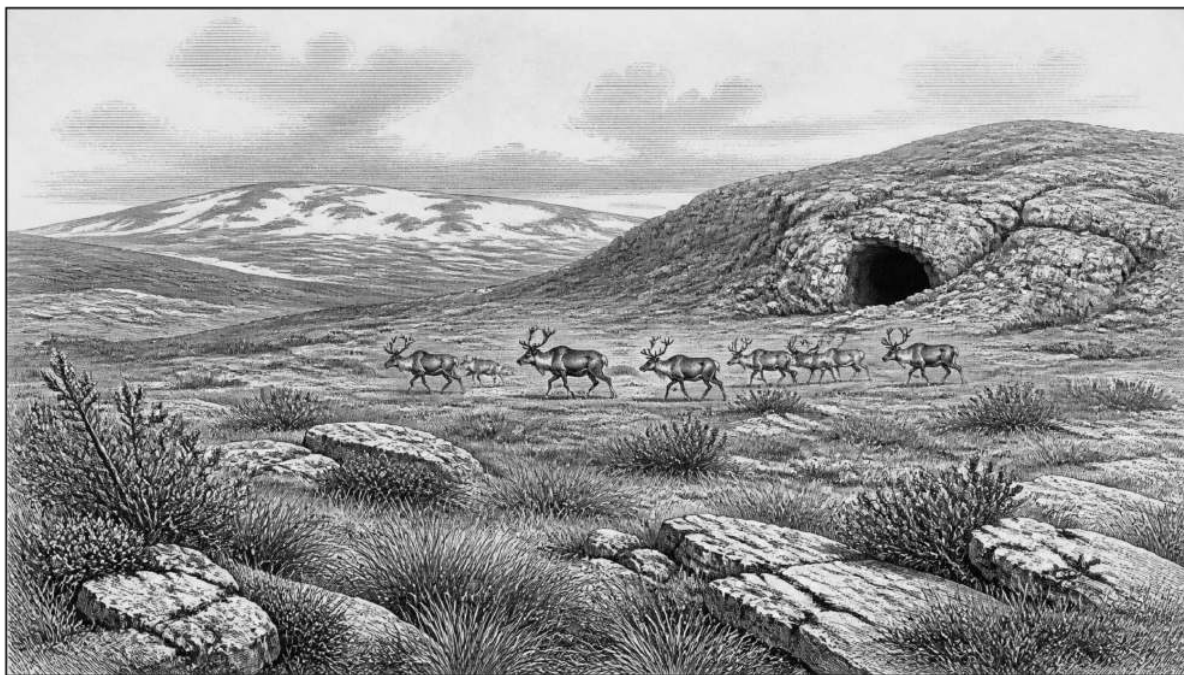
What matters most about Ireland around 31,939 BCE is not a named event but the narrowness of the evidence and the scale of the question. Geological research places the island near the onset of the last major ice-sheet expansion. Cave faunas reveal a much richer Ice Age ecology than modern Ireland possesses. The Castlepook reindeer femur raises the possibility that people briefly entered this landscape far earlier than formerly accepted. Yet the record does not presently support a narrative of villages, political communities or a continuous ancestral population.

The later history of Ireland makes the gap especially striking. Secure, substantial evidence for settlement belongs to the Mesolithic, from about 8000 BCE, after the ice had retreated and post-glacial environments had transformed. Between the possible early Upper Palaeolithic trace and those later hunter-gatherer communities lies a vast span of climatic upheaval, glaciation, sea-level change and archaeological loss. For 31,939 BCE, uncertainty is itself the historical fact: Ireland was a changing Ice Age landscape, rich enough at times for remarkable fauna and perhaps visited by people, but still only faintly visible through the surviving record.

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31938 BCE

Ulster Pollen And Beetles^[63]



Modern calendar-year precision is not available for prehistoric Ireland at 31,938 BCE. The label is a convenient conversion into the modern BCE system, not a date on which an Irish event can be identified. It falls broadly around 33,900 years before AD 1950, within the later part of Marine Isotope Stage 3 (MIS 3), a long and climatically unstable interval of the Late Pleistocene. Dates from this depth of time normally come from radiocarbon measurements calibrated into ranges, from stratigraphy, and from comparison with ice-core and environmental records. They can illuminate phases and conditions; they cannot recover a particular day, season, ruler, battle or community in Ireland.

An Island at the Edge of the Ice Age

Ireland at this point was not the green, wooded island familiar today. It lay in a cold-world north-western European setting, as climates swung repeatedly between relatively milder interstadials and severe cold phases. The great Last Glacial Maximum had not yet reached its fullest development: the major British–Irish Ice Sheet would become much more extensive later, with its greatest volume reconstructed at about 23,000 years ago. Yet ice growth was already becoming an important force in the region. Its advancing margins, changing sea levels and shifting drainage patterns would eventually erase or bury much of the evidence of earlier landscapes and any traces left by people.

For that reason, it would be wrong to imagine a single uniform Ireland. Conditions differed from coast to upland, and changed over centuries and millennia. Evidence from Irish organic deposits beneath later glacial sediments, especially in Ulster, points to cold, largely open environments during parts of MIS 3: grass- and sedge-rich ground, dwarf birch, willow, heaths and scattered hardy herbs rather than continuous

forest. Beetle and pollen evidence indicates strong seasonality. These records are not a weather report for 31,938 BCE, and some pollen was reworked from older deposits, but they provide the best responsible guide to the kind of country available to animals and any human visitors.

Castlepook and the Faunal Record

The most important evidence relevant to this era comes from Castlepook Cave near Doneraile in north County Cork. The limestone cave system has produced one of Ireland's richest Late Pleistocene collections. Antiquarian excavations recovered thousands of bones, while later re-examination, radiocarbon dating and renewed fieldwork have made the collection far more informative. It preserves evidence of a varied animal community across a long span before the Last Glacial Maximum, rather than a single perfectly preserved moment.

Radiocarbon programmes have shown that animals occupied or reached southern Ireland during the wider period from at least about 45,000 to 20,000 years ago. At Castlepook, dated material includes reindeer, brown bear, giant deer, spotted hyaena and woolly mammoth; arctic fox, hare and lemming also belong to the broader Ice Age fauna known from the site and comparable Irish deposits. Not every species lived there together, and a cave bone need not show that the animal died at the cave entrance. Carnivores could drag carcass parts underground, water and sediment could move material, and the old excavations did not meet modern standards of recording. The secure conclusion is nevertheless substantial: parts of Ireland supported, or were accessible to, a changing cold-climate mammal fauna during MIS 3.

This has large implications for regional change. Ireland was not biologically isolated in the way it would later become. Falling sea levels exposed extensive areas of the continental shelf around north-west Europe, while glacial and marine geography altered the possible routes available to animals. However, lowered sea level does not automatically mean a simple, walkable land bridge from Ireland to Britain or the Continent. The precise configuration of the Irish Sea at this early date remains difficult to reconstruct. Faunal connections are evidence that animals reached Ireland; they do not by themselves specify whether every crossing was made over dry land, ice, short sea passages or a shifting combination of routes.

A Possible Human Trace

There is one especially arresting but still limited clue to human activity. A reindeer femur from the historic Castlepook collection has been reported as roughly 33,000 years old and to carry a deep mark interpreted as damage made by a sharp stone tool during butchery. If that identification withstands continued specialist scrutiny, it would place a human visit to Ireland in the Upper Palaeolithic, many millennia before the island's first securely established post-glacial communities. It is directly relevant to the world represented by 31,938 BCE, but it must not be turned into proof of an event in that exact modern-numbered year.

The distinction matters. Radiocarbon dating establishes the approximate age of the animal's death, expressed as a calibrated range rather than an exact calendar year. Interpreting a mark on bone requires a different line of evidence: its shape, angle, depth, location and microscopic character must be weighed against damage caused by teeth, trampling, sediment movement, excavation tools and natural breakage. The old cave context adds further difficulty. Nor has a securely associated Upper Palaeolithic hearth, stone-tool assemblage, dwelling floor, human burial or stratified hunting camp yet been recovered in Ireland for this period.

The most cautious interpretation is therefore that Ireland may have received brief hunter-gatherer incursions during a favourable part of the Late Pleistocene, perhaps connected with the exploitation of large game such as reindeer. The evidence does not demonstrate a permanent population, a named people, a migration of families, or uninterrupted occupation. It does not allow us to identify where such visitors came from, how many there were, what language they spoke, or whether they crossed water. A lone butchered bone is historically important precisely because it is so rare, not because it can bear an elaborate narrative.

Society, Work and Movement

If people did reach Ireland around this broad horizon, their social world is best understood by careful comparison with Upper Palaeolithic hunter-gatherers elsewhere in north-west Europe, while keeping the comparison separate from Irish proof. Such groups generally lived in small, mobile bands whose decisions followed season, game movements, shelter, raw materials and social ties. A reindeer carcass could provide meat, fat, hide, sinew, bone and antler. But Ireland has not yielded the implements that would demonstrate precisely how people hunted, divided labour, prepared food, maintained clothing or made shelters at this date.

There is consequently no evidence for political institutions, territories, chiefs, diplomacy, warfare or organised trade in Ireland in 31,938 BCE. It would be anachronistic to project later tribal politics onto a fleeting and uncertain Palaeolithic presence. Nor is there evidence for farming, animal husbandry, villages, fields, pottery or metalworking. Any human activity would have belonged to a mobile foraging economy embedded in a much wider European ecological zone, not to a settled Irish society.

Likewise, religion, art and learning remain beyond recovery here. Upper Palaeolithic peoples elsewhere made sophisticated images, ornaments, tools and symbolic objects, but no comparable securely dated artistic or ritual material is known from Ireland at this horizon. Caves should not automatically be called sanctuaries: Castlepook's principal value for this period is as a trap, den, sediment store and archive of animal remains. The absence of evidence is not evidence that visitors lacked beliefs or culture; it means that Irish archaeology cannot responsibly describe them.

What the Date Can Mean

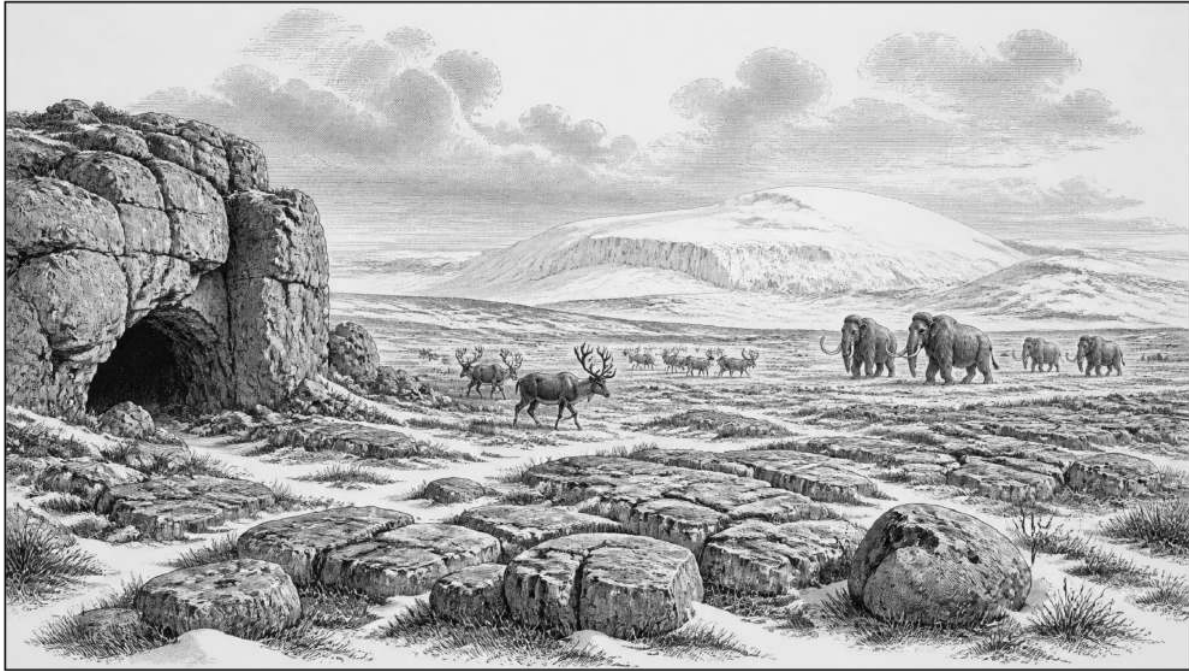
The significance of 31,938 BCE for Irish history is thus environmental and evidential rather than event-driven. Ireland was part of an Ice Age world in transition, inhabited by cold-adapted and wide-ranging mammals, with glaciation intensifying but not yet at its later maximum. Southern limestone caves preserve fragments of that lost world, while later ice and erosion have made open-air evidence exceptionally elusive. New work at Castlepook—including renewed excavation, improved radiocarbon methods, sediment analysis and ancient-DNA research—offers the prospect of refining the picture.

For now, the responsible historical view is restrained but compelling. A reindeer bone may record the work of Upper Palaeolithic hunters; a rich fossil assemblage securely records Ice Age animals; and glacial research explains why both people and evidence were precarious at Europe's Atlantic edge. Around this modernly numbered year, Ireland cannot yet be shown to have had a continuous human population. It can, however, be seen as a changing Pleistocene landscape where the possibility of rare human visitation deserves serious investigation.

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31937 BCE

Periglacial Shrub Tundra ^[64]



A Date Beyond Annals

31,937 BCE cannot be treated as a year in the ordinary historical sense. No Irish written record, named ruler, settlement sequence or securely dated event can be assigned to a single calendar year so remote in time. Indeed, even the conversion between BCE dates and scientific chronologies needs care: archaeologists normally work with radiocarbon years before present (BP, where “present” is 1950) and calibrated calendar ranges, each with margins of uncertainty. The appropriate setting is therefore not a supposed episode in 31,937 BCE, but Ireland in the later part of the Last Glacial Period, approximately 34,000 calendar years ago.

This was within the Upper Palaeolithic in European archaeological terms, but Ireland’s evidence is exceptionally thin. Around this horizon, the island was approaching the severe cold phase that culminated in the Last Glacial Maximum, conventionally dated in Ireland and Britain to roughly 26,000–19,000 years ago. The record permits a cautious reconstruction of landscape, animals and possible human visits. It does not permit a narrative of an Irish people, polity or continuous settlement.

An Unstable Ice-Age Landscape

At about this date, Ireland was not yet necessarily the uniformly ice-covered country that it became during the later glacial maximum. Research on the British–Irish Ice Sheet indicates complex advances and retreats rather than one simple, island-wide freeze. Some reconstructions suggest that Ireland had remained largely ice-free until about 32,000 calibrated years BP, while other work identifies mountain ice

caps and advancing glaciers in western and south-western Ireland during the colder stages around and after 32,000 BP. The precise extent of ice at any one place remains debated because the surviving landforms chiefly record later, more extensive glaciation.

That uncertainty matters. The Ireland of this broad period was not a green, wooded island recognisable from later prehistory. It contained cold, open environments shaped by frost, sparse vegetation, exposed rock, river systems and, locally, ice. Sea level was far lower than today because so much water was locked in global ice sheets. The coastlines of modern Ireland did not exist in their present form; broad areas of the continental shelf were dry land or shallower marine terrain. Connections towards Britain and continental Europe were consequently easier for animals than they would become after post-glacial sea-level rise, although the exact routes available at different moments are still being investigated.

For people or large mammals moving through this north-western edge of Europe, such landscapes offered both opportunities and hazards. Open ground could support grazing herds, but conditions were cold, highly seasonal and changeable. Caves in limestone districts were important not because they prove human habitation, but because they trapped and preserved bones that open-air landscapes, repeatedly altered by ice and erosion, often lost.

Castlepook and the Animal World

The most important Irish evidence relevant to this distant horizon comes from Castlepook Cave near Doneraile in north County Cork. Excavated principally in the early twentieth century by the naturalist Richard J. Ussher, its deposits yielded one of Ireland's richest known collections of Pleistocene vertebrate remains. The material is held largely through the National Museum of Ireland collections and has been revisited by modern zooarchaeological research. Its importance lies not only in the variety of species, but also in its reminder that the Ice-Age island supported a far broader fauna than historic Ireland.

Recorded Castlepook animals include reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Individual finds have different dates and cannot simply be treated as the remains of one simultaneously living community. Nor were all bones deposited in the same way: carnivores, scavenging, water movement, cave collapse and early excavation methods all affected the assemblage. Nevertheless, radiocarbon results from Castlepook and other Irish caves show that varied cold-period fauna occupied or reached Ireland between at least about 45,000 and 20,000 BP. A giant-deer bone from Castlepook, for example, produced a radiocarbon age of $32,060 \pm 630$ BP; this is a useful broad chronological marker, not a date for a particular year or season.

Reindeer are especially significant for imagining the living landscape. Their presence indicates cold, open habitats and suggests mobile herds capable of moving over wide territories. Mammoth and giant deer reinforce the picture of a substantial grazing fauna, while hyaena and wolf show that large predators and scavengers occupied the same ecological world. This was not an untouched wilderness in a romantic sense, but a functioning food web in which caves could serve as dens, refuges, traps for remains or places where bones accumulated through many separate episodes.

A Possible Human Trace

A reindeer femur fragment from Castlepook has been reported as bearing deep marks consistent with butchery by a stone tool and as dating to about 33,000 years ago. If the modification is accepted as human-made, it is directly relevant to the period around 31,937 BCE. It would indicate that a person used

a sharp lithic edge to dismember or process a reindeer in Ireland during the Upper Palaeolithic, far earlier than the once-standard view that people first reached the island only after the final retreat of the ice.

The claim deserves both attention and restraint. The Castlepook bone derives from old excavations whose deposits were disturbed, incompletely recorded and sometimes re-sorted by natural processes. The reported date is a radiocarbon result expressed in years BP, rather than an exact calendar-year identification. One modified bone does not establish that Castlepook was a human camp, that a population lived permanently nearby, or that Ireland had continuous occupation. Nor does it securely identify the visitors with a particular named Upper Palaeolithic culture known from Britain or continental Europe.

It is best understood as evidence for possible human activity or passage, not proof of an Irish society in the later historical sense. Small hunting groups elsewhere in north-west Europe were highly mobile and could exploit seasonal animal movements. If people did reach the Cork region, they may have followed reindeer, processed a carcass encountered or acquired in the landscape, and left little beyond a single altered bone. Stone tools, hearths, shelters, burials, art and living surfaces of comparable age have not been securely recovered in Ireland.

Society, Belief and Exchange: What Cannot Be Claimed

There is no responsible evidence for political affairs, leaders, warfare, diplomacy, formal territories or institutions in Ireland at this point. Equally, there is no Irish evidence for religious buildings, graves, ritual practices, language, art or organised learning. The cave itself should not be called a shrine, a settlement or a hunting station merely because it contains striking animal remains. Such labels would turn archaeological possibility into fact.

Economy and trade must also be treated narrowly. A butchered reindeer bone, if humanly modified, supports the practical use of animal resources: meat, marrow, hide, sinew and bone may all have been valuable to hunter-gatherers. It does not demonstrate regular exchange networks or local manufacture. Any connection with Britain or continental Europe is an inference from geography, low sea levels, animal dispersal and the known mobility of Upper Palaeolithic communities beyond Ireland, rather than evidence of a documented Irish route or trading partnership.

Why the Evidence Is So Fragmentary

Ireland's later glaciation helps explain the silence. Ice sheets and meltwater eroded, buried and rearranged older ground surfaces, while rising seas drowned former coastal plains where camps may once have stood. Archaeologists therefore depend heavily on caves, museum collections, radiocarbon dating, microscopic inspection of marks on bone, palaeontology, sediment analysis and reconstruction of former ice margins. Each technique produces evidence of a different kind and with different limits.

The contrast with the much later record is instructive. The securely dated butchered brown-bear patella from Alice and Gwendoline Cave in County Clare belongs to the terminal Pleistocene, calibrated to 12,810–12,590 cal BP, and is separated from Castlepook by roughly twenty millennia of poorly documented change. Sustained settlement is more securely visible only in the Mesolithic, from around 8000 BC, when hunter-gatherers left camps, tools and other traces across a warmer post-glacial Ireland.

A Cautious Place in Irish History

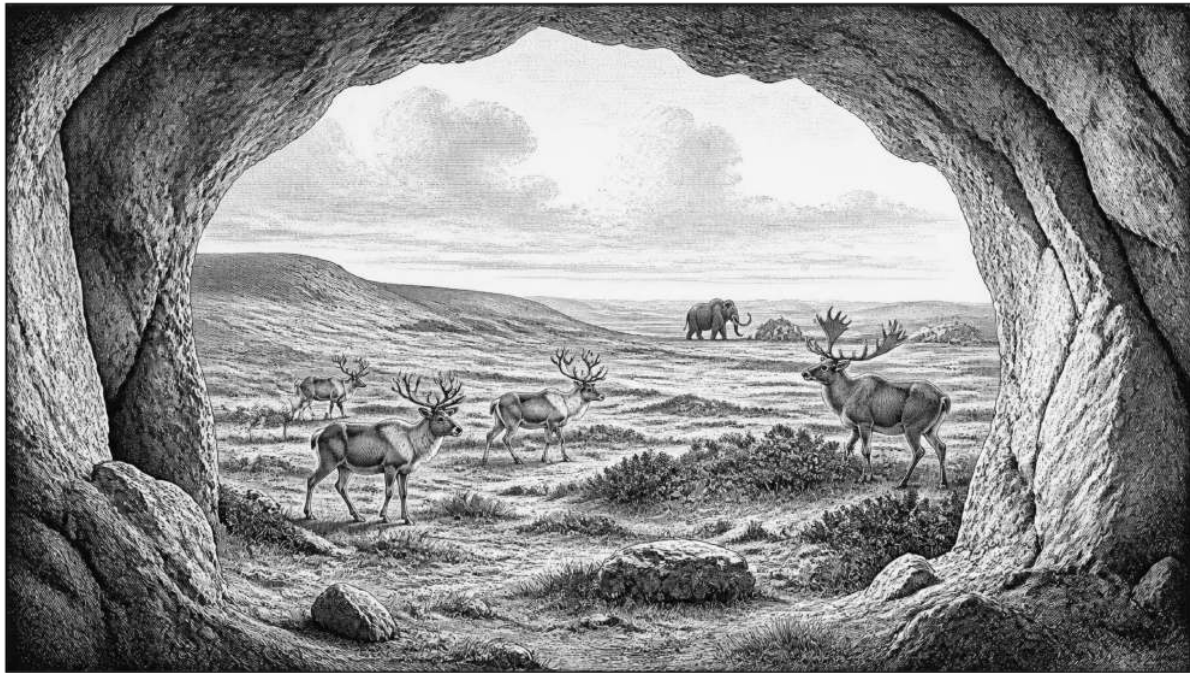
For 31,937 BCE, the most defensible history is environmental and evidential. Ireland was a cold, changing north-west European land, inhabited by an impressive Ice-Age fauna and moving towards the greater glaciation of the Last Glacial Maximum. Castlepook Cave in County Cork preserves a rare window onto that world. Its reindeer bone offers a potentially important sign that humans may have entered and exploited Ireland at about this remote horizon, but it cannot bear the weight of claims for permanent colonisation or a developed Irish culture.

The real significance of the period lies in that tension between possibility and proof. It reminds us that the human past of Ireland may extend far deeper than older textbooks allowed, while demanding that every claim remain proportionate to the fragile evidence from which it is made.

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31936 BCE

Castlepook's Putative Toolmark ^[65]



31,936 BCE is a modern calendar label, not a year for which Ireland's archaeological record can identify an event, ruler, battle or settlement. It falls, by simple conversion, about 33,900 years before the conventional radiocarbon baseline of 1950, within the later part of the Pleistocene and Marine Isotope Stage 3. That arithmetic is useful only as orientation. Archaeologists date material from this depth of time in radiocarbon years before present and calibrated ranges, often with substantial uncertainty; they do not possess calendar-year precision for Ireland in this period. The responsible picture is therefore one of changing landscapes, animal movements and fragmentary cave evidence, rather than an annual chronicle.

A Landscape on the Edge of Glaciation

This was a very different Ireland from the familiar green island of later millennia. Sea level was much lower than today because large volumes of water were held in northern ice sheets. Ireland, Britain and the continental shelf formed a changing north-west European margin, though the exact routes by which animals or people could have moved varied with sea level, coastlines, ice and climate. It is unsafe to imagine the modern Irish Sea or Atlantic coastline simply transplanted into the Ice Age.

At roughly 34,000 years ago, Ireland stood before the fullest expansion of the last British–Irish Ice Sheet rather than at its climatic maximum. Large reconstructions indicate that ice-sheet growth accelerated after about 31,000 years before present, while maximum ice volume and broadest extent came much later, around 27,000–23,000 years ago, with regional advances and retreats occurring at different times. Other work suggests that much of Ireland remained unglaciated until about 32,000 calibrated years

before present. These are broad, modelled chronologies, not a guarantee that every valley or coast was ice-free in 31,936 BCE. They nevertheless place this date in a transitional world: cold, climatically unstable and increasingly vulnerable to ice expansion.

Later glaciers profoundly altered the evidence. Ice eroded bedrock, reworked sediments and removed or buried many surfaces on which camps, tracks or hearths might once have stood. The eskers, drumlins, corries and glacial valleys visible across Ireland today are part of that much later legacy. Their existence also explains why a lack of early sites cannot automatically prove that people or animals never reached the island. It does, however, mean that claims for deep Palaeolithic occupation require unusually strong evidence.

Caves and the Faunal Record

The most informative evidence comes from caves, especially in the limestone country of southern Ireland. Castlepook Cave, near Doneraile in north County Cork, is central to this story. Excavations undertaken in the late nineteenth and early twentieth centuries recovered a remarkable but difficult collection of animal remains. Subsequent research has identified or reported mammals including woolly mammoth, reindeer, giant deer (*Megaloceros giganteus*), brown bear, wolf, red fox, Arctic fox, spotted hyaena and lemmings. Such animals show that at least parts of Ireland supported a far richer Ice Age fauna than the island would possess after the glaciers and post-glacial seas reshaped its ecological connections.

The list should not be turned into a single illustrated scene or treated as proof that every species lived together at exactly the same moment. Castle deposits accumulated over long periods; bones may have been moved by water, scavengers, burrowing animals or people; and early excavations did not record deposits to modern standards. Cave carnivores themselves could carry prey into sheltered chambers. Spotted hyaena remains and heavily chewed bones are particularly important reminders that some caves were animal dens, not human homes. The strongest conclusion is that southern Irish caves preserve evidence for successive Pleistocene animal communities, including communities before the Last Glacial Maximum.

Modern redating has made that conclusion more secure while making older neat chronologies less secure. The Irish Quaternary Fauna Project showed the value of accelerator radiocarbon dating for museum collections. Later work using improved collagen pretreatment found that some earlier dates from Castlepook, Foley and Shandon caves were too young, pushing parts of the southern Irish fauna further back into Marine Isotope Stage 3. Researchers have consequently proposed that species such as giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum, perhaps around 40,000 calibrated years ago. Around the modern label 31,936 BCE, then, mammal evidence is directly relevant, but it is usually dated in wide ranges and must be assessed specimen by specimen.

Was There a Human Presence?

No securely dated settlement, house, hearth, burial or stratified stone-tool assemblage is known from Ireland for this point in time. Nor is there accepted evidence for a permanent population. This absence matters. It means that historians cannot responsibly describe named communities, family life, hunting territories or a continuous colonisation of Ireland in 31,936 BCE.

There is, however, a reason for careful attention to Castlepook Cave. A reindeer bone from its historic collection has been reported as bearing a mark interpreted as stone-tool damage and as dating to about 33,000 years ago. If both the dating and anthropogenic interpretation are confirmed through full publication, contextual reassessment and comparison with natural damage, it could indicate a brief Upper Palaeolithic human visit or butchery episode close to this article's chronological horizon. It would not by itself establish a settlement or prove that people lived in Ireland year-round. At present it is best regarded as an important research claim, not as a foundation for a detailed human history.

The contrast with the better-published evidence from Alice and Gwendoline Cave, County Clare, is instructive. There, cut marks on a brown-bear kneecap have been argued to show human activity around 12,810–12,590 calibrated years before present. Even that much later evidence is a single, exceptional proxy rather than a village site. It demonstrates the kind of direct, dated material needed to make a case for human presence, while underlining how sparse Ireland's Palaeolithic record remains.

No Politics, but a Wider World

Political affairs, diplomacy and organised warfare cannot be recovered for Ireland at this date. There were no recorded kingdoms, tribal names, laws or monuments, and there is no evidence from which to reconstruct political boundaries. Likewise, there is no Irish evidence for religious buildings, formal burials, art, writing, schools or enduring ceremonial places around 31,936 BCE. Silence here is not evidence that Ice Age people elsewhere lacked culture. Upper Palaeolithic communities in parts of Europe made sophisticated tools, ornaments and art. It is simply not evidence for Ireland.

If people did occasionally reach the island, they would have belonged to wider mobile hunter-gatherer worlds shaped by seasonal weather, animal distributions and safe routes through a changing north-west European landscape. That is an inference from the broader European Upper Palaeolithic, not a fact demonstrated by an Irish camp. A possible butchery mark could imply the acquisition of meat or carcass processing; it cannot reveal whether a reindeer was hunted, scavenged or encountered after death, nor whether visitors travelled in a small party or returned repeatedly.

There is equally no evidence for farming, herding, crop cultivation, metalworking, pottery production, long-distance exchange networks or maritime trade in Ireland at this time. The relevant economy was ecological rather than agricultural: the movement and survival of large mammals and their predators in a cold, fluctuating environment. Caves may have offered temporary shelter to animals and, potentially, to people, but their principal historical value is as archives of bone, sediment and changing climate.

Evidence, Interpretation and Future Work

The story of Ireland around 31,936 BCE is therefore not one of an identifiable Irish society but of a place at the north-western edge of Ice Age Europe. Faunal remains demonstrate that animals repeatedly reached and occupied parts of the island before the full glacial maximum. Glacial reconstructions show that this living landscape was soon to be transformed by the growing British–Irish Ice Sheet. The combination helps explain both the possibility of fleeting human contact and the extraordinary scarcity of surviving archaeological traces.

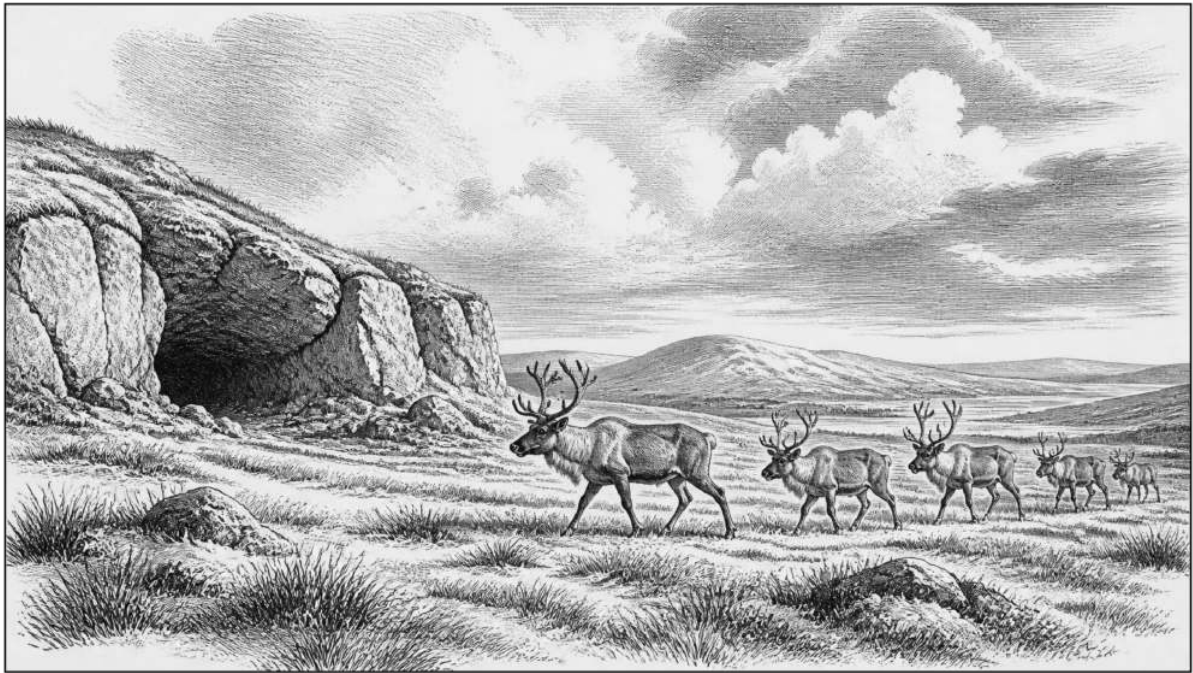
Future work may change the balance of evidence. Re-excavation, refined radiocarbon methods, sedimentary ancient DNA, microscopic study of bone surfaces and improved ice-sheet modelling can test whether particular animals, deposits and possible tool marks belong together. Until then, the clearest

account is also the most cautious: around this modernly numbered year, Ireland was an Ice Age landscape with demonstrable Pleistocene fauna, uncertain access routes and no securely established human settlement.

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31935 BCE

Approaching Last Glacial Maximum^[66]



31,935 BCE is a modern calendar label, not a date that can be recovered from the Irish archaeological record with year-by-year precision. No written calendar, named individual, settlement sequence or dated event allows historians to describe this particular year. The responsible approach is instead to place it within a much broader Late Pleistocene interval: Marine Isotope Stage 3, during the long cold phase before the Last Glacial Maximum. Radiocarbon results from this depth of time are expressed as ranges and must be calibrated; even then, they identify intervals of probability rather than a single certain calendar year. Around this point, Ireland was an environmentally changing north-west European landmass whose clearest archive is animal bone, cave sediment and glacial geology.

An Ice-Age Landscape

At roughly 34,000 calendar years before present, the great ice sheet that would later dominate Ireland had not yet reached its maximum extent. Globally, ice sheets were building towards the Last Glacial Maximum, conventionally placed at about 26,500–19,000 years ago. Ireland's climate was nevertheless far colder, more open and more variable than that of today. Marine Isotope Stage 3 was marked by abrupt swings between relatively milder interstadials and severe stadials. It would be misleading to imagine one fixed, unbroken scene of snow and glacier across the entire island. Conditions, vegetation cover, coastlines and animal ranges could change substantially over centuries and millennia.

The landscape was not the wooded island familiar to modern observers. In favourable episodes, grassland, herb-rich steppe-tundra, scrub and scattered cold-adapted vegetation could support grazing animals. In harsher phases, exposed ground, frost-shattered slopes and sparse plant cover probably expanded. Rivers followed courses different from those of the present, while substantially lower global

sea levels altered the surrounding continental shelf. Yet neither low sea level nor the presence of continental animals automatically proves a simple, continuous land bridge or a particular route into Ireland. The changing Irish Sea basin, ice margins and coastlines make movement a geological question still studied through offshore mapping and sea-level modelling.

Castlepook's Fragmentary Record

The most important Irish evidence relevant to this period comes from Castlepook Cave near Doneraile in north County Cork. Excavated principally in the early twentieth century, the cave produced one of Ireland's richest known collections of Late Pleistocene vertebrate remains. Geological Survey Ireland describes more than 2,000 surviving bones and a long series of radiocarbon results from individual specimens, broadly spanning about 45,700 to 19,950 radiocarbon years before present. This makes Castlepook exceptionally valuable for reconstructing the animal world before and during the approach to the Last Glacial Maximum.

Its collection includes remains attributed to woolly mammoth, giant deer, reindeer, brown bear and spotted hyena, as well as wolf, Arctic fox, mountain hare and lemmings. That list must be handled carefully. It demonstrates that these animals occurred in Ireland across the broad time-depth represented by the cave archive; it does not show that every species occupied the same valley in the same season, let alone in 31,935 BCE itself. Cave deposits are accumulations, often formed over very long periods. Water movement, carnivore activity, earlier excavation methods and disturbance can mix or obscure their original relationships.

Spotted hyena is especially important for interpreting the site. Hyenas can drag carcass parts into dens, break bones, leave tooth marks and create concentrations that might otherwise resemble the refuse of human hunters. Castlepook has evidence consistent with such carnivore use. Therefore, an animal bone in the cave is not by itself evidence of hunting, habitation or a human meal. The cave tells a secure story of Ice-Age fauna; the human story is much slighter.

A Possible Human Trace

The date has particular significance because a reindeer femur from the Castlepook collection has been reported as bearing a mark interpreted as stone-tool butchery. Public reports place the bone at about 33,000 BCE, close enough to the modern label 31,935 BCE to make it directly relevant. If that interpretation and dating are sustained, the mark represents an extraordinarily early sign that people reached Ireland: a sharp tool used on an animal carcass. It would move evidence of human activity on the island far earlier than the better-known Late Upper Palaeolithic evidence from County Clare, dated to around 12,800–12,600 cal BCE.

But the claim must not be enlarged beyond the evidence. The Castlepook specimen derives from an old collection rather than a newly excavated, sealed camp surface, and it has not produced a house floor, hearth, lithic scatter, human burial or sequence of repeated occupations. It cannot demonstrate a permanent population, a village, a named people or continuous settlement. Nor can it show whether one small party crossed briefly, returned seasonally, or belonged to an occupation episode otherwise erased by later glaciation and erosion. The most cautious conclusion is that Ireland may have been visited by Upper Palaeolithic hunters or scavengers during this wider period, while evidence for their sustained residence remains absent.

Food, Mobility and Daily Life

If people did reach Ireland at this time, the reindeer bone offers the narrowest possible glimpse of subsistence: carcass processing. A cut mark may relate to removing meat, separating a limb or taking sinew, but one modified bone cannot identify the full purpose. It does not prove organised reindeer hunting, and it certainly does not justify a detailed account of diet. Mammoth, deer and reindeer were potentially valuable sources of meat, fat, hides, bone and antler, while smaller mammals and birds may also have mattered; these are reasonable possibilities drawn from the faunal record and wider Upper Palaeolithic practice, not demonstrated Irish behaviours.

There is no evidence in Ireland for farming, herding, pottery, metalworking, permanent fields or stored agricultural surplus in this period. Any human economy was necessarily one of foraging, hunting and movement through a demanding seasonal environment. Likewise, there is no Irish evidence for trade networks, though human arrival itself would imply some connection—direct or indirect—with populations elsewhere in north-west Europe. A group capable of reaching or exploiting Ireland would have needed knowledge of terrain, animals and weather, but its routes, watercraft, languages and social organisation cannot be recovered from Castlepook.

No Politics, No Recorded Conflict

Political affairs, diplomacy and warfare cannot responsibly be reconstructed for 31,935 BCE. There were no states, kingdoms, borders or written agreements in Ireland, and no archaeological assemblage here identifies a leadership structure or conflict between groups. Predation was a real feature of the landscape: wolves and hyenas competed within animal ecosystems, while people, if present, faced the risks of cold, distance and large mammals. That is not evidence of human warfare. Equally, there is no basis for assigning ethnic, national or ancestral identities to any possible visitors. They were not “Irish” in a later cultural or political sense, even though their actions, if confirmed, form part of the deep human history of the island.

Religion, Culture and Knowledge

No artwork, ornament, burial, shrine or musical object securely belonging to this Irish horizon is known. It would be tempting to import the magnificent cave art, figurines and elaborate stone-tool traditions of contemporary Upper Palaeolithic Europe into Ireland, but they have not been found at Castlepook or elsewhere on the island for this date. Wider European evidence shows that human communities of the period could possess sophisticated technical knowledge and symbolic cultures. It does not prove that a comparable object, rite or tradition was practised in Ireland.

The learning that can be inferred locally is ecological rather than ceremonial: the successful use of a landscape required close attention to animal movement, shelter, seasonality and raw materials. Yet even this remains an inference from the demands of survival, not an excavated lesson in Irish culture. The silence of the record is itself historically meaningful. Later ice advance, shifting rivers, sea-level change and the scarcity of protected deposits have probably removed or buried much evidence that might once have existed.

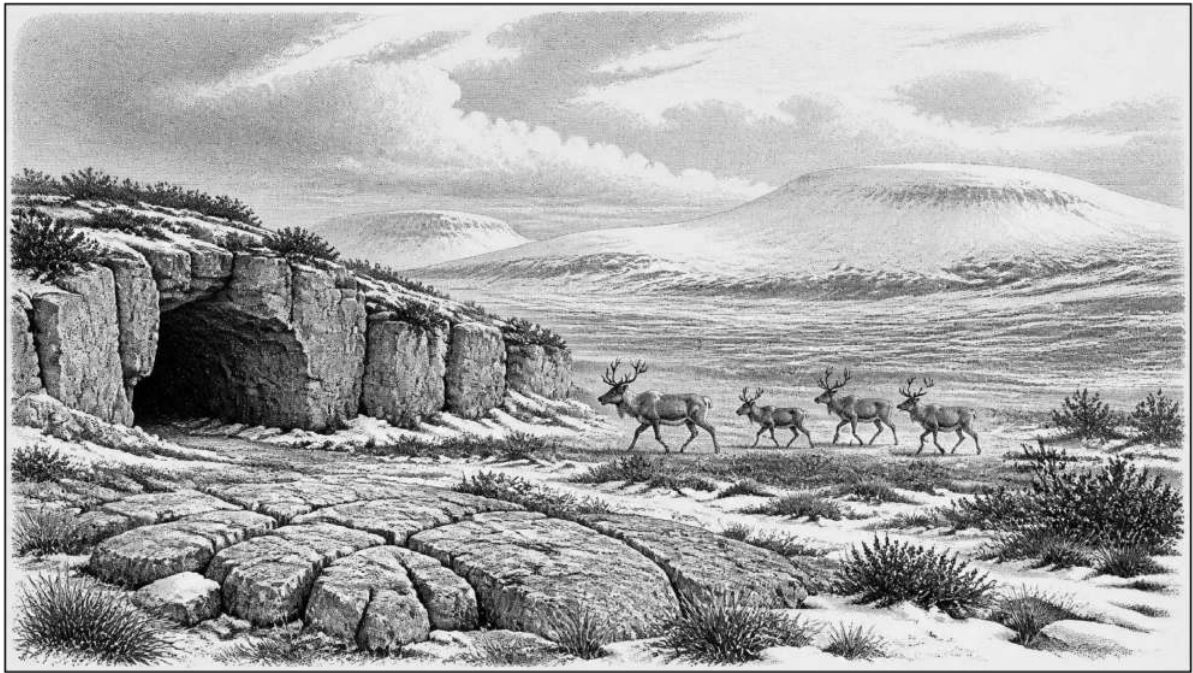
A Threshold Rather Than an Event

For Ireland, 31,935 BCE is best understood as a threshold in deep time, not as a date on which an identifiable historical episode occurred. The island supported a striking Ice-Age fauna in an unstable cold-world environment, and Castlepook Cave preserves a rare window into it. The reported butchered reindeer bone raises the serious possibility of an early human visit, but it remains a tiny trace rather than proof of settled society. The major development was environmental: the approach of the glacial maximum that would transform the Irish landscape and make the already fragile Palaeolithic record still harder to find. What survives is enough to reveal an inhabited animal world and perhaps a fleeting human footprint—no more, but importantly, no less.

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31934 BCE

Ruth Carden's Cut Mark ^[67]



A Calendar Label, Not an Event

“31,934 BCE” is a modern way of naming a point far beyond the reach of any Irish calendar, written record or year-by-year archaeological sequence. It must not be treated as the date of a known event. In the conventional archaeological system of years before present, where “present” means 1950, it corresponds broadly to about 33,884 years ago. That places Ireland in the Late Pleistocene, within Marine Isotope Stage 3 (MIS 3), a climatically unstable interval of the last Ice Age.

Modern calendar-year precision is not available for Ireland at this depth of time. Radiocarbon determinations are measurements with statistical uncertainty, not dates in an ancient calendar; they also require calibration against changing atmospheric radiocarbon levels. Where evidence is securely dated, archaeologists therefore use calibrated ranges, normally expressed as cal BP. The responsible question is not what happened in Ireland in one notional year, but what the surviving geological, animal and archaeological evidence can illuminate about the island around the thirty-fourth millennium before present.

The answer is necessarily cautious. Ireland was not the green, wooded island familiar today, and it had no recorded inhabitants, named peoples, rulers, settlements or monuments. Yet it was not simply a blank on the map. Cave deposits, animal bones, glacial landforms and regional reconstructions show that the island lay within a changing north-west European Ice Age world. The closest possible clue to human activity is a reindeer bone from Castlepook Cave in north County Cork, reported as about 33,000 BCE and bearing a mark interpreted as stone-tool butchery. Its importance is considerable, but its limitations are equally important.

Ireland Before Full Glaciation

At this approximate date, Ireland was entering the severe phase that culminated in the Last Glacial Maximum, but the maximum lay in the future. The British–Irish Ice Sheet did not grow as one uniform mass at a single moment. Recent reconstructions describe rapid expansion after about 31,000 cal BP, while evidence from uplands in central and northern Ireland indicates that some ground remained ice-free until at least roughly 34,000 years ago. Other research summarises Ireland as largely ice-free until around 32,000 cal BP before later full glaciation. Such conclusions are reconstructions with regional uncertainty, not a weather report for a particular day in 31,934 BCE.

The crucial implication is that the island should not automatically be pictured as entirely buried beneath ice at this earlier point. Some uplands may already have held glaciers or perennial snowfields, while exposed lowlands and coastal areas could have supported cold-climate vegetation and mobile animal populations. Ice margins, meltwater, windblown sediment and freeze-thaw processes changed landscapes repeatedly. The later advance of ice would erode, rework or bury much earlier ground surface, helping to explain why the Irish record of this period is so meagre.

Sea level was substantially lower than today because much of the world's water was locked in northern ice sheets. The outlines of the Irish Sea basin, shorelines and possible routes between Ireland, Britain and continental Europe were therefore different. It is safest not to call this a simple land bridge. Whether a particular route was dry ground, ice, water, estuary, coastal plain or a difficult combination of these depended on time and locality. Any visitors reaching Ireland would have crossed a demanding, changeable northern landscape rather than travelled through a stable, familiar country.

The Animal Evidence

The strongest direct evidence for Ireland around this broad period is palaeontological. Castlepook Cave, near Doneraile, is especially important because its excavations produced one of the island's richest collections of Pleistocene vertebrate remains. The collection includes animals associated with cold, open environments and with the great ecological fluctuations of MIS 3: reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings, woolly mammoth and spotted hyaena are among the species identified from the cave assemblage.

That list must not be turned into a single tableau. Cave deposits accumulated over long periods; bones may have been brought in by carnivores, moved by water, disturbed by sediment collapse or collected during early twentieth-century excavations whose recording standards cannot answer every modern question. Re-dating work has shown that some older Irish cave determinations were significantly inaccurate because of earlier laboratory methods and bone-treatment procedures. The fauna proves that these animals reached Ireland at different points in the Late Pleistocene; it does not prove that every species grazed or hunted together in northern Cork in 31,934 BCE.

Nevertheless, reindeer provide a historically supportable focus. Their presence points towards open, cold-country habitats rather than broad forest. Such landscapes could include grasses, herbs, sedges, dwarf shrubs and sparse patches of woody vegetation, varying sharply with moisture, altitude and short-term climatic shifts. Large herbivores would have been valuable prey for human groups elsewhere in north-west Europe, while wolves and hyaenas were competitors and scavengers. The Irish evidence indicates a landscape capable, at intervals, of sustaining substantial mammals, but it does not demonstrate a settled human economy.

The Castlepook Question

A reindeer femur from Castlepook has been reported by researcher Ruth Carden and by Cork heritage publications as carrying a cut mark made with a sharp stone tool when the animal was butchered. It has been presented as dating to approximately 33,000 BCE. If that interpretation is confirmed, it would be the closest evidence presently known for human activity in Ireland around the date considered here: not a village or a population census, but an episode in which people processed a reindeer carcass.

The distinction is fundamental. No securely associated stone-tool assemblage, hearth, dwelling surface, burial, artwork or human skeleton of this age has been published from Ireland. Nor has a stratified settlement demonstrated enduring occupation in the thirty-second millennium BCE. Castlepook's deposits have a complicated history, and the original large-scale excavations took place between 1904 and 1913. Much of the collection lacks the tightly controlled context that a modern excavation would provide. The cut-mark interpretation is therefore best described as important, promising evidence for a possible Upper Palaeolithic visit or short-lived activity, rather than proof of permanent colonisation.

The contrast with the better-established evidence from Alice and Gwendoline Cave in County Clare is instructive. There, a brown-bear patella with clear lithic-tool cut marks was independently radiocarbon dated to calibrated ranges of 12,810–12,590 and 12,810–12,685 cal BP. That much later find is peer-reviewed evidence of human presence in terminal Pleistocene Ireland. It cannot be projected backwards to 31,934 BCE. Instead, it shows why careful examination, direct dating, taphonomic study and scepticism about disturbed cave deposits are essential to the story of Ireland's earliest people.

People, Society and Everyday Life

If people did reach Ireland around this time, they were mobile hunter-gatherers in the broad Upper Palaeolithic world of north-west Europe. A reindeer carcass could have supplied meat, fat, marrow, hide, sinew and bone. But this is a reasonable interpretation of the economic value of an animal, not a demonstration of precisely how Castlepook's reindeer was used. The surviving evidence cannot identify the number of people involved, their season of arrival, their route, their language, their tool kit or whether they returned.

There is no basis for speaking of Irish tribes, Gaelic ancestry, chieftains, political alliances, diplomacy, formal warfare or territorial states. Nor is there Irish evidence at this date for farming, herding, fields, houses, pottery, metalworking, monuments, graves or a trade system. Stone tools and ornaments from contemporary communities elsewhere in Europe provide useful context for the technological abilities of *Homo sapiens*, but they cannot be assigned to Ireland without Irish finds. It would be equally unwarranted to import the cave art, ritual customs or social arrangements of France, Iberia or central Europe into a Cork cave.

Conflict is similarly invisible. People and predators may have competed for carcasses and shelter, but no weapon assemblage, injury pattern or fortified place allows historians to describe organised violence on the island. Diplomacy, in any recognisable political sense, belongs to societies for which no evidence exists here. The decisive forces shaping life were environmental: cold, seasonality, scarce shelter, animal movement and the approaching expansion of ice.

Religion, Culture and Knowledge

No religious site, artistic image, musical instrument, personal ornament or burial can responsibly be dated to Ireland around 31,934 BCE. It follows that there is no direct Irish evidence for ceremony, belief, teaching or symbolic culture at this time. This silence should not be mistaken for proof that visitors, if present, had no beliefs or knowledge. Upper Palaeolithic peoples elsewhere possessed sophisticated skills in hunting, toolmaking, material working and environmental observation. They may have brought such capacities to Ireland, but the island's record has not preserved evidence that permits specific claims.

The real cultural achievement visible today is modern scientific recovery. Researchers combine zooarchaeology, microscopic analysis of bone surfaces, accelerator mass spectrometry, calibrated radiocarbon chronologies, sediment study and glacial geomorphology to extract evidence from very fragmentary remains. The history of Castlepook also demonstrates the value of museum collections: bones excavated generations ago can yield new questions and new results when examined with methods unavailable to their first collectors.

An Island in Transition

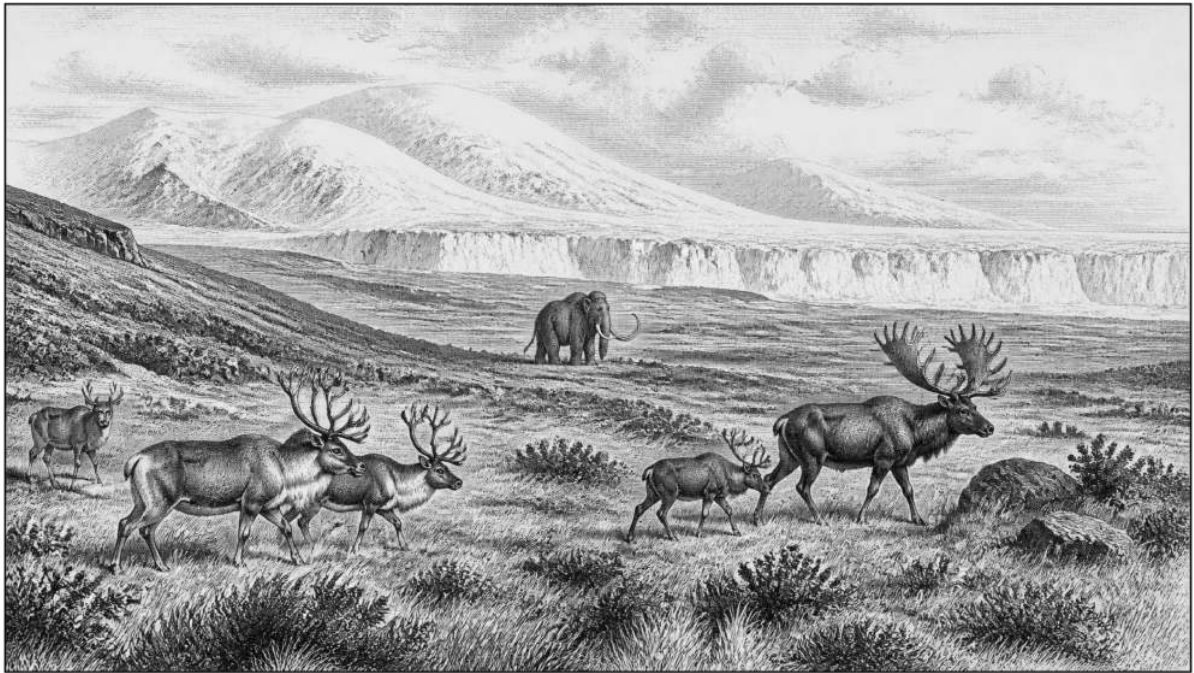
For Ireland, this was an era of possibility rather than continuity. Animal populations reached the island during milder phases, while the land was becoming increasingly exposed to the climatic deterioration that would produce the great ice-sheet expansion. Any human presence was, on present evidence, intermittent at most. The archaeological record does not allow a year-specific narrative, but it does reveal Ireland as part of the shifting ecological frontier of Ice Age Europe.

Thus 31,934 BCE should be remembered not for a named Irish event, but for the deep prehistory it represents: an Ireland of cold open ground, cave-dwelling carnivores and large herbivores; an island whose landscapes were about to be drastically reshaped by ice; and a period in which one disputed yet significant reindeer bone may preserve the faintest trace of human activity. Further secure excavation and direct dating may clarify the picture. Until then, restraint is not a gap in the history: it is the most accurate account of what the evidence can bear.

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31933 BCE

Ireland at the Ice Margin ^[68]



31,933 BCE is a modern calendar label, not a date at which archaeology can identify an Irish event. There were no written records, named communities, rulers or calendar systems on the island from which a precise “year” could be recovered. In scientific terms, the label falls roughly 33.9 thousand years before AD 1950, but even that conversion must not be mistaken for precision. Evidence from this depth of time is dated in broad calibrated ranges, often with sizeable uncertainties, and it usually records episodes rather than a single season or year.

The responsible picture is therefore one of late Pleistocene Ireland during Marine Isotope Stage 3, shortly before the fullest expansion of the last British–Irish Ice Sheet. It is a landscape known principally through cave bones, sediments beneath later glacial deposits, landforms, and measurements made on rocks and seabed sediments. These sources can illuminate climate, animals and changing ice cover. They cannot securely supply a political history, a chronology of conflict, or the daily experience of an identified human group in 31,933 BCE.

A Country Approaching Glaciation

Ireland was not simply a timeless white wilderness throughout the whole Ice Age. The climatic sequence was uneven, and the growth of the final great ice sheet was a process, not an instantaneous conquest of the island. Evidence from organic deposits sealed beneath till at Derryvree and Greenagho in County Fermanagh indicates that north-central Ireland had been ice-free until at least about 34,000 years ago. A synthesis of the evidence consequently places the principal build-up and expansion of the last Irish Ice Sheet between about 34,000 and 24,000 years ago. The numbered year in this article sits at or very close to the beginning of that long transition.

That chronology matters because it rules out two tempting but misleading certainties. It is not safe to picture every hill and valley in Ireland as already buried beneath the maximum ice sheet in 31,933 BCE; the best-dated maximum and shelf-edge advances came later, broadly between about 27,000 and 23,000 calibrated years ago in different sectors. Equally, it would be wrong to imagine a stable, hospitable island. Cooling conditions, accumulating snow and advancing ice were changing habitats and drainage over millennia. What was happening at one place could differ substantially from conditions in another.

At this stage, coastlines also differed from those familiar today. Large quantities of water were locked in global ice sheets, lowering sea levels and exposing parts of the continental shelves around north-west Europe. Yet a lower sea level does not automatically demonstrate an easy land bridge to Ireland at every point in the Ice Age. The routes available to animals or people depended on local sea depths, glaciers, sea ice, weather and changing shorelines. Any crossing would have been a formidable ecological and geographical matter, not a simple stroll across a modern map.

What the Caves Preserve

The most informative Irish archive for this broad period is Castlepook Cave near Doneraile, in north County Cork. Excavations and later study recovered more than 2,000 animal bones from deposits disturbed and accumulated over a very long span, with individual radiocarbon determinations ranging approximately from 45,700 to 19,950 years BP. This is not a neatly layered snapshot of one occupation. Water disturbance and the activity of carnivores have mixed and complicated the record. Nevertheless, it establishes that southern Ireland supported a striking assemblage of Ice Age mammals before the Last Glacial Maximum.

Its fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena; later material includes wolf, Arctic fox and lemmings. These remains are evidence for animal presence, not for all species living together at precisely the same moment. Nor does a bone in a cave necessarily prove that the animal died there: hyaenas could carry prey or carrion into dens, while water could move remains. But the assemblage demonstrates a wider food web than Ireland's later, post-glacial fauna. Plant-eating animals relied on open vegetation, while large predators and scavengers exploited the herbivores and their carcasses.

A historically supportable scene around this date is thus not one of forested Ireland. Before the eventual Last Glacial Maximum, colder, more open environments supported grazing animals in at least some regions. Mammoths ate grasses, herbs and other low vegetation; reindeer were adapted to cold, open country; and hyaenas, wolves and bears occupied different places in the predator and scavenger community. The precise pattern of plant cover around Castlepook in any individual century remains uncertain, however. The cave tells us much more securely which animals reached the region than exactly what a particular slope or river valley looked like in 31,933 BCE.

The Human Question

The possibility of people in Ireland at this early date requires particular care. A reindeer femur from the Castlepook collection has been reported as bearing deep marks consistent with butchery by a stone tool and as dating to around 33,000 years ago. If the marks are confirmed as human-made and securely associated with the bone's age, the find would be exceptionally important: it would suggest a brief Upper Palaeolithic human presence in Ireland more than 20,000 years earlier than the previously published Late Glacial evidence.

It does not, though, justify a settled population, a village, or an unbroken ancestry from Ice Age visitors to later Irish communities. No securely stratified stone-tool assemblage, hearth, dwelling, human burial or repeated camp of this age has yet established a permanent population. The National Museum of Ireland continues to describe clear Palaeolithic proof of humankind in Ireland as absent, while the best-published direct evidence for human activity is a brown-bear kneecap bearing fresh-bone cut marks from Alice and Gwendoline Cave, County Clare, dated to about 10,800–10,500 BCE.

The difference between those statements is not a contradiction to be smoothed away. It is the normal distinction between a promising reported find and a fully demonstrated archaeological record. Castlepook's reindeer bone makes the prospect of an earlier visit worthy of renewed excavation, microscopic analysis of marks, dating and publication. It cannot tell us that people were definitely present in the calendar year 31,933 BCE. If small groups did reach Ireland during the broader period, they would have been highly mobile foragers whose survival depended on detailed knowledge of seasonal animals, shelter, fuel and routes through a severe landscape. That is an inference from comparable Upper Palaeolithic societies elsewhere in Europe, not an observed Irish settlement.

Society Beyond the Evidence

For the same reason, no responsible account can identify Irish political affairs, diplomacy, warfare, laws, kin groups or leaders at this date. There is no evidence for states, territories or organised polities, and no basis for projecting later Gaelic traditions backwards over more than thirty millennia. Nor is there Irish evidence for formal religion, art, language, schooling or ceremonial monuments in this period. The famous monuments, metalwork and manuscript culture of later Ireland belong to vastly different worlds.

Even everyday life is demonstrably elusive. If humans entered the island, food procurement may have involved the hunting or scavenging of large mammals and the gathering of plant foods where conditions allowed, but Castlepook itself cannot specify techniques, household arrangements, clothing or social roles. Its cave assemblage is more immediately a record of animal ecology and bone accumulation than a domestic site. Trade, too, cannot be identified: no artefact distributions or imported materials demonstrate exchange networks connected to Ireland at this time.

What can be said is that the physical foundations of later regional landscapes were being prepared. Glacial erosion, deposition and meltwater processes associated with the last glaciation helped create or reshape valleys, basins, ridges and sediment blankets. Eskers, drumlin fields, corries and glacially scoured terrain visible in Ireland today are products of repeated ice-age processes, though most cannot be assigned specifically to this one year. The later retreat of ice would alter drainage, create lakes and expose fresh ground for plants, animals and ultimately people.

A Fragile Record

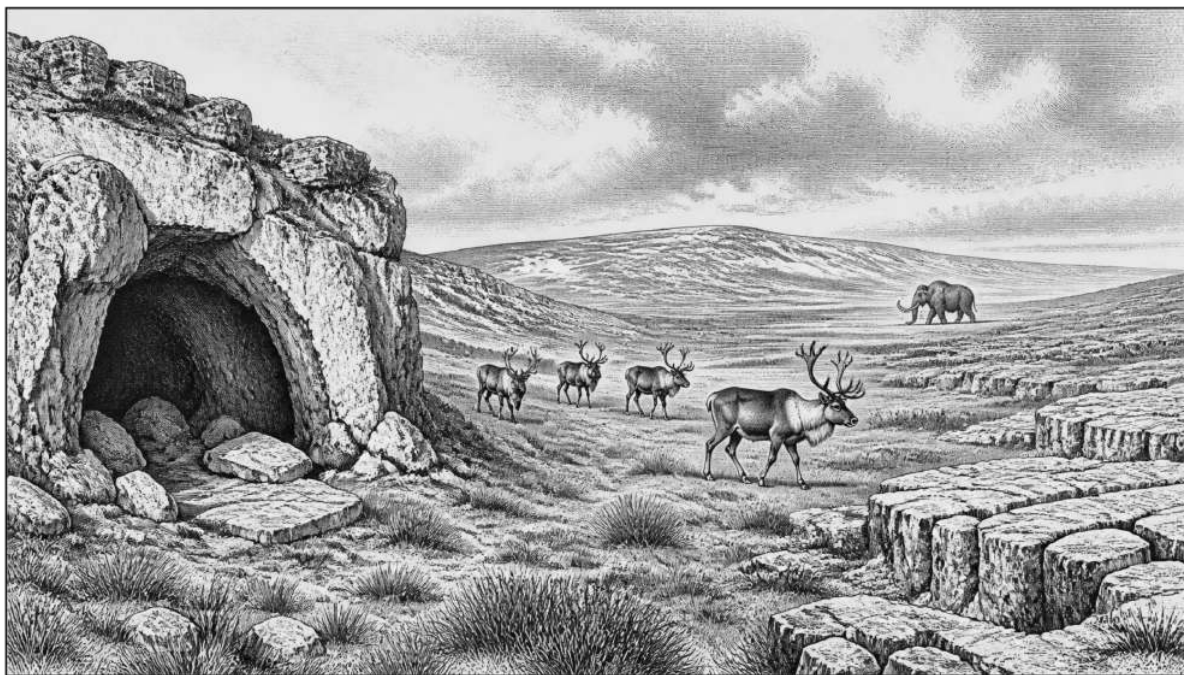
The central development around 31,933 BCE was therefore environmental rather than political: Ireland stood near the opening of the final expansion towards the Last Glacial Maximum. In parts of the island, large mammals had recently ranged through cold open country; in others, ice conditions may already have been strengthening. Cave deposits in Cork and buried sediments in Fermanagh preserve fragments of that changing world. They also show why certainty is difficult. Glaciers eroded older surfaces, acidic soils destroyed organic remains, and later water movement disturbed caves and shorelines.

Absence of evidence is not proof that no person ever crossed into Ireland during this period. But neither is an intriguing bone sufficient proof of a society. The historically sound conclusion is more restrained and more revealing: around the artificial date 31,933 BCE, Ireland was a climatically unstable, increasingly glaciated frontier within north-west Europe, inhabited securely by Ice Age animals and possibly visited by people. Its human history, if there was one then, survives only as a question at the edge of the archaeological record.

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31932 BCE

Cave Sediment Chronologies^[69]



“31,932 BCE” is a modern calendar label, not a date that can be matched to an Irish event. At this depth of time, modern calendar-year precision is unavailable. Archaeologists and Quaternary scientists instead work with radiocarbon determinations, calibrated probability ranges, cave sediments, fossil assemblages and ice-sheet reconstructions. Those records may resolve centuries or millennia, and their uncertainties are particularly important beyond 30,000 years ago. The responsible subject, therefore, is not what happened in Ireland in one named year, but what can be said about the island during the later Middle Palaeolithic climatic world, broadly around 34,000 calendar years before present.

That world preceded the fullest expansion of the Last Glacial Maximum, but it was already a severe and unstable phase of the last Ice Age. Ireland was entering a period in which the British–Irish Ice Sheet would grow dramatically. Reconstructions differ in local timing and extent because advancing ice erased, buried and reworked much of the earlier landscape. They nevertheless agree on the larger story: conditions were becoming colder, ice masses were expanding across the north-west European margin, and Ireland’s accessible environments were becoming more restricted.

Dating an Almost Invisible Past

The numbered year should not suggest false exactness. In archaeological convention, “before present” is measured from 1950, while BCE is a retrospective calendar system. A conversion from 31,932 BCE gives only an approximate position of about 33,900 years before present; it does not identify a single excavated deposit or a particular season. Radiocarbon ages are not calendar ages, and their calibration depends on a curve built from several natural archives, including tree rings, corals, lake sediments and cave deposits. At this antiquity, calibrated results can be broad and sometimes discontinuous.

The strongest evidence relevant to Ireland comes not from houses, tools in secure occupation layers or burials, but from animal remains, especially those recovered from limestone caves in the south and south-east. Such caves are unusually valuable because their sediments and fissures protected bone, even as later glaciers transformed much of the open landscape. Yet they also present problems. Many Irish cave collections were excavated in the nineteenth and early twentieth centuries, before modern stratigraphic recording. Bones from different periods could be disturbed, mixed or collected without the contextual information now expected. A radiocarbon date can establish the age of a bone, but not automatically explain how it reached a cave, whether people handled it, or whether other objects found nearby were contemporary.

Castlepook and the Ice-Age Fauna

Castlepook Cave near Doneraile, County Cork, is central to this distant chapter of Irish history. Its old collections contain remains of an impressive Pleistocene fauna: woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Revised dating has demonstrated that parts of this assemblage are much older than earlier estimates had indicated. The site consequently shows that Ireland supported, or was visited by, a varied cold-stage mammal community well before the maximum glaciation.

These animals should not be imagined as all living together at one instant. A cave can accumulate bones across thousands of years, while changing climate alters which species can survive or pass through a region. Nor does the fossil list produce a complete reconstruction of the landscape. It does, however, support a broad image of open, cold environments capable of sustaining large grazers and browsers, their predators and small mammals adapted to harsh conditions. Mammoth and reindeer imply substantial forage over open ground; lemmings and Arctic fox point towards conditions far removed from modern Ireland's mild, wooded setting. Hyenas, meanwhile, were both predators and scavengers, and may themselves have carried carcass parts into caves.

The mammoth and hyaena evidence also corrects a familiar but misleading image of an Ireland wholly sealed beneath ice throughout the entire Ice Age. Glaciation was not a single unchanging blanket. Over tens of millennia, ice expanded and contracted, and animal communities entered, disappeared and reappeared as routes and habitats changed. Around the date represented here, the best conclusion is that at least some Irish landscapes still offered terrestrial habitat, although colder conditions and advancing ice were reducing the resilience of those environments.

Were People Present?

Human presence is the most consequential question, and the answer remains cautious. A reindeer bone from Castlepook has been reported as bearing marks consistent with chopping by a stone tool and as dating to roughly 33,000 years ago. If the marks are confirmed as human-made and securely connected to the age of the bone, the specimen would indicate a remarkably early Palaeolithic human visit to Ireland, many millennia before the traditionally recognised post-glacial settlement.

That possibility must not be promoted into certainty. The bone comes from an old cave collection rather than an undisturbed, excavated living floor, and the proposed interpretation requires further detailed publication, renewed excavation and comparison with marks made by carnivores, sediment abrasion and other natural processes. Current research at Castlepook is seeking precisely the sort of securely stratified deposits that could test these questions. A responsibly written account of 31,932 BCE can therefore say

that Ireland has tantalising evidence potentially relevant to human activity in the pre-Last Glacial Maximum period; it cannot claim a documented community, named settlers, a camp, or an uninterrupted occupation of the island.

This distinction matters because the clearer evidence for people in Ireland is vastly later. The National Museum of Ireland still describes the Palaeolithic human record as lacking unequivocal proof, while research on the Castlepook material has opened an important debate. At Alice and Gwendoline Cave in County Clare, a butchered brown-bear bone is evidence for a much later terminal-Pleistocene human episode, around 12,800–12,600 calibrated years before present. It demonstrates that careful re-examination of cave collections can transform the evidence, but it cannot be projected backwards to prove settlement at the much earlier date considered here.

Society Without a Settlement Record

No political history can be recovered for Ireland around 31,932 BCE. There are no rulers, territories, diplomatic encounters, monuments or written traditions. There is likewise no Irish evidence for warfare, organised religion, artistic practice, formal learning, trade networks, domestic architecture or a settled economy at this date. To write of tribes, chiefs, shamans or migrations would be invention rather than history.

At most, the Castlepook reindeer bone, if eventually accepted as modified by people, would suggest a practical encounter between hunters or scavengers and an animal carcass. Cutting a large limb bone could relate to the removal of meat, tendons, marrow or hide. But even that interpretation does not reveal the size, language, ancestry, social structure or duration of any human group. The cave itself may have been a carnivore den, a natural trap, a place of occasional animal death, a repository reached through water and slope movement, or some combination of these. It is not presently a demonstrated human home.

Nearby parts of western Europe certainly preserve Upper Palaeolithic hunter-gatherer societies with sophisticated stone technologies, mobile lifeways and, in some regions, cave art and personal ornament. That wider European record makes a brief Irish incursion conceivable. It does not license the transfer of every continental practice to Ireland. The Irish evidence must retain its own scale: an island with rich but fragmentary faunal archives and only a possible human signal.

An Island in Environmental Change

Geography was also in motion. Global sea level during glacial phases was lower than today because water was stored in continental ice sheets, exposing areas of the present continental shelf. But the arrangement of coasts, shallow seas, ice and land routes around Ireland changed repeatedly. Later research indicates that Ireland became separated from Britain relatively early during deglaciation; that later conclusion cannot simply be used to draw a reliable route for 31,932 BCE. At this earlier point, travel would have depended on a changing and hazardous north-west European landscape, not on the familiar modern coastline.

As ice advanced, it did more than chill the climate. Glaciers altered drainage, stripped soils, reshaped valleys and reworked older deposits. This helps explain why evidence of people, plants and ordinary activity is so scarce. Absence of a site is not always evidence that nobody came; in Ireland it can also reflect the destructive force of later ice and the survival bias of caves. Conversely, a single bone survives because of exceptional circumstances and cannot bear the weight of an entire national narrative.

What This Year Can Mean

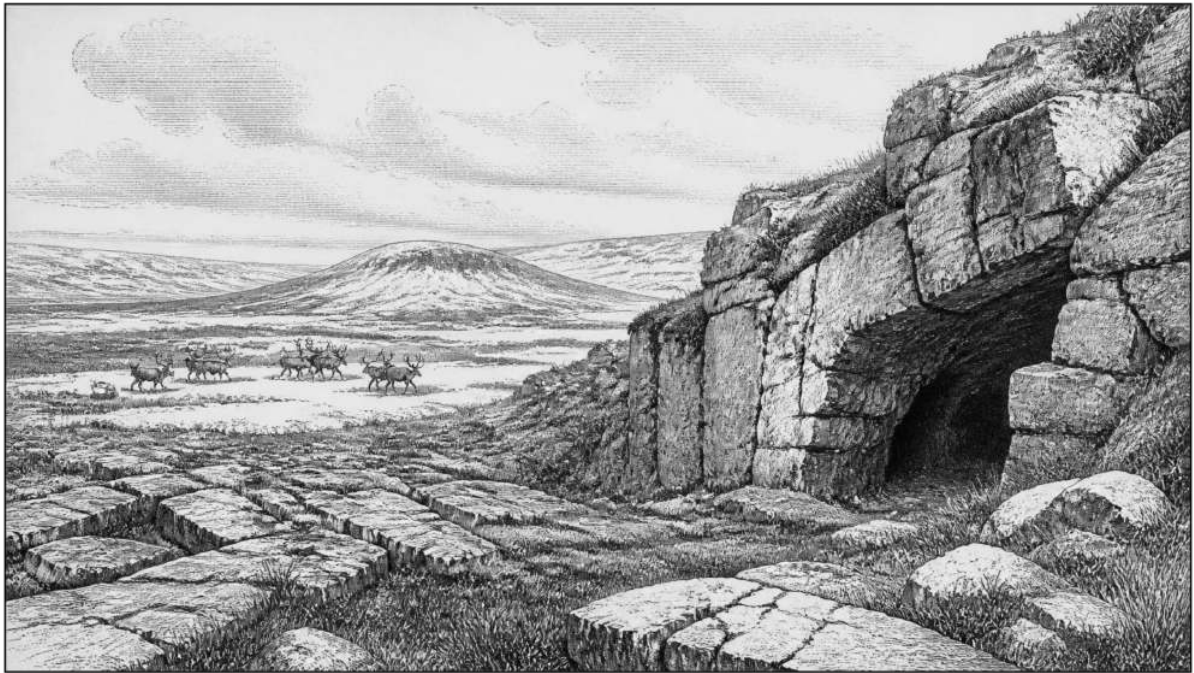
Ireland around 31,932 BCE belongs to an archaeological threshold: a cold, changing pre-maximum glacial landscape, known principally through cave fauna and ice-sheet science. Castlepook Cave offers the most vivid Irish evidence, preserving traces of animals that included reindeer, mammoth, giant deer, bear and hyaena. It may also preserve a clue to a human visit, but not yet proof of permanent settlement or a fully described Palaeolithic society.

The important development is therefore evidential as much as historical. Re-dating old collections, applying improved bone pretreatment, calibrating radiocarbon results and reopening caves with modern methods have made Ireland's deep past more complex. Rather than an empty prelude before post-glacial colonisation, the island appears as a difficult, intermittently habitable part of Ice-Age north-west Europe. The record is still too thin to narrate a year. It is rich enough, however, to show why the question remains open.

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31931 BCE

Early Animal Butchery^[70]



The label 31,931 BCE is a modern way of indexing deep time, not a year that people in Ireland could have named or recorded. No calendar, writing system, ruler or dated event is available for this part of the Ice Age. By simple calendar arithmetic it lies roughly 33,880 years before 1950, the conventional reference point for “before present”, but that is not the same thing as a calibrated scientific date. Archaeologists and Quaternary scientists work instead with radiocarbon determinations, calibrated ranges, sediment sequences and ice-sheet chronologies, each carrying margins of uncertainty. The responsible history of Ireland at this point is therefore a history of landscape, animals and an exceptionally slight possible human trace.

A Late Pleistocene Landscape

This notional year falls in the Late Pleistocene, within Marine Isotope Stage 3: a cold, climatically unstable phase of the last Ice Age. It preceded the fullest expansion of the last British–Irish Ice Sheet. Current syntheses place the period when ice entirely covered Ireland and extended towards the Atlantic and Celtic Sea shelf edges broadly around 27,000–23,000 calibrated years before present, although the growth and maximum extent of different sectors were not simultaneous. The island at 31,931 BCE was therefore approaching, rather than securely within, that later maximum.

That distinction matters. It is misleading to imagine a single, unchanging white cap over the whole island throughout the Ice Age. Ice expanded and contracted, while local conditions differed between uplands, lowlands, coasts and the Irish Sea basin. Reconstructions for the British–Irish Ice Sheet show repeated advances, changes in flow direction and rapid responses to climate. At approximately 34,000

years before present, the exact outline, thickness and permanence of ice over every part of Ireland remain uncertain. The evidence supports a cold, severe and changing environment; it does not support a map precise enough to identify the weather or terrain of one calendar year.

Nor should this Ireland be called an “Emerald Isle”. During cold intervals, woodland would have been greatly restricted or absent across broad areas. Open herb-rich grassland, tundra-like vegetation, bare mineral ground and patches of snow or glacier ice are more appropriate possibilities, varying with local exposure and season. The sea was also lower than today because immense quantities of water were stored in northern ice sheets. Yet lower sea level did not automatically make Ireland a landward extension of Britain or continental Europe. The Irish Sea basin, changing ice margins and marine barriers made access difficult and variable.

Animals Before the Deep Freeze

Irish caves and museum collections provide the most tangible evidence for this older world. The Irish Quaternary Fauna Project concluded that a wide range of mammals reached Ireland between at least about 45,000 and 20,000 years ago, though the fossil record is uneven and individual species did not necessarily live together at the same moment. Castlepook Cave near Doneraile, County Cork, is especially important. Its old collections include remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemming and spotted hyaena, among other Ice Age fauna.

These animals are evidence of ecological possibilities, not a complete census for 31,931 BCE. A mammoth bone dated to around 35,000 years ago and other dated faunal material demonstrate that large grazing animals and their predators had reached Ireland during the broader pre-maximum cold-phase world. Reindeer are particularly relevant to the period, because their movements across open landscapes could have drawn mobile predators and human hunters alike. Spotted hyaena remains, also known from Castlepook, remind us that caves were often carnivore dens and bone accumulators, not simply shelters used by people.

The traditional name “Irish elk” can also mislead. *Megaloceros giganteus*, or giant deer, was neither confined to Ireland nor closely related to the living elk or moose. Its famous Irish fossil record reflects preservation and collecting history as much as national uniqueness. In this earlier phase, animal bones must be understood through taphonomy: scavenging, carnivore transport, water movement, collapse, excavation and curation can all alter what survives and where it is found.

A Possible Human Footprint

The closest potentially human evidence for this article’s date comes from Castlepook. A reindeer femur from the cave has been reported by its researcher, Ruth Carden, and in Cork heritage publications as bearing a mark consistent with cutting fresh bone using a sharp stone tool. The bone has been presented as dating to about 31,000 BCE. If the mark is correctly identified as a butchery cut and is contemporary with the animal’s death, it would indicate that Upper Palaeolithic people reached Ireland far earlier than the long-accepted late-glacial evidence from County Clare.

This is important, but its limits are just as important. The reported object is not a settlement, a hearth, a stone-tool assemblage, a grave, a house floor or a human skeleton. It cannot establish the number, language, ancestry, gender, social organisation or duration of any visitors. Nor does one modified bone prove a continuously occupied Ireland. The old cave deposits were excavated in the early twentieth

century, before modern recording standards, and their original contexts are difficult to reconstruct. Recent licensed investigation at Castlepook is valuable precisely because it seeks intact deposits, improved dating and a better understanding of how the cave assemblage formed.

The evidence therefore permits a cautious interpretation: small groups of hunter-gatherers may have made a short incursion into Ireland during a milder or more accessible phase of the late Ice Age, perhaps following or exploiting reindeer. It does not yet demonstrate a permanent population. In wider north-west Europe, Upper Palaeolithic groups had sophisticated stone technologies, extensive social contacts and, in some regions, cave and portable art. Those facts supply context for what visitors to Ireland might have known; they are not evidence that comparable tools, artwork or practices have been found in Ireland at this date.

No Politics, No Proven Communities

There is no basis for political history in the ordinary sense. Ireland at 31,931 BCE had no known kingdoms, chiefs, tribal names, borders, laws, diplomacy or warfare. It is equally impossible to identify an Irish people, an Irish language or an Irish religious tradition. Such terms belong to vastly later periods. The most that can responsibly be said of society and everyday life is conditional: if people were present, they were almost certainly mobile hunter-gatherers whose survival depended on ecological knowledge, cooperation, clothing, fire, portable equipment and seasonal movement. None of those necessities can be demonstrated directly from an Irish domestic site of this age.

There is likewise no Irish evidence for farming, herding, fields, monuments, formal burial rites, long-distance commerce or organised trade at this point. A hunter's movement over water or ice-fringed routes would not itself constitute trade. The economic reality visible in the evidence is ecological rather than commercial: animal populations exploited open environments, carnivores contested carcasses and sheltered caves accumulated remains. Any human economy, if represented by the Castlepook bone, was a moment of acquisition and butchery, not a documented system of production.

What the Record Can Preserve

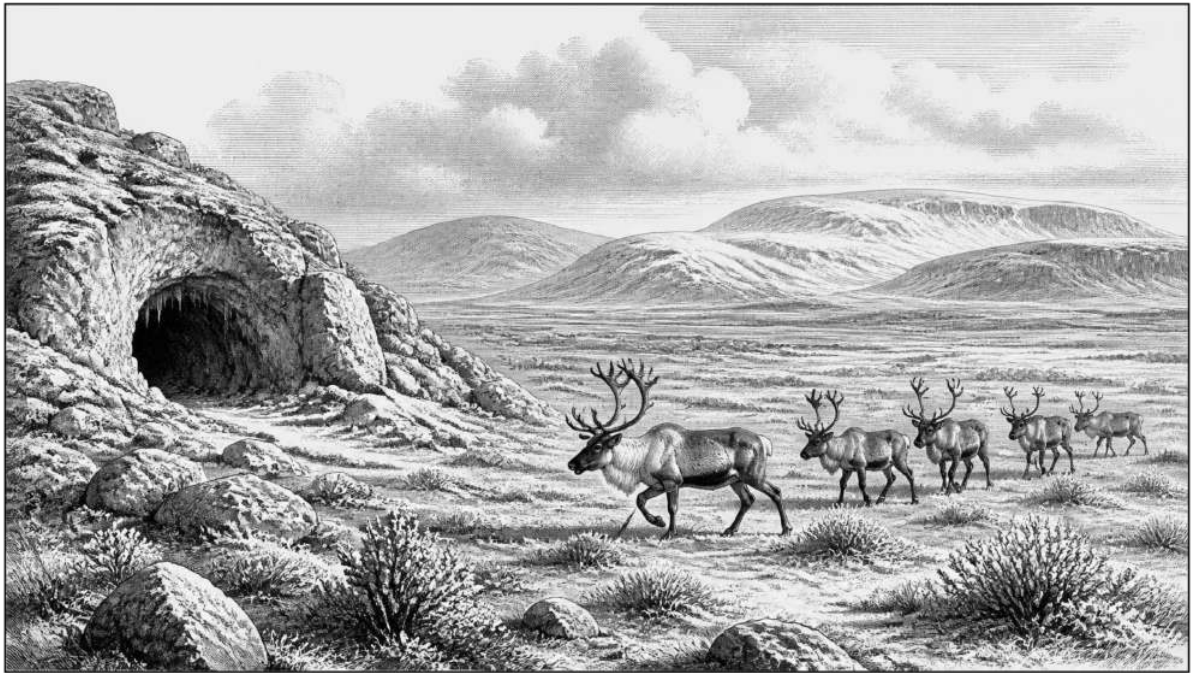
Glaciation helps explain why the record is so thin. Later ice eroded, transported and buried sediments across much of Ireland, while rising seas reshaped or drowned former coastal landscapes. Sites that might once have existed in lowland valleys, on coasts or beside former lakes could have been destroyed, concealed beneath drift, or submerged on the continental shelf. Caves, fissures and museum archives have consequently become disproportionately important windows onto the Pleistocene.

Absence of evidence is not proof that no person ever set foot on the island before the final ice advance. But neither can missing sites be converted into an imagined lost society. The sound conclusion for 31,931 BCE is narrower and more compelling: Ireland was part of a volatile north-west European Ice Age world inhabited by large mammals and predators, with ice-sheet growth increasingly transforming the terrain. At Castlepook, one reindeer bone offers a carefully qualified possibility of human butchery. Future excavation, dating and microscopic analysis may strengthen, revise or reject that interpretation. For now, the year belongs less to recorded human history than to the difficult archaeology of a landscape on the verge of profound glacial change.

Chapter 071 of 100

31930 BCE

Castlepook's Ambiguous Toolmark^[71]



“31,930 BCE” is a modern chronological label, not a date that can be recovered from the Irish archaeological record with calendar-year accuracy. No written source, settlement sequence or securely dated event allows historians to say what happened in Ireland in that particular year. At this depth of time, the responsible language is one of broad, calibrated ranges and probabilities. The chosen point falls in the later part of Marine Isotope Stage 3, a fluctuating cold phase of the Late Pleistocene, tens of millennia before the Last Glacial Maximum. It is best approached as a window onto an Ice Age Ireland whose evidence is sparse, uneven and often preserved in caves rather than in recognisable habitation sites.

A Landscape Before Maximum Glaciation

Ireland was not then the green, wooded island familiar today. Climate shifted sharply during the Late Pleistocene, and local conditions altered as ice expanded and contracted across the wider British-Irish region. The great maximum of the last British-Irish Ice Sheet came later, broadly during the period c. 26,000–19,000 calibrated years before present. At the notional date used here, extensive ice was approaching rather than simply forming a fixed, island-wide backdrop. The exact pattern of glacier cover, exposed land and habitable ground remains debated because the later ice sheet eroded, transported and buried much of the earlier evidence.

That uncertainty matters. It is misleading to picture every part of Ireland as permanently sealed beneath ice at one moment, but equally misleading to imagine a hospitable, settled country. Southern cave faunas demonstrate that mammals entered parts of Ireland during Marine Isotope Stage 3, while geomorphological and offshore studies show that the ice sheet later became extensive and dynamic. Low

sea levels altered the outlines of the coast and exposed large areas now beneath the Atlantic and Irish Sea. Ireland nevertheless remained separated from Britain by water during the Pleistocene; any human arrival would have required a sea crossing, however narrow, shallow or seasonal that crossing may have been.

Castlepook Cave and a Difficult Clue

The most important evidence relevant to this horizon comes from Castlepook Cave, near Doneraile in north County Cork. Excavations there between 1904 and 1913 produced a very large collection of animal bone from a complex limestone cave system. Much was recovered before modern excavation standards, and only a fraction of the original collection survives. The deposits are therefore invaluable but difficult: bones came from different galleries, layers and episodes, and the cave was used or entered by animals over a long period. A fossil from Castlepook can illuminate Ice Age Ireland without necessarily proving that all the creatures represented lived together, or that an event occurred at the same time as another bone from the site.

Modern radiocarbon work has revised the chronology of several southern Irish cave collections. It indicates that a varied mammal fauna reached Ireland between at least about 45,000 and 20,000 years ago, with Castlepook preserving important evidence from before the Last Glacial Maximum. Reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings, spotted hyaena and woolly mammoth are among the animals identified from the cave assemblage. These remains are direct evidence that Ireland, or at least accessible parts of its southern landscape, could sustain changing cold-stage faunas. They support an interpretation of open, treeless environments with grassland, herb-rich tundra or steppe-tundra characteristics, rather than a forested landscape. They do not provide a complete snapshot of one season or one year.

A reindeer femur from the Castlepook collection has particular significance because its surface marks have been interpreted as cuts made by a sharp stone tool during carcass processing. Public presentations of the find have described its age as roughly 33,000 years ago or c. 31,000 BCE. That reported estimate helps explain why this remote date is historically interesting, but it must not be converted into a precise event in 31,930 BCE. Radiocarbon determinations require calibration to calendar-age ranges; at such antiquity those ranges are substantial. More importantly, the specimen derives from an old collection rather than a newly excavated, securely stratified activity surface.

Evidence, Interpretation and Human Presence

If the mark is correctly identified as human butchery and belongs to the animal's original processing, it would provide striking evidence for a fleeting Upper Palaeolithic human presence in Ireland far earlier than the better-known late-glacial evidence from County Clare. Reindeer would have offered meat, marrow, fat, hide, sinew, antler and bone: a single processed limb bone is entirely compatible with mobile hunters making use of a carcass. But it cannot establish whether people killed the animal, scavenged it, processed it elsewhere or entered the cave at all. Carnivores may have carried discarded remains into the cave, and spotted hyaenas are especially relevant to understanding how its bone accumulations formed.

The cautious conclusion is therefore narrower than popular claims of a "first settlement". Castlepook may indicate a short human incursion or visit by one or more highly mobile hunting parties, perhaps following resources within the wider north-west European world. It does not demonstrate a permanent Irish population. No securely associated stone-tool assemblage, hearth, dwelling floor, burial, art, human bone or repeated occupation layer has yet established a community in Ireland at this date. The National

Museum of Ireland still rightly stresses the absence of clear Palaeolithic evidence in the conventional archaeological sense. The Castlepook bone is a provocative and potentially transformative clue, not a licence to fill the island with imagined camps.

No Politics, No Recorded Wars

There were no known kingdoms, chiefs, tribal names, laws, diplomatic contacts or political institutions in Ireland in 31,930 BCE. Nor is there evidence for warfare in the historical sense. The most consequential struggles visible in the record were ecological: animals and any occasional people negotiating cold, hunger, predators, shifting vegetation and changing coastlines. Reindeer and giant deer were potential prey; hyaenas, wolves and bears were competitors or dangers. To call a possible visiting group “Irish”, however, would impose later ethnic and national ideas on people whose language, identity, kinship, numbers and origins are wholly unknown.

Neither can religion, formal learning or artistic culture be responsibly reconstructed for Ireland itself. Upper Palaeolithic communities elsewhere in Europe made sophisticated stone and bone tools, ornaments, images and burial places. Those achievements show what some contemporary *Homo sapiens* societies were capable of, but they are comparative context, not Irish evidence. Nothing from Castlepook proves cave art, ritual, seasonal ceremony or a specific technological tradition on the island. The absence of evidence may partly reflect later glacial destruction, submerged former landscapes and the limited investigation of old cave collections, but it remains an absence that interpretation must respect.

Economy Without Settlement

There is no basis for describing agriculture, herding, markets, trade routes or craft production in Ireland at this time. If humans reached the island, their economy would have been based on foraging, hunting and opportunistic use of animal materials, not farming. A reindeer-processing mark, if accepted, would be evidence of subsistence activity rather than exchange. It would also underline Ireland’s position within a changing ecological zone: animals evidently reached it from the larger European landmass, while people may have had the capacity to cross the intervening water when circumstances allowed. The route, craft and frequency of such crossings remain unknown.

Permanent settlement is unproven. There are no houses, middens, storage pits or field systems attributable to this period in Ireland. Caves should not automatically be called homes; Castlepook’s evidence is primarily faunal, and its geology and carnivore activity complicate every inference. Even a successful human visit need not have lasted more than hours, days or a season. Later Irish prehistory is rich in houses, tombs, tools and monuments, but this far earlier landscape is known chiefly through bone, cave sediment, glacial landforms and scientific dating.

What This Date Can Mean

The real importance of this period is not an invented incident on a precise day, but the possibility that the human history of Ireland has a deeper and more intermittent beginning than once thought. Castlepook Cave shows that Ice Age animals occupied southern Ireland during a climatically unstable period before the ice sheet’s greatest expansion. The reported cut-marked reindeer bone may eventually show that humans accompanied that fauna, at least briefly. Further re-excavation, improved dating, microscopic study of surface modification and discovery of securely associated tools are needed before that possibility

becomes a firmer history. For now, Ireland around 31,930 BCE is best understood as an exposed, cold and changing edge of north-west Europe: inhabited certainly by animals, and perhaps touched by people, but not yet demonstrably settled by them.

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31929 BCE

Derryvree Organic Silts^[72]



31,929 BCE is not a date that can be recovered as a single year of Irish history. It is a modern BCE label projected far back into the Late Pleistocene, long before writing, calendars, kingdoms or named peoples in Ireland. In archaeological terms it corresponds only approximately to c. 33.9 thousand calendar years before present (cal BP, where “present” is AD 1950). At this depth of time, radiocarbon ages must be calibrated and carry ranges rather than year-by-year certainty. The responsible subject is therefore not an event on a particular day or in a particular year, but Ireland during Marine Isotope Stage 3: a severe, unstable phase of the last glacial cycle, preceding the conventional Last Glacial Maximum.

A Fragmentary Ice-Age Ireland

The Ireland of this broad period was not yet the island familiar today. Its coastlines, sea levels, river valleys and connections with the surrounding continental shelf were all affected by the growth and decay of ice. Yet it would be misleading to picture a single, fixed scene. Geological evidence shows that ice margins and relative sea level changed repeatedly through the later Pleistocene. Research on western Ireland records high relative sea levels between about 40,000 and 19,000 cal BP, interpreted as evidence of substantial loading of the land by ice, while other deposits indicate rapid fluctuations of the ice margin. The point conventionally labelled 31,929 BCE falls within this changing world, not at a securely charted boundary between “ice-free” and “ice-covered” Ireland.

The term *Last Glacial Maximum* should also be used carefully. It normally refers to the interval of greatest global ice extent, broadly c. 26,000–19,000 years ago, and much of the firm evidence for an extensive Irish Ice Sheet belongs to that later interval. At c. 33.9 ka cal BP, Ireland was in the preceding part of the last glacial stage, when climate was cold but variable and the British–Irish Ice Sheet was

developing in complex pulses. Later ice movement was powerful enough to erode, bury and redeposit older landscapes. That destructive history explains why the evidence for this earlier period is exceptionally sparse and why reconstructions differ over the size, thickness and timing of the Irish ice mass.

What the Deposits Can Say

The most useful evidence close to this date is geological and palaeoenvironmental rather than archaeological. At Derryvree in County Fermanagh, organic-rich silts occur between glacial deposits. Their radiocarbon evidence has been calibrated to a broad interval of roughly 36.9–31.7 thousand calendar years ago. Such a sequence is important because organic sediment could only accumulate during a period when the immediate locality was not overridden by active glacier ice. Pollen and sediment evidence have been interpreted as indicating a cold, treeless environment with wet ground or muskeg-like vegetation. The deposit does not offer a snapshot of 31,929 BCE, but it securely shows that parts of north-western Ireland experienced ice-free or less intensely glaciated conditions at some point within a time range that includes it.

That distinction matters. Sediments can document an environment; they cannot reveal a village, a tribe, a ruler or a political frontier. Nor should conditions at Derryvree be extended automatically to every Irish region. Mountainous western, southern and eastern areas preserve different signs of ice action, including trimlines, moraines, ice-scoured bedrock and blockfields. Cosmogenic exposure dating and stratigraphic work have transformed knowledge of the later ice sheet, but they also underline the unevenness of the record. Some high ground may have stood above erosive warm-based ice, or beneath cold-based ice that caused relatively little erosion; other areas were profoundly reshaped. These are interpretations drawn from landforms and dates, not a precise map for one BCE year.

Animals Before Maximum Glaciation

Irish cave deposits offer a second, equally qualified window. Castlepook Cave in County Cork has produced remains associated with Late Pleistocene cold-stage fauna, including mammoth, reindeer, giant deer, wolf, fox, Arctic fox, bear and spotted hyaena. Modern re-dating has revised the chronology of parts of this assemblage, with important samples proving older than earlier measurements suggested; scholarship now warns against treating all material from the cave as one brief, neatly dated episode. The responsible conclusion is nevertheless striking: during portions of Marine Isotope Stage 3, Ireland supported, or at least received, a varied large-mammal fauna characteristic of cold northern European environments.

It cannot be claimed that every one of those animals was alive in Ireland in 31,929 BCE. A cave assemblage accumulates over time, may contain material disturbed by natural processes or earlier excavations, and commonly has dates with wide uncertainties. Mammoth and hyaena are especially evocative, but they should not become decorative certainties in a reconstruction of this particular date. The better historical image is of ecological possibility: open, cold landscapes could sustain grazing and browsing animals, while carnivores and scavengers followed such resources. The changing availability of vegetation, shelter, snow-free ground and routes across exposed shelf landscapes would have governed animal movement more than any stable geographical boundary.

No Demonstrable Human History

There is no securely dated Irish settlement, tool-making site, burial, dwelling, hearth or human skeleton that can be assigned to c. 33.9 ka cal BP. Therefore there is no evidence from which to write of political affairs, warfare, diplomacy, religious practice, language, artistic traditions, learning, exchange systems or an Irish economy at this time. Modern humans elsewhere in Europe were makers of Upper Palaeolithic technologies and participants in rich cultural worlds, but that wider European fact must not be converted into an assertion of an Irish community. An artefact's presence, repeated tool finds in sealed deposits, or securely human-modified bone would be needed before such a claim could be responsibly made.

Later evidence must remain later evidence. The well-known butchered bear bone from Alice and Gwendoline Cave in County Clare is dated to the terminal Pleistocene, around 12,500 cal BP, more than twenty millennia after the period considered here. It is highly important for the story of the first known human presence in Ireland, but it cannot fill the much earlier gap. Likewise, the substantial Mesolithic record belongs after the final retreat of ice and the reorganisation of Irish environments. These discoveries show why archaeological absence should never be confused with proof that no person ever visited; they do not provide evidence for people in Ireland at 31,929 BCE.

Settlement, Movement and Loss

The absence of a contemporary human record has several possible explanations. Ireland's later ice sheets eroded bedrock, transported sediment and destroyed or deeply buried former ground surfaces. Acidic soils and the scarcity of protected caves further reduce the survival of bone, wood, fibres and other organic traces. Coastal evidence is especially vulnerable because glacial-period shorelines now lie beneath the sea or have been altered by subsequent sea-level change. It is possible that transient visitors, animal-following groups or short-lived camps left traces that have not survived or not yet been found. Possibility, however, is not evidence; the archaeological record presently supports no claim of habitation, commerce or organised travel.

For the same reason, neither conflict nor diplomacy can be detected. There were no states, written agreements, known territories or recoverable leaders. If people had reached the region, their social arrangements would remain unknowable from the Irish evidence presently available. The central historical development was environmental: the advance towards the fuller glaciation that would later transform almost the whole country and extend ice onto the continental shelf. Offshore cores, terrestrial sediments, moraine systems and exposure dates allow scientists to reconstruct parts of that process, while also showing that the ice sheet was dynamic rather than a static white cover.

An Ireland Known Indirectly

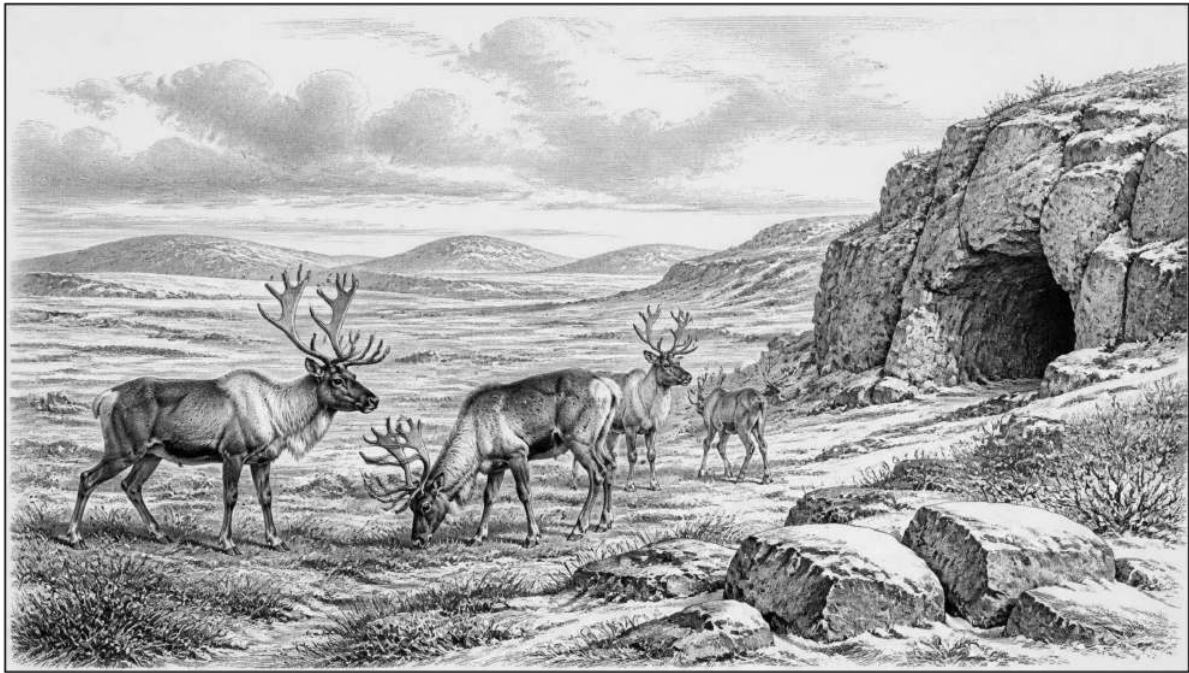
Thus the historical significance of this date lies in restraint. Around the point represented by 31,929 BCE, Ireland can be placed within a cold and fluctuating Late Pleistocene world; local organic deposits indicate intervals without active ice cover, cave faunas demonstrate the presence of cold-stage mammals during the broader period, and geological records chart the approach of major glaciation. Beyond this, certainty fades. There were no Irish polities to describe and no verified inhabitants to name. What

survives is a landscape archive: silts, pollen, bones, shells, erratics, moraines and scarred rock. It is incomplete, but it preserves the beginning of the long environmental story from which the later human history of Ireland eventually emerged.

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31928 BCE

Midlandian Glacial Stage^[73]



“31,928 BCE” is a modern chronological label, not a year for which Ireland has an event record. It falls roughly 33,900 calendar years before AD 1950, the conventional reference point for radiocarbon dating, in the Late Pleistocene and towards the close of Marine Isotope Stage 3. No written evidence, named individuals, communities, political boundaries or annual calendar survives from this depth of time. Even the natural record is dated in wide ranges, not individual years. The responsible history of Ireland at this point is therefore an account of changing climate, animal life, landscapes and the extremely limited possibility of human visits—not a reconstruction of a particular winter, hunt or settlement.

At this date, Ireland was in the Midlandian glacial stage, the last major Ice Age of the island. It was not yet at the Last Glacial Maximum, when the British–Irish Ice Sheet attained its widest extent around 27,000–23,000 years before present and later covered almost all of Ireland. Around 33,900 years ago, however, the climate was already cold and unstable, and ice was becoming an increasingly important force in the region. Reconstructions differ over precisely when individual Irish uplands, coasts and basins first became glaciated. That uncertainty matters: no credible study can draw an exact ice margin across Ireland for 31,928 BCE. Broadly, the evidence suggests a pre-maximum landscape in which substantial ice-free ground still existed, particularly at lower elevations and in the south, while glaciers and ice-sheet growth were beginning to transform the country.

A Landscape Before Maximum Glaciation

The familiar green, wooded Ireland of later millennia did not exist. Cold-stage conditions supported largely open vegetation: grasses, sedges, herbs and low shrubs rather than dense forest. The terrain would have varied sharply with altitude, exposure, soils and proximity to ice. Frost fractured rock, seasonal thaw

moved sediment downslope, and sparse plant cover left ground vulnerable to wind and water erosion. Rivers behaved differently from their modern descendants, carrying greater loads of glacial or periglacial sediment. In limestone districts, caves and fissures offered sheltered traps in which bones, sediments and occasional traces of activity could accumulate.

Sea level was far lower than it is today because so much water was stored in northern ice sheets. The outlines of the Irish Sea basin and adjacent shelves were consequently very different. Yet lower seas do not automatically mean that people or animals could simply walk to Ireland. The exact arrangement of land, shallow water, sea ice and ice-sheet margins changed through time and remains debated. The island's position on Europe's north-western edge was a serious ecological barrier, especially as climate worsened. Its later archaeological record shows how consequential that barrier could be: sustained human settlement is not securely visible until the Mesolithic, many tens of millennia after the period considered here.

The evidence for this older environment is fragmentary because the later expansion of ice was destructive. Moving ice eroded bedrock and sediment, reworked deposits and removed many exposed traces that might once have existed. Coastal change has also submerged or destroyed former shorelines. Caves are therefore disproportionately important. They are not neat time capsules: carnivores drag in prey, water shifts bones, animals die naturally in shelter, and nineteenth- and early twentieth-century excavators often removed material before modern recording methods existed. Nonetheless, caves preserve some of the strongest evidence for the kinds of animals that reached Ice Age Ireland.

Castlepook Cave and Its Fauna

Castlepook Cave near Doneraile in north County Cork is central to understanding Ireland in the long interval around this date. Excavated principally by Richard J. Ussher in the early twentieth century and investigated again with modern methods, it has produced one of the island's richest Pleistocene faunal assemblages. Its dated and identified remains show that, at different points before the Last Glacial Maximum, southern Ireland supported or received an imposing cold-climate fauna. Mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena are among the animals represented in the wider Castlepook record.

This list must not be turned into a literal roll-call for one day in 31,928 BCE. Individual bones have different dates, and old cave deposits can mix material from separate episodes. Some early radiocarbon results have also been revised after advances in collagen preparation and measurement. Modern re-dating has shown that certain Castlepook specimens are substantially older than once thought, reinforcing the importance of Marine Isotope Stage 3 fauna but also warning against easy chronological assumptions. What the assemblage securely establishes is a broad ecological fact: Ice Age Ireland was not an empty ice desert throughout the whole period before maximum glaciation. It contained, or was intermittently reached by, large grazers and their predators.

Reindeer are especially relevant. Their presence implies open, cold-adapted grazing country, though it does not tell us the size, seasonality or permanence of herds. Mammoth and giant deer likewise point to landscapes capable of supporting large herbivores, while hyaena, wolf and bear show that Ireland's food webs included major scavengers and predators. A cave with hyaena remains need not have been a human shelter at all: carnivores themselves may have made it a den, feeding place or accidental bone repository. The animal evidence is compelling; any direct account of human behaviour must be much more restrained.

The Question of Human Presence

A reindeer bone from the Castlepook collection has been reported as bearing a mark consistent with cutting or chopping by a sharp stone tool and as dating to approximately 33,000 BCE. If that interpretation is confirmed, it may represent the earliest known indication of human activity in Ireland, perhaps a brief visit by Upper Palaeolithic hunters who processed reindeer. It is an intriguing possibility, particularly because hunter-gatherer communities were established elsewhere in north-west Europe during this broad era.

It is not, however, evidence for a settled Irish population in 31,928 BCE. The specimen derives from an old collection rather than a modern excavation of an undisturbed camp floor. No securely associated stone-tool assemblage, hearth, dwelling, human bone, burial, repeated butchery area or occupation surface of comparable age has been recovered at Castlepook. The identification of a surface mark as human-made requires taphonomic judgement, separate from the dating of the animal itself. Earlier assessments of the Castlepook collection stressed the absence of demonstrable human traces there; later reports have urged renewed examination. The proper conclusion is that the cave offers a potentially important clue, not proof of continuous habitation.

This distinction is more than technical. A single hunter's visit, if it occurred, would not establish a population, a territory or an enduring route into Ireland. It tells us nothing secure about the visitors' language, kinship, clothing, shelters, social organisation or whether they returned. Nor should Ireland be assigned the cave art, elaborate ornaments, graves or named archaeological cultures documented elsewhere in Upper Palaeolithic Europe. Such material is valuable comparative context, but it has not been found in securely dated Irish contexts of this age.

Society Without a Record

For the same reason, political affairs, warfare, diplomacy and trade cannot responsibly be described for Ireland around 31,928 BCE. There were no states, chiefs or peoples known by name, and there is no evidence for negotiated alliances, organised conflict, exchange networks or territorial rule on the island. If small groups of people reached Ireland, they would have belonged to mobile foraging societies whose decisions were shaped by weather, animal movements, fuel, safe routes and the availability of shelter. That is a general inference from Upper Palaeolithic lifeways elsewhere, not a demonstrated description of Irish society.

Economy, in the later sense of managed production and trade, is equally invisible. The only possible subsistence activity suggested near this date is the processing of an animal, probably reindeer, at or in connection with Castlepook Cave. There is no evidence for farming, livestock keeping, pottery, metalworking, permanent built settlement or long-distance commerce. Flint or another suitable stone could theoretically have been used to butcher an animal, but no tool securely linked to the disputed reindeer mark has been identified. Even the existence of a hunting party remains an interpretation awaiting stronger contextual evidence.

Religion and learning also lie beyond the surviving record. Caves can acquire ritual meanings in many societies, but that fact does not make Castlepook a sanctuary. No Irish Ice Age image, sculpture, musical instrument, grave good, symbolic deposit or inscription can securely be assigned to this period. The absence of such evidence is not evidence that people lacked beliefs or knowledge; it means only that archaeology cannot recover them here. At this chronological depth, intellectual honesty requires silence where the material record is silent.

What Endured

The most important development around 31,928 BCE was environmental rather than political: Ireland was entering the severe climatic trajectory that would culminate in widespread ice-sheet occupation and erase or bury much of the preceding landscape. Castlepook Cave preserves a rare glimpse of the world before that transformation—an Ireland of cold open ground, large herbivores and dangerous carnivores, not yet the fully glaciated land of the Last Glacial Maximum.

Whether people were also present remains a live archaeological question. The reported modified reindeer bone deserves careful testing through renewed excavation, direct dating, microscopic study and secure association with sediments or tools. Until such evidence accumulates, Ireland at this date should be understood neither as certainly unpeopled nor as a settled Ice Age homeland. It was a marginal, changing northern landscape with a documented animal community and, at most, a tantalising indication of fleeting human contact. That narrow but significant evidence is the true historical inheritance of 31,928 BCE.

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31927 BCE

Derryvree Freshwater Sequence^[74]



The label 31,927 BCE gives a misleading impression of precision. No Irish community used a calendar of this kind, and no archaeological or environmental record can be assigned responsibly to one named year so far back. Expressed in the convention used by Quaternary scientists, this nominal date falls roughly 33,876 years before present, where “present” means 1950. That conversion is only a way of locating the date on a modern timescale; it is not a date obtained from an Irish object or deposit.

The more defensible setting is the later part of the Pleistocene, within Marine Isotope Stage 3 and before the Last Glacial Maximum. For Ireland, evidence close to this point comes chiefly from sediments, fossil plants and animals, cave deposits, landforms and radiometric dating. It does not provide a conventional national history. There are no names, political institutions, settlements, monuments, written traditions or securely dated human communities to describe. Ireland’s story at this depth of time is principally one of a cold northern landscape, its wildlife, and the advancing instability of the last great ice sheet.

A Date Within Broad Ranges

The most important Irish evidence is the Derryvree freshwater sequence near Maguiresbridge in County Fermanagh. Roadworks in 1969 exposed silts and fine sands containing organic material between two distinct sheets of glacial till. The deposit produced a conventional radiocarbon age of 30,500 years before present, with a substantial uncertainty. When recalibrated, the published span is approximately 36,900–31,700 calendar years before present. The nominal date of 31,927 BCE lies within that broad

range, but this does not mean that the sediment was laid down in that exact year. It accumulated over time, and the calibrated range expresses the statistical limits and complications of deep radiocarbon dating.

Derryvree nevertheless gives unusually valuable local evidence. Its fossil flora and fauna indicate open tundra vegetation and a periglacial climate: ground subject to severe cold, freezing and thawing, but not then buried beneath permanent ice. The site was later overridden or enclosed by glacial deposits, which is why this brief window into an earlier landscape survived at all. A similar organic deposit beneath till at nearby Greenagho reinforces the conclusion that north-central Ireland retained ice-free ground until around 34,000 calendar years ago, although neither locality can be used as a weather station for the whole island.

This is an important distinction. “Ice-free” did not mean warm, wooded or easy to inhabit. It means that parts of the land surface were exposed. The Derryvree evidence supports an open, cold environment with low vegetation rather than the familiar green, hedged and wooded Ireland of recent centuries. It cannot tell us the exact season, local temperature, snow depth or plant cover in 31,927 BCE.

Landscape on the Edge of Change

Ireland was approaching a profound environmental transformation. Research on the last Irish Ice Sheet indicates that its principal expansion began from conditions that included ice-free terrain at about 34,000 calendar years ago. Over succeeding millennia ice expanded dramatically; by the Last Glacial Maximum, conventionally placed around 26,000–19,000 years ago, much or probably all of Ireland was glaciated. The timing, thickness and precise limits of ice varied between regions and remain subjects of active geological research. The sound conclusion for this nominal year is therefore not that the entire island was already frozen over, but that it lay near the opening of the final major phase of ice-sheet growth.

Later ice reshaped much of the evidence that might otherwise have survived. It eroded older soils, moved boulders, rearranged sediments and buried earlier land surfaces. Drumlin fields, moraines, eskers, scoured rock and glacial deposits visible in Ireland today are long-term results of that changing ice regime, not features that can be dated individually to this year. Their value is cumulative: combined with radiocarbon dating, marine cores and cosmogenic exposure dating, they allow scientists to reconstruct broad sequences of advance and retreat.

Sea level was lower globally because vast quantities of water were locked in ice sheets. The coasts and shallow seas around Ireland were consequently very different from those of today. Yet a lower sea level alone does not settle whether people or animals could have crossed from Britain by dry land at any particular moment. Reconstructions of the Irish Sea basin, glacial ice and relative sea level are complex, and scholars have differed over the availability of land, ice or marine corridors. It is safest to say that Ireland’s geographical isolation and its practical accessibility fluctuated, rather than to imagine a certain land bridge in 31,927 BCE.

Tundra and Animal Life

The Derryvree deposit directly supports the presence of an Arctic-alpine, tundra-like plant community in inland Fermanagh. Such vegetation would have been low and open, with grasses, sedges, herbs, mosses and hardy dwarf plants better suited to cold ground than trees. Periglacial processes would have affected

exposed soils and slopes. This was not a single, static ecosystem: climate shifts, snow cover, moisture, soils and the spread of ice would have repeatedly altered which habitats were available.

Irish caves and fossil collections show that the island supported a striking Pleistocene fauna during parts of this wider period. Castlepook Cave near Doneraile, County Cork, is particularly important. Its deposits have produced remains attributed to animals including reindeer, woolly mammoth, giant deer, brown bear, Arctic fox, lemmings and spotted hyaena. Those finds establish that Ireland participated in the wider ecological world of north-western Europe. They do not establish that every species occurred everywhere, or that each was alive in the same season or century as the Derryvree deposit.

Recent redating has made this caution essential. Improved methods of preparing and dating bone from Castlepook and other southern Irish caves have shown that some older measurements were thousands of radiocarbon years too young. The revised work suggests that certain animals, notably giant deer and spotted hyaena, may have disappeared locally before about 40,000 calendar years ago. Cave assemblages are also shaped by scavenging, animal dens, water movement, sediment disturbance and the limited recording methods of nineteenth- and early twentieth-century excavations. A bone in a cave is compelling evidence of an animal's past presence, but not a complete census of an ecosystem.

Even so, the broader interpretation is clear. Cold-adapted herbivores and predators moved through a changing mosaic of exposed ground, watercourses, rock shelters and seasonal forage. Reindeer are especially plausible indicators of open cold-country environments, while lemmings and Arctic fox point to severe conditions. Mammoth and hyaena remains demonstrate that the island's Pleistocene fauna was far richer and less familiar than its modern terrestrial fauna. The coming growth of ice would severely contract or eliminate many of these habitats.

The Unresolved Human Question

No securely excavated hearth, dwelling, settlement floor, burial, stone-tool assemblage or human skeleton has been dated to Ireland around 31,927 BCE. Therefore there is no evidence for a resident population, family group, political authority or named Upper Palaeolithic culture on the island at this time. Terms such as "Irish people", "tribes" or "chiefs" would be anachronistic and unsupported.

There is, however, an important but still limited claim from Castlepook Cave. A reindeer bone from an old collection has been reported as bearing marks consistent with butchery by a stone tool and as dating to around 33,000 years ago. If its human origin, chronology and association are confirmed through full specialist publication and contextual work, it would indicate that Upper Palaeolithic people reached Ireland much earlier than previously accepted. It would still record a brief action on an animal carcass, not a village or a continuous occupation.

The best published direct 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 before present. That discovery demonstrates why fragmentary bones matter, but it also underlines the gap. A possible early visit, however intriguing, cannot supply the missing evidence for social organisation, language, kinship, ritual, art or learning in the thirty-second millennium BCE.

No Politics, but a Material World

For this date there can be no responsible account of Irish diplomacy, warfare, government, taxation, trade or religion. None is evidenced. Nor is there evidence for farming, domesticated animals, cereal cultivation, pottery, metalworking or permanent settlement. The economy, if people did visit, would have

been a short-term hunter-gatherer engagement with available animal and plant resources. The possible modified reindeer bone permits that narrow inference only: it may signal carcass processing. It cannot reveal whether an animal was hunted, scavenged, shared, exchanged or encountered by a party staying for hours rather than generations.

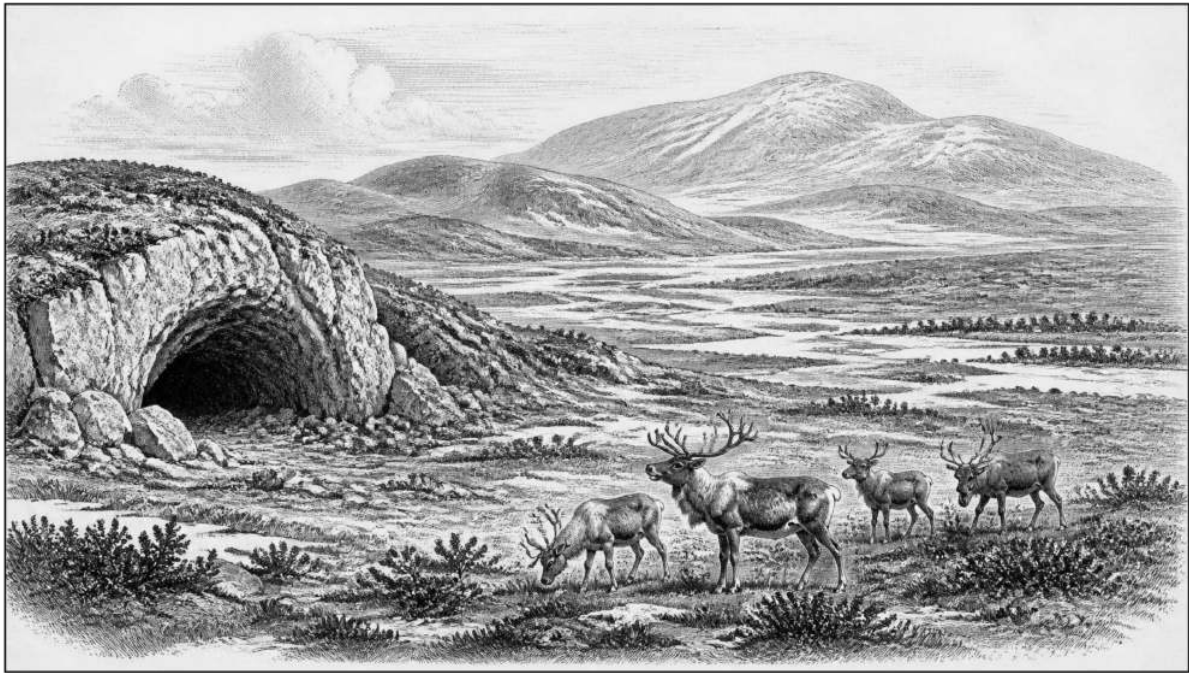
Upper Palaeolithic communities elsewhere in Europe made sophisticated stone, bone and antler tools and, in some regions, created cave art and portable images. Those achievements provide valuable continental context, but they are not evidence that equivalent practices occurred in Ireland. At present, Irish archaeology cannot attach art, ritual, technical traditions or long-distance exchange networks to 31,927 BCE. The appropriate historical emphasis is on absence as well as presence: absence of demonstrated human institutions, and the presence of a real but changing Ice Age environment.

Thus Ireland at this point was neither a blank map nor a recoverable prehistoric society. It was an inhabited landscape in the ecological sense, with tundra vegetation and Pleistocene animals documented in a sparse, uneven archive. Around it, ice-sheet growth was beginning to reorganise land, sea and habitat on a vast scale. The sediments at Derrynvree, the caves of Cork and Clare, and the glacial landforms across the island preserve fragments of that world. Together they allow a careful history of environmental change, while insisting that the imagined precision of a single BCE year must not be mistaken for knowledge of a single day.

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31926 BCE

Cave Bone Taphonomy^[75]



The label “31,926 BCE” is useful for organising a modern chronology, but it must not be mistaken for a date that prehistoric Ireland’s evidence can resolve. No Irish event, individual, journey or settlement can be assigned to this calendar year. In conventional before-present terms, it falls roughly 33,876 years before 1950; archaeological and environmental dating at this depth works in broad ranges, not annual entries. The responsible subject is therefore Ireland during the later part of Marine Isotope Stage 3, before the fullest advance of the last British–Irish Ice Sheet.

A Landscape Without Annals

There were no states, rulers, written laws or diplomatic relations in Ireland that can be recovered for this time. Nor can archaeologists identify a village, burial ground, hearth or tool-making floor securely belonging to 31,926 BCE. The island’s history is instead approached through geological traces, cave deposits, animal bones and laboratory dating. These sources illuminate changing environments and occasional animal presence far more clearly than they illuminate human lives.

The distinction matters. A radiocarbon date on a bone establishes, within an uncertainty range and after calibration, when the animal lived or died; it does not automatically date a human visit to the same cave. Likewise, a scratch or incision on bone may be consistent with a stone tool, but it must be distinguished from carnivore teeth, trampling, sediment movement, excavation damage and other natural processes. Ireland’s Pleistocene cave collections are especially difficult because many were excavated in the nineteenth and early twentieth centuries, before modern recording standards, and deposits were often mixed or disturbed.

Even the geographical word “Ireland” needs care. The landmass was recognisably the foundation of the modern island, but coastlines, sea levels and ice margins were very different. Lower global sea levels exposed large areas of the continental shelves around north-west Europe. Whether particular routes between Ireland, Britain and the continent were dry, icy, shallow marine or impassable varied through time and remains debated. It is safer not to imagine a modern coastline, nor to assume an easy land crossing.

Before the Last Glacial Maximum

31,926 BCE lay before the global Last Glacial Maximum, usually defined as about 26,500–19,000 calibrated years before present, and before the local maximum of the British–Irish Ice Sheet, which current large-scale reconstructions place broadly around 27,000 years ago. That does not mean Ireland was uniformly mild or ice-free. Ice sheets grow, thin and shift unevenly; individual valleys, uplands, shelves and coasts can have very different histories. The best reconstruction is one of an unstable cold-stage world, in which expanding ice was becoming an ever more powerful force in Ireland’s environmental history.

Later ice would cover most, perhaps nearly all, of Ireland and profoundly rework the terrain. Evidence from glacial landforms, offshore sediments and exposure dating shows ice moving across the mainland and onto the Atlantic and Celtic Sea shelves during the last glaciation. Yet the precise form of the ice sheet at the earlier horizon represented by 31,926 BCE cannot be read as a single map with complete confidence. Recent BRITICE-CHRONO research stresses that the maximum advance and the beginning of retreat were asynchronous across different sectors. Regional variation is therefore more than a technicality: it prevents a false picture of one uniform white cap descending everywhere at once.

The long-term consequence is visible in modern Ireland’s physical geography. Glacial erosion and deposition helped shape basins, valleys, moraines, drumlin fields and meltwater routes. But these familiar features are not snapshots of this year. They are the accumulated legacy of advances and retreats over millennia, often modified by later water, soil formation and human activity.

Animals in a Changing World

Irish cave deposits show that animals occupied parts of the country during the pre-maximum cold stage. The Irish Quaternary Fauna Project found evidence for a wider mammal community between at least about 45,000 and 20,000 years ago, although the record is sparse and heavily dependent on caves. Castlepook Cave, near Doneraile in north County Cork, is particularly important: it has produced remains attributed to animals including woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena. Re-dating work has shown that some earlier measurements from southern Irish caves underestimated the age of specimens, pushing elements of the fauna further back into Marine Isotope Stage 3.

This evidence supports a broad conclusion, not a complete animal census for 31,926 BCE. The creatures represented in cave assemblages did not necessarily live together, in the same numbers, or during the same season. Caves can be carnivore dens, natural traps or channels into which water and sediment carry bones from outside. A hyaena may have accumulated prey; a bone may have been moved long after the animal’s death. Nevertheless, reindeer and other cold-adapted or open-country fauna indicate that at intervals parts of Ireland offered habitable ground rather than permanent, continent-wide ice.

Vegetation must also be reconstructed cautiously. Conditions before the Last Glacial Maximum were generally colder and more variable than today, and woodland of the modern Irish kind would be inappropriate for much of the exposed landscape. Open herb-rich grassland, shrub tundra and patchy vegetation are reasonable regional analogies, but their local mixture would have depended on altitude, soil, drainage, wind exposure and the proximity of ice. Such country could sustain grazing animals, scavengers and predators, while simultaneously offering an exacting, seasonal environment for any people entering it.

A Possible Human Trace

The most consequential, and most tentative, human evidence relevant to this remote period comes from Castlepook Cave. A reindeer femur from the historic collection has been reported as bearing deep marks interpreted as butchery with a broad stone or flint edge, and public reporting placed it at around 33,000 years ago. If that interpretation is sustained, it would push evidence of human activity in Ireland dramatically earlier than the better-established terminal Pleistocene evidence from Alice and Gwendoline Cave, County Clare.

But the claim must be kept in proportion. The dated object is animal bone, not a human skeleton. The reported marks suggest an action on a carcass, not a residence. They do not demonstrate a permanent population, a named people, a camp at Castlepook, a family group, a sea crossing, or uninterrupted occupation of Ireland. A 2022 excavation at the cave recovered faunal material and investigated surviving sediments but identified no cultural artefacts. Its importance lies partly in showing how much still depends on finding undisturbed deposits with securely associated tools, bones and dates.

At the broad European scale, anatomically modern humans had spread into parts of north-west Europe before the Last Glacial Maximum. Their Upper Palaeolithic lifeways involved highly mobile hunting and gathering, sophisticated stone technologies, the use of animal materials and, in some regions, ornaments and figurative art. None of those cultural achievements can be transferred automatically to Ireland. The Irish evidence does not identify a specific Upper Palaeolithic tradition, language, ritual practice or artistic repertoire at this horizon. Comparison may indicate what a brief visiting party could have known elsewhere; it is not proof of what occurred here.

Society, Economy and Belief: What Cannot Be Claimed

If people did reach Ireland around this wider period, a practical encounter with animal resources is the only modest economic inference currently available. Butchery marks, if human-made, could relate to obtaining meat, marrow, hide, sinew or bone. They cannot reveal how food was shared, whether hunters acted alone or in a group, or whether an animal was hunted locally, scavenged or encountered already dead. There is no evidence for farming, herding, pottery, metalworking, managed woodland, exchange networks or settled domestic architecture.

There is equally no direct basis for describing warfare, alliances, leaders, territorial boundaries or diplomacy. In an archaeological sense, conflict could potentially be investigated through weapons, trauma, defended places or patterned destruction; none is available for Ireland at this date. Religion and learning are also beyond recovery. No Irish cave art, formal burial, shrine, inscribed object or symbolic assemblage securely belongs to this phase. Silence in these categories is not evidence that Ice Age people lacked social bonds, beliefs or knowledge; it is evidence that Ireland has not preserved, or has not yet identified, material traces capable of demonstrating them.

The Importance of the Gap

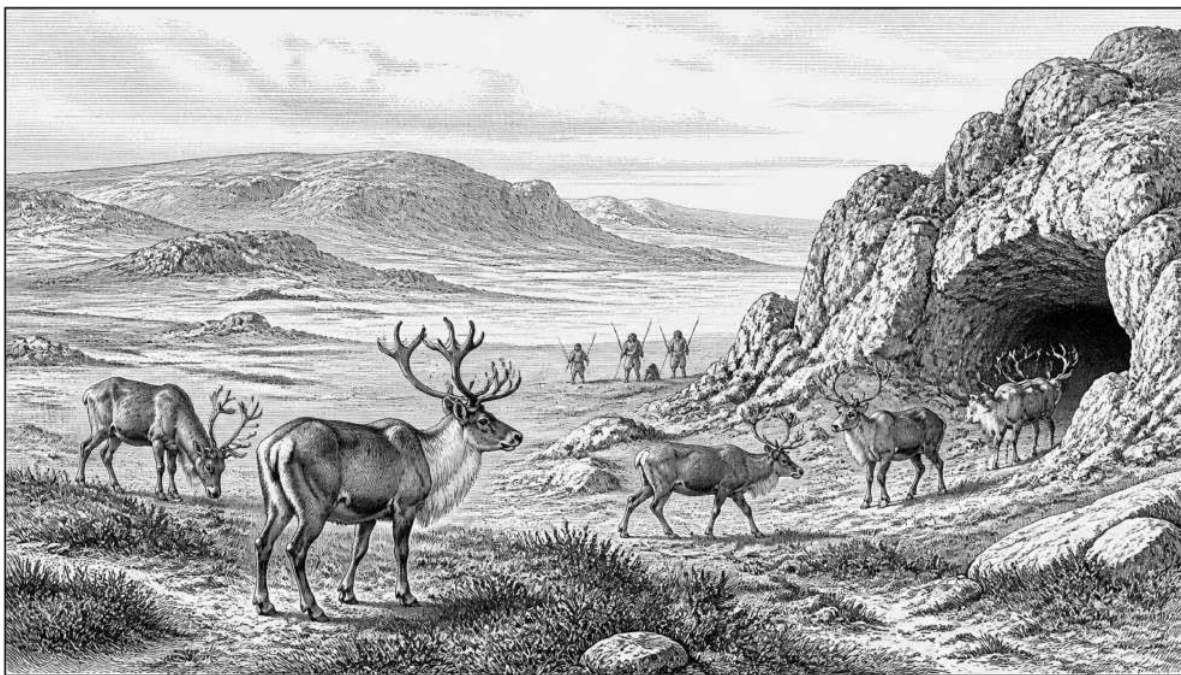
The central fact of Ireland around 31,926 BCE is therefore uncertainty within a changing Ice Age landscape. Faunal evidence makes clear that the country was not simply outside the Pleistocene world of animals. The Castlepook bone offers a potentially momentous sign that people may also have made a fleeting appearance before the great expansion of ice. Yet the interval between such possible visits and the island's much later, substantial Mesolithic settlement remains immense. Clear evidence for sustained settlement appears only after the post-glacial transformation, by about 8000 BCE.

For this year, then, Ireland has no political narrative and no calendar event. It has a fragile archive: cave bones, contested surface modifications, calibrated ranges, sedimentary histories and the future imprint of ice. That archive is enough to show an island-landmass at Europe's north-western edge, environmentally connected to a wider Ice Age world, but not enough to populate it confidently with a continuous human society.

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31925 BCE

Carden's Castlepook Interpretation ^[76]



Modern calendar-year precision is not available for Ireland at 31,925 BCE. The label is a convenient point on a modern timeline, not a date that anyone then could have recognised or recorded. In archaeological terms it corresponds only approximately to 33,900 years before present, where “present” conventionally means AD 1950. Radiocarbon dates, their calibration and the limits of old cave collections all produce ranges rather than single historical years. The responsible question, therefore, is not what happened in Ireland in one precise year, but what the evidence can say about the island in this phase of the Late Pleistocene.

That evidence places Ireland in the Upper Palaeolithic world, during Marine Isotope Stage 3 and before the fullest expansion of the last British–Irish Ice Sheet. The Last Glacial Maximum is generally dated later, broadly from about 26,500 to 19,000 calibrated years BP, although the growth and movement of ice were neither uniform nor identical in every Irish region. Around the notional year 31,925 BCE, climates were already cold and unstable, sea levels were much lower than today, and Ireland’s landscapes and coastlines differed profoundly from those familiar in the modern island.

A Landscape Approaching Glaciation

Ireland was not yet simply the ice-covered island often imagined from accounts of the Last Glacial Maximum. Research on the British–Irish Ice Sheet indicates that major ice expansion followed this period and reached maximum extent around 27,000 years BP in some reconstructions. Yet conditions were severe, and the record points to rapid environmental change before, during and after the maximum. Ice caps and glaciers occupied uplands and western and northern areas at different times; periglacial processes repeatedly froze, fractured and shifted exposed ground. Any attempt to draw a neat national boundary between “ice-free” and “glaciated” Ireland would be misleading.

Much of the terrain available to animals and any visitors would have been open rather than wooded: a cold mosaic of grassland, herb-rich steppe, dwarf shrubs, bare sediment and patches of wet ground. The Atlantic shoreline lay farther west and south because so much of the world's water was stored in ice sheets. Ireland was part of a wider north-west European land-and-sea setting, but the precise routes linking it with Britain and continental Europe changed with sea level, glaciers and local marine conditions. Low sea level did not automatically create an easy, continuous land bridge across every channel. Travel, if it occurred, may have required crossings through a shifting and dangerous glacial landscape.

It is the animals, rather than settlements, that provide the clearest Irish evidence for this early phase. Cave deposits and fossil finds show that Late Pleistocene Ireland supported a changing fauna that included reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare and, at Castlepook Cave in County Cork, spotted hyaena. Their presence should not be compressed into one simultaneous "Ice Age menagerie": individual specimens belong to different dates and deposits, and some older radiocarbon results have been revised as laboratory methods improved. Nevertheless, the combined record demonstrates that Ireland could, at intervals, sustain substantial grazing animals and carnivores before the ice sheet's maximum advance.

The Castlepook Possibility

The most directly relevant clue is from Castlepook Cave near Doneraile, north County Cork. The cave was explored in the early twentieth century and produced a remarkable but difficult collection of animal remains. A fragment of reindeer femur, reported as dating to roughly 33,000 years ago, bears a deep mark interpreted by zoologist Ruth Carden as damage made by a sharp stone implement during butchery. County Cork's heritage publication identifies the object as a Palaeolithic reindeer bone, while ongoing archaeological work has sought better contextual evidence from the cave.

If that interpretation is confirmed, it is exceptionally important: it would indicate that people reached Ireland in the period broadly represented by this article, more than 20,000 years before the long-accepted beginning of substantial Mesolithic settlement. It would show an act of carcass processing, probably connected with highly mobile hunters exploiting reindeer. It does *not*, however, prove a permanent settlement at Castlepook, an enduring population across Ireland, or a named people with a securely identified tool tradition. No uncontested Irish Upper Palaeolithic camp surface, hearth, dwelling, stone-tool assemblage or human burial has yet been linked to this date.

The distinction matters because Castlepook is a cave bone assemblage shaped by natural processes as well as by ancient activity. Carnivores carried and chewed bones; water, sediment movement and early excavation disturbed their original relationships. The old collections are invaluable, but they were not recovered to the standards expected of a modern, finely stratified excavation. Thus the reindeer bone is best treated as compelling evidence of a possible human episode, not as a licence to invent an Irish village, a hunting band's identity or a continuous national prehistory.

People Without a Recorded Society

There is no evidence from Ireland at this date for political institutions, rulers, territories, diplomacy or organised warfare. Nor can archaeology responsibly identify language, kinship rules, religious beliefs, artistic conventions or a calendar. Such absences are not evidence that people elsewhere lacked social lives; Upper Palaeolithic communities on the European mainland demonstrably made sophisticated stone

and organic tools, ornaments, images and burial places. But Ireland has not yielded corresponding material from around 31,925 BCE. Continental labels such as Gravettian, used for archaeological traditions dated broadly between about 34,000 and 25,000 years ago, should therefore not be applied automatically to Ireland.

If humans did visit Castlepook's region, their everyday economy was almost certainly based on hunting, gathering and the skilful use of animal materials, rather than farming, herding or trade in the later sense. Reindeer would have offered meat, hide, sinew, bone and antler; a sharp flint or other stone edge could help disarticulate and process a carcass. Yet even this is an inference from the cut-marked bone and better-known mainland practices, not a recovered Irish toolkit. Whether a carcass was killed locally, scavenged, butchered in the open and later dragged into the cave by predators, or processed by a passing party cannot presently be resolved.

There is likewise no basis for describing formal trade. Movement across the broader landscape may have brought people, animals and raw materials into contact, but no imported object, exchange route or repeated seasonal circuit is known from Ireland at this time. The most defensible picture is of a sparsely evidenced frontier landscape in which the survival of any small human party would have depended on mobility, environmental knowledge, cooperation and access to animal resources.

Caves, Predators and Evidence

Castlepook also reminds us that caves are not neutral archives. They could provide shelter to animals and people, but they are particularly effective traps for the remains of hyaenas, bears and their prey. Spotted hyaena is especially significant: its bones and fossil evidence from Castlepook indicate that Ireland lay within the range of large carnivores now absent from the island. Mammoth remains from the cave and other southern Irish finds point to a colder, more open environment than modern Cork. The apparent scarcity of some animals familiar in contemporary Britain and continental Europe may represent real ecological differences, but it can also reflect the small and uneven Irish fossil sample.

Later ice action further complicates the archaeological record. Advancing glaciers eroded landscapes, transported sediment and potentially removed or buried fragile open-air sites. Rising post-glacial seas subsequently drowned former coastal plains and shorelines, where mobile hunter-gatherers elsewhere often concentrated activity. The lack of early sites in Ireland is therefore historically meaningful but cannot be read as proof that no human being ever set foot on the island before the Mesolithic. It is a record shaped both by past human presence and by what survived thousands of years of glaciation, erosion and sea-level change.

What Can Be Said for Ireland

For this point around 31,925 BCE, Ireland was a cold Late Pleistocene land on the threshold of more extensive glaciation, inhabited at least intermittently by Ice Age fauna and connected environmentally to a wider north-west European world. County Cork's Castlepook Cave offers the strongest currently reported indication that humans may have processed a reindeer carcass here at roughly this time. That single clue is potentially transformative, but it remains too slight to support a detailed narrative of population, culture or power.

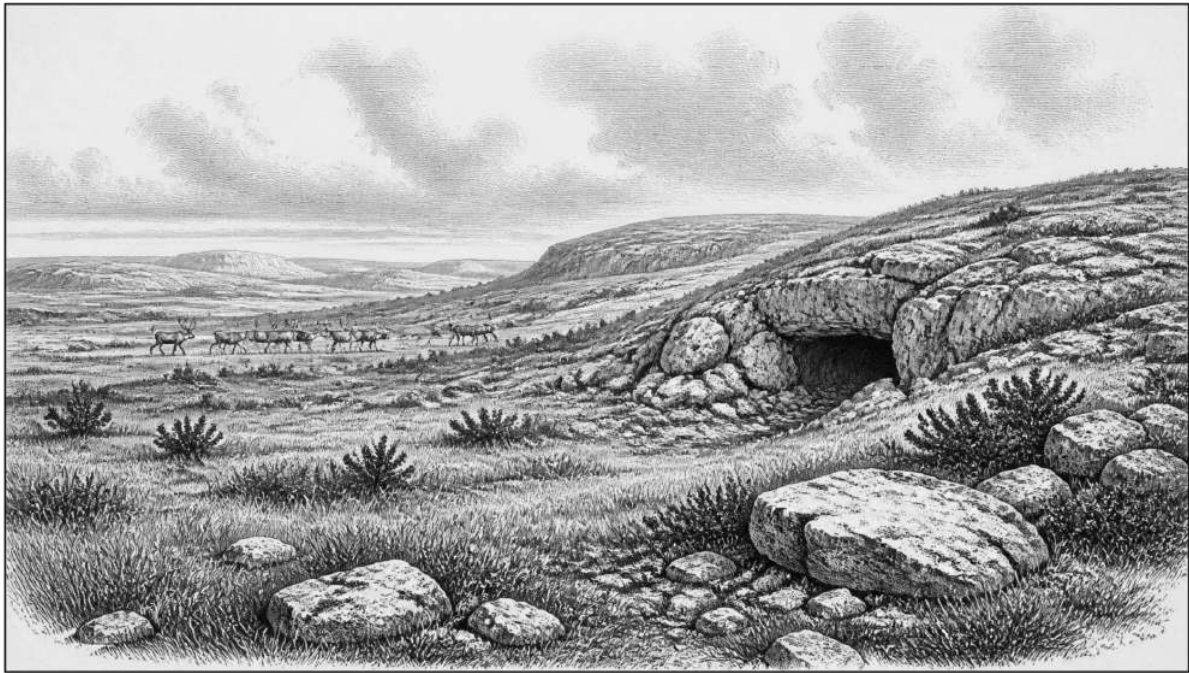
The next securely visible chapters of Irish prehistory lie much later. Following deglaciation and ecological recovery, the island was recolonised by plants and animals; the first substantial archaeological evidence for human settlement belongs to the Mesolithic, around the early eighth millennium BCE, with

Mount Sandel in County Antrim among the key sites. The interval between Castlepook's possible Palaeolithic visitors and those later communities is vast. Its silence is not empty history: it is an invitation to further cave research, improved dating, careful excavation and a disciplined willingness to distinguish a suggestive trace from a demonstrated past.

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31924 BCE

The Castlepook Femur^[77]



The numerical label 31,924 BCE cannot denote an Irish historical year in the ordinary sense. No people on the island used such a calendar; there are no texts, rulers, settlements or events that archaeology can assign to it. Measured against the conventional radiocarbon reference date of AD 1950, it falls roughly 33,900 calendar years before present, or 33.9 ka cal BP. At that depth of time, even good scientific dates are ranges, not anniversary dates. The responsible subject is therefore Ireland during a broad interval around the later part of Marine Isotope Stage 3, within the Late Pleistocene and Upper Palaeolithic of north-west Europe.

Evidence Rather Than Annals

The evidence is exceptionally uneven. Ireland has no securely identified house, hearth, grave, tool assemblage or settlement surface of this age. Its record comes principally from animal bones, cave deposits, glacial sediments, landforms and changing shorelines. These are powerful sources for reconstructing environments, but they do not provide an annal of a particular hunt, migration or season. Much of the island's earlier surface archaeology was also vulnerable to erosion, burial and destruction as the last ice sheet expanded. Absence of a camp is not conclusive proof that no person ever entered Ireland; equally, it cannot be converted into proof of a settled population.

The central place in this inquiry is Castlepook Cave, near Doneraile in north County Cork. Excavations there between 1904 and 1918 recovered a large, historically accumulated collection of bones from more than one deposit and from a cave system later affected by water and disturbance. Geological Survey Ireland describes Castlepook as Ireland's richest vertebrate-fauna site for the period leading

towards the Last Glacial Maximum. Direct dates on individual bones span a very long interval, approximately 45,700 to 19,950 years BP. That range itself is a warning: the cave was a repository used or entered by animals over millennia, not a single frozen moment in time.

A Cold, Changing Island

Around 33.9 ka cal BP, Ireland lay within an unstable glacial world, but the great maximum of the last British–Irish Ice Sheet still lay ahead. Reconstructions differ in detail because ice advanced and retreated differently across regions, and because dates from land, seabed and cave sequences do not all resolve the same intervals. The broad picture is secure: ice-sheet growth was under way during the last glaciation, while full coverage of Ireland and its shelf belongs chiefly to the later maximum, generally placed around 27,000–23,000 cal BP. It would be misleading to depict all Ireland in 31,924 BCE as a uniform, permanent white desert, or to draw a precise ice margin for that nominal year.

What can be said is that conditions were colder, more seasonal and generally more open than those of modern Ireland. Treeless or sparsely wooded communities of grasses, herbs, sedges and low shrubs are more plausible than the familiar oak-and-hazel woodland of the Holocene. Wind, frost, snow cover and frozen or waterlogged ground would have affected where animals could graze and where people, if present, could travel. Yet conditions changed repeatedly within Marine Isotope Stage 3. A cave bone dated to a broad interval cannot by itself supply the weather of one Cork valley in one notional year.

Sea level was substantially lower than it is today because large volumes of water were stored in global ice sheets. The continental shelves around Ireland were consequently more exposed in places, altering coasts and possible routes for mammals. But low sea level did not automatically make an easy, continuous dry corridor from Ireland to Britain or mainland Europe. The Irish Sea was shaped by complex topography, local ice and relative sea-level change. Later modelling demonstrates how disputed and short-lived any connections could be. For this earlier period, an exposed coastal plain, narrow crossings, seasonal ice, or several changing routes are possibilities rather than demonstrated pathways.

Castlepook's Animal World

Castlepook nonetheless proves that sizeable mammals reached parts of Ireland before the Last Glacial Maximum. Its Ice Age fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena; later deposits also contain Arctic fox, wolf and lemmings. These names should not be treated as a complete list of animals alive beside one another in 31,924 BCE. Some remains are separated by many thousands of years, and revised laboratory techniques have altered earlier chronologies. The strength of the collection is cumulative: it demonstrates repeated occupation of Irish landscapes by cold-stage fauna, not a single perfectly dated ecosystem.

The most evocative interpretation of the cave is as a carnivore-associated bone assemblage. Hyaenas could transport and gnaw bones, while water movement and earlier excavation mixed materials further. A mammoth bone in a cave does not mean that a mammoth died in that chamber; it may record scavenging, transport or redeposition. Nor should the modern label Irish elk obscure the point that giant deer was one element of a changing Pleistocene fauna, not an emblem of an already Irish national landscape. The animals reveal ecological opportunity as well as hardship: grazing and browsing resources supported herbivores, whose carcasses in turn supported predators and scavengers.

Reindeer are especially relevant. Their presence suggests open country capable of supporting highly mobile herd animals, and such herds could have provided a compelling resource for Upper Palaeolithic hunters elsewhere in Europe. But mobility matters. A herd passing through a region does not establish a permanent human community there, and the sparse Irish fauna indicates a more restricted record than that available from many British or continental sites. Ireland was on the north-western edge of a wider Ice Age world, rather than a documented centre of sustained population.

The Mark on a Reindeer Bone

One Castlepook object brings the human question unusually close to this article's date: a reindeer femur reported by Ruth Carden and County Cork heritage publications as bearing a mark made by a sharp stone tool during butchery. The publication places it at about 31,000 BC, broadly close to but not precisely identical with 31,924 BCE. If the mark is correctly identified as anthropogenic, it is important evidence that a person or people processed a reindeer in Ireland during the Upper Palaeolithic, vastly earlier than the long-established Mesolithic settlement record.

Its implications must remain proportionate. A cut mark is physical evidence on one bone; a visiting hunting party, seasonal pursuit of reindeer, or a group travelling from Britain are interpretations built around it. The bone does not demonstrate that hunters killed the animal at Castlepook, occupied the cave, lived nearby or returned repeatedly. Indeed, the bone may have reached the cave after carcass processing elsewhere, carried by a carnivore or moved through natural processes. No securely associated stone tools, hearth, dwelling, human remains or intact occupation floor of comparable age has yet been recovered. The National Museum of Ireland continues to describe clear Palaeolithic human presence as unproven, while the 2022 excavation at Castlepook found no cultural artefacts.

This is not merely excessive caution. Castlepook's early excavations did not meet modern standards of stratigraphic recording, and subsequent research has shown why old cave-bone dates need reassessment. Improved pretreatment and radiocarbon methods produced substantially older dates for several Castlepook specimens than earlier results, altering the timing of animals including giant deer and spotted hyaena. Future work on surviving deposits, microscopic analysis of modified bone, ancient biomolecules and new direct dating may either strengthen or qualify the human interpretation. The cave is valuable precisely because it preserves a question that can still be tested.

Society Without a Society?

There is no evidence for political authority, chiefs, territories, diplomacy, organised warfare, trade networks, religious rites or formal learning in Ireland at this date. Such categories require identifiable communities and social institutions; none can responsibly be reconstructed from the present record. There were no Irish kingdoms, no named peoples and no historical borders. Even language is beyond recovery. To assign later Celtic, Gaelic or national identities to these remote possible visitors would be an anachronism.

If the reindeer mark represents human butchery, the most that follows securely is the skilled use of a sharp cutting edge and knowledge sufficient to process animal tissue. Comparable Upper Palaeolithic groups in Europe were mobile hunter-gatherers who organised work, food-sharing, tool maintenance and knowledge of seasonal landscapes. That broader comparison can suggest the kind of practical social life possible in Ireland, but it cannot tell us the number, kinship, beliefs, speech or destination of the people involved. It is safer to speak of an episode of activity than of an Irish society.

Nor can an economy be described in the later sense of farming, livestock, markets or long-distance commerce. There is no evidence for cultivation, domesticated animals, pottery, metalworking or built settlement. Any human subsistence would have depended on wild resources, especially if hunters followed reindeer or exploited a carcass. The important economic relationship visible in the evidence is ecological: animal movement linked grazing grounds, predators, scavengers and perhaps occasional human foragers across landscapes whose coastlines and ice barriers changed through time.

Approaching the Ice Maximum

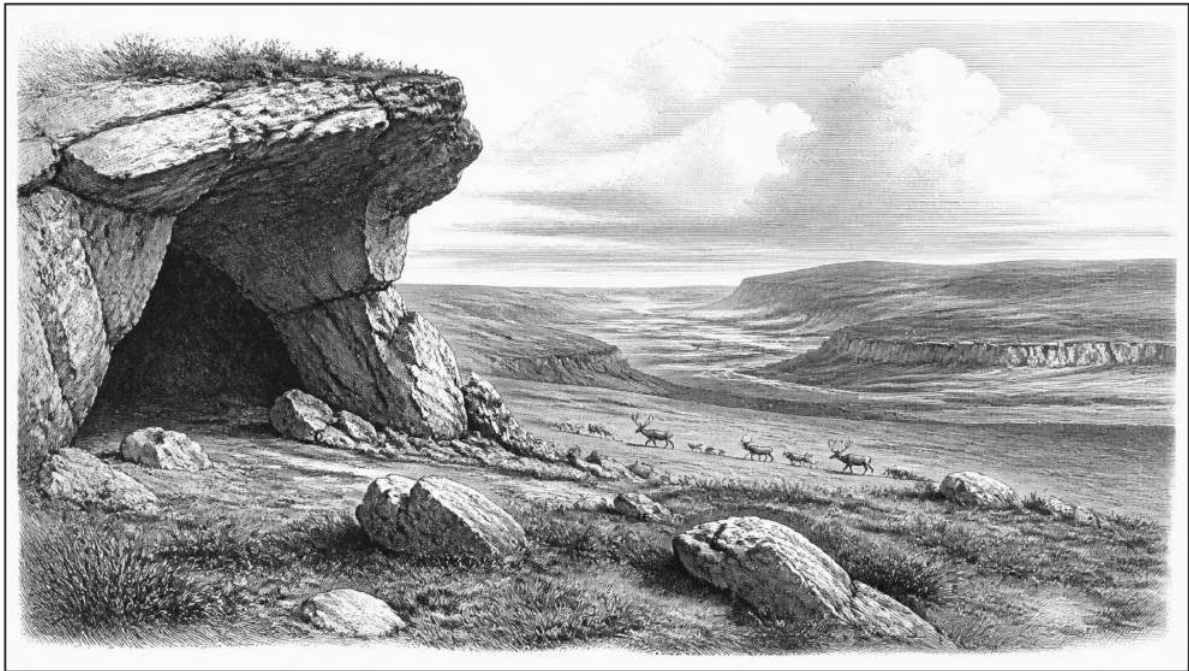
The future of this landscape was severe. In the millennia after the broad interval represented by 31,924 BCE, the British–Irish Ice Sheet expanded to cover all or almost all of Ireland and reached far onto the surrounding Atlantic and Celtic Sea shelves. Glacial erosion and deposition remade terrain, helping explain why early traces of people are so scarce and difficult to interpret. The later disappearance or local extirpation of particular animals also shows that Irish Pleistocene ecology was repeatedly broken and reassembled rather than steadily developing towards the modern fauna.

Thus the most historically meaningful account of 31,924 BCE is neither an invented first settlement nor an empty blank. It is a threshold within a long Late Pleistocene sequence. Cave bones from north Cork show that Ireland could support remarkable cold-stage animals; one marked reindeer femur raises the prospect of a fleeting human encounter with that world. The evidence does not yet reveal a community, a culture or an event in a calendar year. It reveals an island of shifting opportunities at the edge of the Ice Age, whose earliest possible human history survives in fragments and must be allowed to remain fragmentary.

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31923 BCE

Castlepook's Reindeer Horizon^[78]



“31,923 BCE” is a modern calendar label, not a year that can be isolated in Ireland’s archaeological record. No written calendar, event, person, settlement or political community can be assigned to it. At this depth of time, the responsible scale is millennia rather than single years: the date falls broadly within the later part of Marine Isotope Stage 3, before the Last Glacial Maximum, when climates in north-west Europe fluctuated sharply and the Irish landscape was moving towards a much harsher glacial phase. The evidence is sparse, indirect and often recovered long ago from disturbed cave deposits. Yet it is important, because north Cork preserves one of the strongest records of animal life in Ireland before the great ice advance.

A Date Beyond Calendar Precision

Archaeologists use radiocarbon determinations, stratigraphy, faunal study and geological dating rather than historical chronologies for this period. Radiocarbon years are not identical to calendar years and must be calibrated against changing atmospheric carbon levels; even then, dates are expressed as ranges with statistical uncertainty. The numerical year 31,923 BCE therefore should not be mistaken for an anniversary of a hunt, a migration or a climatic event. It is best understood as an approximate point within a long Upper Palaeolithic world, perhaps roughly 34,000 years before the conventional radiocarbon “present” of 1950.

That distinction matters especially in Ireland. The island’s pre-Last Glacial Maximum record is made chiefly from bones preserved in caves rather than from securely excavated campsites. Subsequent ice-sheet growth, erosion, water movement, carnivore disturbance and nineteenth- and early twentieth-

century digging have all reduced the chances of finding intact evidence. An absence of houses, hearths and tools does not prove that no person ever came; equally, it does not permit archaeologists to supply those missing things from imagination.

Castlepook Cave and Its Animals

The central Irish site for this period is Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. The limestone cave system lies above the Awbeg valley, north of the Blackwater. Excavations directed by the naturalist Richard J. Ussher between 1904 and 1912 produced a remarkably large collection of animal bones. Much material was lost or dispersed after excavation, while surviving specimens entered the National Museum of Ireland's collections. The original digging methods inevitably left a difficult legacy: bones from different layers and ages could be mixed, and the precise original position of many objects cannot now be reconstructed.

Even with those reservations, modern radiocarbon programmes have established that Castlepook contains remains from before, during and after the period approaching the Last Glacial Maximum. The wider Irish Quaternary Fauna Project concluded that a varied mammal community reached Ireland between at least about 45,000 and 20,000 radiocarbon years ago. At Castlepook and comparable southern cave sites, dated remains include reindeer, brown bear, wolf, Arctic fox, mountain hare, collared and Norwegian lemmings, giant deer and, in the broader assemblage, woolly mammoth and spotted hyaena. Shandon Cave in County Waterford adds evidence for horse, mammoth, reindeer and other animals in this pre-maximum interval.

This is not a roll-call from one afternoon on a Pleistocene plain. Each bone has its own date, and a cave collection accumulated across many generations of animals, sometimes over thousands of years. Some species were prey, some predators or scavengers, and caves could serve as dens, traps or natural repositories for material washed or dragged inside. Nevertheless, the assemblage demonstrates that Ireland was not simply an empty, uniform block of ice at every moment of the last glacial cycle. Around the broad era represented by 31,923 BCE, parts of the island supported a cold-adapted fauna.

An Open, Changeable Landscape

Reindeer and lemmings point towards open environments of grasses, sedges, herbs, mosses and lichens rather than closed woodland. Arctic fox and mountain hare reinforce the impression of cold conditions; mammoth, giant deer, wolves, bears and hyaenas indicate a food web with large herbivores and formidable carnivores. But this should not be pictured as a permanently frozen wasteland. Marine Isotope Stage 3 was marked by abrupt climatic oscillations. Relatively milder intervals could permit animal populations to expand into suitable habitats, only for worsening cold to fragment or remove those habitats again.

Regional variation was substantial. High ground, river valleys, exposed limestone and coastal lowlands did not respond to climate in identical ways. Lower global sea levels altered the surrounding continental shelf and coastlines, but the geography of passage into Ireland cannot be reduced to a simple land bridge. Ice margins, channels, changing relative sea level and terrain repeatedly reshaped potential routes between Ireland, Britain and continental Europe. The animal record proves that large mammals reached Ireland during this wider period; it does not reveal exactly which route any particular herd took, or whether people travelled beside it.

The Last Glacial Maximum lay ahead, conventionally placed at about 26,500–19,000 calibrated years before present. Research on the Irish Ice Sheet shows that its exact extent and thickness varied by region and remains actively debated, especially in the south-west and on mountain summits. What is not in doubt is the transformative force of later glaciation. Ice covered much of Ireland during the maximum, reshaping landforms and greatly diminishing the chance that a lightly built Upper Palaeolithic camp would survive. That later destruction is one reason a bone assemblage in a protected cave matters so much.

The Reindeer Bone Question

Castlepook has become more significant still because a fragment of reindeer femur has been reported as bearing a deep mark made when a sharp stone tool butchered the animal. Public accounts and County Cork heritage material date the specimen to about 33,000 years ago, or around 31,000 BCE in broad calendar terms. If the mark is confirmed as anthropogenic and contemporary with the animal's death, it would be Ireland's earliest known indication of human activity, vastly earlier than the formerly accepted late-glacial evidence.

That is an important conditional statement, not a licence to announce a settled "first Irish" population. A radiocarbon determination dates the animal bone, while identifying a mark as a cut from a stone tool is a separate taphonomic judgement. Carnivore teeth, trampling, sediment movement, excavation damage and later handling can all affect bone surfaces. Nor has Castlepook produced a securely associated stone-tool assemblage, hearth, dwelling floor, burial, artwork or human skeleton of this age. Recent fieldwork has sought surviving undisturbed deposits and a firmer understanding of the cave's structure precisely because the old collection cannot answer every question alone.

The most careful conclusion is therefore modest but consequential. The reindeer femur may record the handling or butchery of an animal by people in Ireland during the Upper Palaeolithic. It does not yet demonstrate a permanent settlement at Castlepook, continuous occupation of the island, a named migration or a particular language and ancestry. The cave itself may have been principally a carnivore den or a place where scavengers deposited remains, rather than the location where the animal was killed or processed.

People, Society and Survival

If people did reach Ireland in this broad period, they would have been mobile hunter-gatherers belonging to the wider Upper Palaeolithic populations of north-west Europe. A single possible butchery trace allows only limited inferences about their knowledge. Processing a large animal with a sharp lithic edge would imply practical anatomical skill and an appreciation of useful materials: meat, hide, sinew, marrow and bone. Co-operation, warm clothing, fire and temporary shelter would have been necessary for survival in such environments, as evidence from better-preserved Upper Palaeolithic sites elsewhere in Europe makes clear. Yet none of those objects or structures has been found in Ireland from this horizon. They are general human necessities, not excavated Irish possessions.

There is no evidence for Irish political affairs, diplomacy, chiefs, warfare, territorial boundaries, religion, ritual specialists, formal learning or trade networks in 31,923 BCE. There are also no grounds for assigning the people potentially represented at Castlepook to an Aurignacian, Gravettian or other continental archaeological tradition: Ireland has not yielded diagnostic toolkits from this time. It would be

equally unwarranted to transfer famous European cave art, burials or ornaments to north Cork. The cultural achievement visible in Ireland is, for now, the survival of a fragile archaeological question rather than a developed narrative of society.

What the Record Can Sustain

Economic life, insofar as it can responsibly be discussed, was ecological rather than agricultural. There were no farms, domestic livestock, fields, pottery, metalworking or permanent villages. The country's significance lay in its changing habitats and animal populations within a wider north-west European landscape. Reindeer are the species directly involved in the possible human evidence; mammoth, giant deer and other fauna must not automatically be counted as human prey. Their bones establish presence, not hunting.

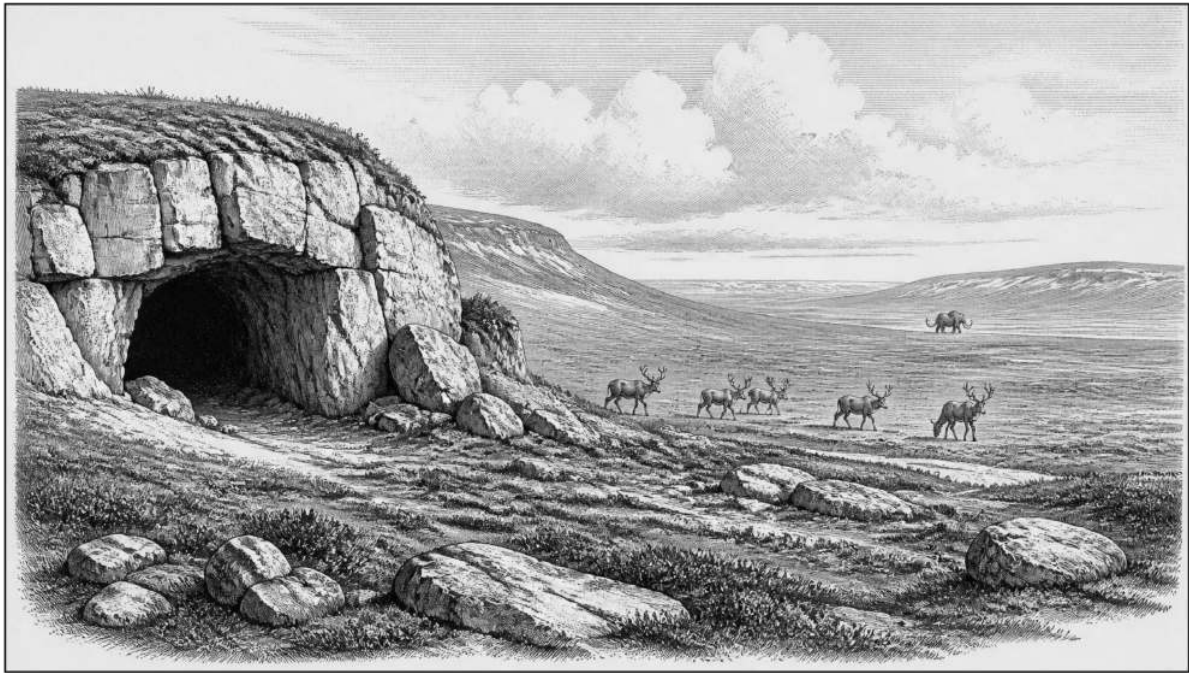
For comparison, stronger direct evidence for people in Ireland belongs much later. A butchered brown-bear bone from Alice and Gwendoline Cave in County Clare has a calibrated range of about 12,810–12,590 cal BP, roughly 10,860–10,640 BCE. That late Upper Palaeolithic evidence is valuable precisely because it rests on a more specific case, but it cannot prove what happened more than twenty millennia earlier. The gap between the sites underscores how intermittent and vulnerable the Irish record is.

Thus the Ireland of this notional year was an Ice Age landscape on the threshold of profound change: open country supporting cold-climate mammals, caves accumulating remains, and ice sheets growing towards their later maximum. Castlepook's reindeer horizon may preserve the faintest trace of people moving through that world. Whether it represents a brief visit, repeated seasonal incursions or something else remains unknown. The essential historical fact is not a year-specific episode, but the emergence of evidence that Ireland's human story may begin far earlier, and far more tentatively, than once believed.

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31922 BCE

Castlepook's Hyena Galleries^[79]



The label 31,922 BCE gives a misleading impression of precision. No community in Ireland used a calendar, writing or named era at this depth of time, and archaeology cannot identify events within a single modern year. The responsible setting is therefore a broad one: roughly 33,900 calibrated years before present (where “present” is conventionally 1950), during the Late Pleistocene and Marine Isotope Stage 3. Dates from this age are usually expressed as radiocarbon determinations and calibrated ranges, often with uncertainties measured in centuries or millennia. What can be described is not an Irish ‘year’, but an interval in which climate, ice, animals and perhaps very occasional people shaped a precarious north-western edge of Europe.

An Island in an Unstable Ice Age

Ireland was then part of the long last glacial cycle, but it should not be pictured simply as an island sealed beneath permanent ice. Marine Isotope Stage 3, broadly c. 57,000–29,000 years ago, was climatically restless. Greenland ice-core records and North Atlantic sediments reveal abrupt warmer and colder swings. The British–Irish Ice Sheet was already an important presence, but its precise extent and behaviour around 34,000 calibrated years ago remain debated. Recent synthesis points to earlier growth, retreat and renewed advance before the Last Glacial Maximum, rather than one uncomplicated march towards a frozen peak.

The maximum expansion came later, broadly between c. 27,000 and 23,000 calibrated years before present. Around the notional year in question, parts of Ireland may have experienced open, cold landscapes during favourable phases, while other areas were influenced directly by expanding ice or by its severe climatic effects. The island’s familiar modern coast is no guide to this world. Global sea level was

lower, local land levels were altered by the colossal weight of ice, and the Irish Sea region was a changing combination of shallow water, exposed ground, ice and sediment-filled basins. It is unsafe to imagine either an easy, continuous land route or a fixed sea crossing from Britain.

These changes matter because they governed which plants, animals and people could reach the island, and whether they could remain. The surviving evidence suggests that Ireland was not uniformly lifeless before the glacial maximum. Yet it does not prove that every region was habitable at the same time, or that conditions were stable enough to support a permanent human population. A cave fossil records that an animal, or material containing it, reached one place; it cannot by itself map a whole island.

The Evidence at Castlepook

The key Irish locality for this period is Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. Its limestone passages produced a remarkable collection of animal remains during excavations in the early twentieth century. Later investigation and radiocarbon redating have made the cave central to understanding Irish fauna before the Last Glacial Maximum. The old excavations were undertaken long before modern standards of stratigraphic recording, however. The assemblage comes from a complex cave system affected by natural disturbance, and bones recovered from different passages or deposits cannot casually be treated as one simultaneous scene.

Even with that warning, the faunal evidence is striking. Castlepook has yielded remains attributed to woolly mammoth, reindeer, giant deer, brown bear, spotted hyaena, wolf, Arctic fox, stoat, mountain hare and lemmings. Some finds have uncertain ages or contexts, while earlier radiocarbon results have been revised as laboratory pretreatment improved. The 2020 redating programme showed that several Castlepook specimens were substantially older than their previous determinations suggested. It placed important parts of the fauna firmly within MIS 3 and indicated that spotted hyaena and giant deer may have disappeared locally before the later glacial maximum, around 40,000 calibrated years before present.

This is evidence for a cold-adapted animal community, not a painted panorama. Reindeer and lemmings point towards open habitats unlike the densely wooded Ireland of later millennia. Mammoth, giant deer and horse known from Irish Pleistocene contexts imply patches of productive grazing country. Predators and scavengers complicate the picture: hyaenas could accumulate bones in dens, while wolves, bears, carnivores, water movement and cave collapse could all alter an assemblage. Nevertheless, the combined record makes a landscape of open grassland, herb-rich steppe-tundra and sheltered valleys more plausible than a uniform wilderness of bare snow.

For the animals, seasonality would have been decisive. Plant growth, snow cover, access to grazing and the position of ice margins changed the value of particular valleys and uplands. A herd of reindeer may have passed through rather than lived year-round near Castlepook; a carnivore den tells of feeding and shelter rather than a settled ecosystem. It is possible to say that north Cork formed part of a wider Late Pleistocene ecological zone connected, at intervals, to Britain and continental Europe. It is not possible to calculate animal numbers, chart fixed migrations, or describe a particular hunting season in 31,922 BCE.

The Reindeer Bone Question

Castlepook has particular historical importance because a reindeer femur in the National Museum of Ireland collection has been reported as bearing a mark consistent with cutting by a sharp stone tool. County Cork heritage material dates the bone approximately to 31,000 BCE and presents the mark as

evidence that Stone Age hunters butchered reindeer. If that interpretation is confirmed, it would represent a dramatic indication of human activity in Ireland far earlier than the island's well-established post-glacial settlement record.

Its significance requires equally dramatic caution. A modified animal bone may demonstrate the processing of one carcass; it does not demonstrate a village, a resident population, or a continuous occupation. No securely associated Upper Palaeolithic stone-tool assemblage, hearth, habitation surface, burial, artwork or human skeletal remains has yet established a community in Ireland around 34,000 calibrated years ago. Castlepook's nineteenth- and early twentieth-century recovery history also makes it difficult to tie every observation to an undisturbed deposit. Renewed fieldwork at the cave is valuable precisely because it may locate intact deposits and allow modern recording, dating and analysis.

The best conclusion is therefore conditional. The bone offers a plausible, officially recognised indication that people may have visited Ireland in this interval and butchered reindeer. It does not yet make permanent settlement certain. If people did arrive, they should not be called 'Irish' in an ethnic, linguistic or national sense. There is no evidence for a Gaelic language, ancestral continuity with later inhabitants, or any named group. They would have been Upper Palaeolithic hunter-gatherers operating at the far western margin of a larger European world.

People Without Polities

There were no Irish kings, tribes, provinces, laws, diplomatic missions or political institutions that can responsibly be assigned to this date. Nor does the evidence reveal warfare, alliances or territorial boundaries. The social scale most consistent with a possible hunting visit is a small, mobile party whose relationships were personal and kin-based, but even that is an inference from hunter-gatherer archaeology elsewhere rather than a fact demonstrated at Castlepook.

Upper Palaeolithic communities in other parts of Europe possessed sophisticated stone technologies, clothing, food-sharing practices, ornaments and forms of visual expression. Such evidence establishes that people of the wider period were capable of complex culture; it cannot fill the Irish record by assumption. No Irish object of this age demonstrates a particular tool-kit, dwelling design, clothing practice, artistic tradition or teaching system. If hunters processed a reindeer near Castlepook, the likely purpose was practical: meat, marrow, hide, sinew, bone and antler were valuable resources in a cold environment. But no tool from the event has been recovered, and no claim can be made about the exact method of the hunt.

There is likewise no direct Irish evidence for worship, burial custom, shrines, ceremony, music or formal learning at this time. Caves can appear inherently evocative to modern observers, but Castlepook's importance here is geological and palaeontological. Its animal bones principally illuminate ecology and taphonomy: how carcasses were accumulated, moved and preserved. To convert the cave automatically into a sacred place would be to mistake possibility for evidence.

Economy at the Edge

If humans were present, subsistence rather than trade is the only defensible economic theme. Reindeer would have been an attractive target or scavenged resource, and an open landscape could support other large herbivores. A mobile group might have followed animals, adjusted journeys to weather and used temporary shelters. Yet 'might' is essential. Ireland has no securely dated camp of this age from which archaeologists can reconstruct meals, season of residence, group size or the division of labour.

Nor is there evidence for exchange between Ireland and neighbouring regions. Potential human movement does imply some connection beyond the island: people, animals and raw materials had routes into its changing landscape. But the form of that connection is unresolved. Lower sea levels did not necessarily erase marine barriers, while ice itself could obstruct travel as much as it connected terrain. The absence of a known flint assemblage is especially important, since sourceable stone could otherwise help identify routes and contacts.

A Record Made Fragile by Ice

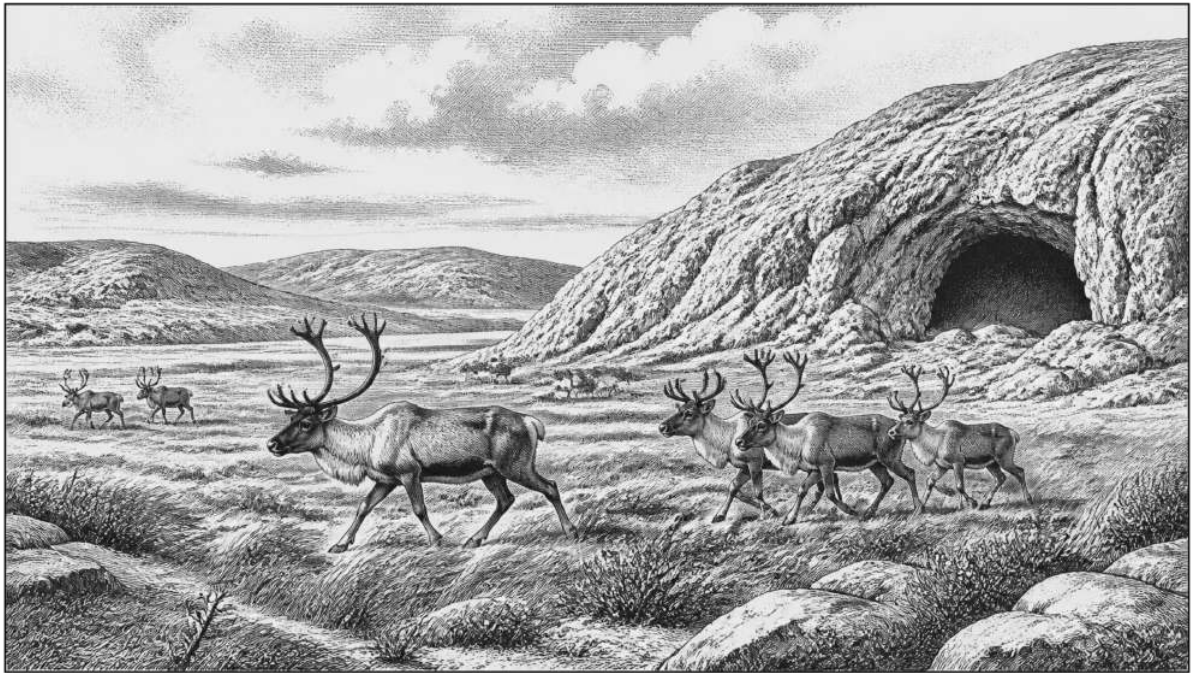
The approaching glacial maximum helps explain why the evidence is so meagre. Later ice repeatedly eroded landscapes, transported sediment and removed or buried earlier surfaces. Sea-level change drowned other potential sites on the continental shelf. Caves such as Castlepook became disproportionately important archives because their sediments and fossil collections preserved traces that open-air places often lost. Even there, preservation was selective and excavation history imperfect.

Thus the principal development around 31,922 BCE was not a datable political event but an environmental threshold. Ireland lay within a fluctuating cold-stage world in which a distinctive large-mammal fauna survived in at least some areas, while the British–Irish Ice Sheet was becoming increasingly consequential. Castlepook's hyaena galleries and reindeer bone suggest that this was not necessarily an empty island. They do not allow a fuller human history than the evidence can bear. The honest picture is compelling enough: a changing tundra-edge landscape, large animals moving through north Cork, caves used by carnivores, and the unresolved possibility that a small human party briefly entered Ireland long before settlement became archaeologically visible.

Chapter 080 of 100

31921 BCE

Castlepook's Reindeer Country ^[80]



Modern calendar notation gives the appearance of exactness that the evidence cannot sustain. No event can be assigned to “31,921 BCE”, no individual can be named, and no Irish community can be placed in that single notional year. The date falls roughly 33,870 years before the conventional 1950 reference point used by archaeologists for *BP* dating, but it is not itself a radiocarbon determination. The responsible approach is therefore to consider Ireland in the later part of Marine Isotope Stage 3, around 34,000 calibrated years BP, using date ranges rather than pretending to annual precision. This was a very remote phase of the Upper Palaeolithic world: long before farming, monuments, metalworking, writing, kingdoms or the continuous human settlement of Ireland.

A Landscape Before Full Glaciation

Ireland was entering a decisive climatic transformation. The Last Glacial Maximum, when the British–Irish Ice Sheet covered much of the island, lay ahead rather than behind: broadly, major ice expansion belongs to the period after about 34,000 years ago, with full glacial conditions developing later. Geological evidence from beneath tills in Fermanagh and from the west coast indicates that substantial areas of Ireland had been ice-free during the preceding millennia. That does not mean a mild or stable country. Temperatures fluctuated sharply, seasons were severe, and the growing ice sheet was beginning to reshape the wider region.

The Ireland of this period was not the green, wooded island familiar today. The best-supported reconstruction is of cold, largely open environments, with grassland, herb-rich steppe, tundra-like ground and patches of more sheltered vegetation varying with locality and climate. Rivers, exposed limestone,

caves and rock shelters offered routes, cover and places where bones could accumulate; they do not, by themselves, demonstrate human residence. Much of the evidence has survived only because caves protected it from later erosion, while later excavation and disturbance have made interpretation difficult.

The Castlepook Archive

The most important Irish evidence close to this broad date comes from Castlepook Cave, also called Mammoth Cave or Doneraile Cave, near Doneraile in north County Cork. It is a limestone cave system whose antiquarian excavations, particularly those directed by Richard J. Ussher in the early twentieth century, recovered a remarkable concentration of Pleistocene animal remains. Only a small proportion of the huge original collection survives, and the methods of its recovery fall far short of modern excavation standards. Nevertheless, the surviving material, much of it curated in national collections, has made Castlepook Ireland's richest known archive for vertebrate life before the Last Glacial Maximum.

Radiocarbon programmes have shown that Castlepook is not a single frozen moment. Its fauna spans a long interval, conventionally described as approximately 45,700 to 19,950 years BP, and parts of the cave were re-sorted by water, animals and earlier digging. A bone recovered beside another cannot automatically be treated as contemporary; nor can every species found in the cave be placed in 31,921 BCE. The site is valuable precisely because it reveals repeated use of a changing landscape over tens of millennia, but that longevity prevents it becoming a simple snapshot. Recent work has returned to the cave with survey, excavation and dating methods designed to locate undisturbed deposits and test older claims.

Animals in a Cold Mosaic

The Castlepook assemblage makes clear that Ireland supported a far richer large-mammal fauna before the ice sheet reached its greatest extent. Recorded remains include reindeer, brown bear, wolf, arctic fox, hare, lemming, giant deer, woolly mammoth and spotted hyaena. The latter is especially striking: Castlepook is the only Irish site known to have produced spotted-hyaena remains. Such animals belonged to food webs that included grazing and browsing herbivores, scavengers and formidable predators. Their presence is direct evidence that suitable habitats and prey existed at different points in the cave's long record.

Reindeer are particularly appropriate to the period around this nominal year. A Castlepook reindeer specimen has been discussed as dating to about 33,000 years ago, close in broad terms to 31,921 BCE, while other dated Irish cave material confirms reindeer and brown bears in pre-maximum glacial environments. Yet chronology matters: an uncalibrated radiocarbon age, a calibrated calendar range and an informal phrase such as "33,000 years ago" are not interchangeable. Changes in laboratory pretreatment and calibration have prompted reassessment of several Irish Marine Isotope Stage 3 dates. The safest conclusion is that cold-adapted and open-country fauna reached Ireland during this phase, not that every famous Ice Age animal stood together at Castlepook in one year.

The Human Question

Human presence is possible but unproven at this depth of time. A reindeer bone from Castlepook has been reported as carrying marks consistent with cutting or chopping by a stone tool, and its proposed age has encouraged the suggestion that Upper Palaeolithic hunters reached Ireland around 33,000 years ago. If

confirmed, it would move evidence of human activity on the island dramatically earlier. It would still show only an episode of animal processing, however: perhaps a brief visit by a mobile party, rather than a village, a permanent population or an ancestral nation.

The evidential threshold is high because the cave material lacks secure original context. There is no published, undisturbed Upper Palaeolithic hearth at Castlepook, no securely associated stone-tool assemblage, no dwelling floor, and no human burial from this period. Cork's archaeological heritage assessment accordingly stresses the absence of unequivocal traces of human activity among the older Castlepook collection. The 2022 research excavation was important not because it settled the question, but because it sought the stratified deposits that could do so. Evidence of a butchered brown-bear patella at Alice and Gwendoline Cave, County Clare, is much firmer, but it dates vastly later, to about 12,810–12,590 calibrated BP. It cannot be used to populate Ireland nineteen millennia earlier.

For that reason, political affairs, warfare, diplomacy and institutions cannot responsibly be reconstructed for Ireland in 31,921 BCE. There is no evidence for chiefs, territories, tribal names, languages, sacred sites, alliances or conflicts. Nor is there evidence for agriculture, herding, crops, trade networks, boats, houses or settled communities. Absence of evidence is not proof that no person ever crossed the region, but it is decisive against invented narratives of an Irish Ice Age society. The island's archaeological record supports animal movements and environmental change much more securely than human social history.

What Continental Comparisons Can—and Cannot—Do

Across north-west Europe, modern humans were established in the Upper Palaeolithic and developed sophisticated stone technologies, clothing, hunting practices, ornament traditions and artistic expression. Groups of this era were mobile and capable of exploiting seasonal resources in harsh climates. Such knowledge provides a context for the possibility of visitors to Ireland. It does not provide evidence that people at Castlepook made a particular tool type, wore particular garments, conducted rituals in the cave, or belonged to a named archaeological culture. Comparisons should explain the scale of what was possible, not fill Ireland's evidential silence with borrowed continental detail.

Geography adds another caution. Lower global sea levels during the glacial period did not necessarily create an easy, dry walking route between Ireland and Britain. Research on the Irish Sea has challenged older, simple ideas of a lasting land bridge, while acknowledging that ice, water levels and coastlines changed repeatedly. Any human arrival near 34,000 calibrated BP would therefore have involved a route not yet demonstrated by direct archaeological evidence. It should not be casually imagined as a routine overland migration.

A Future Erased by Ice

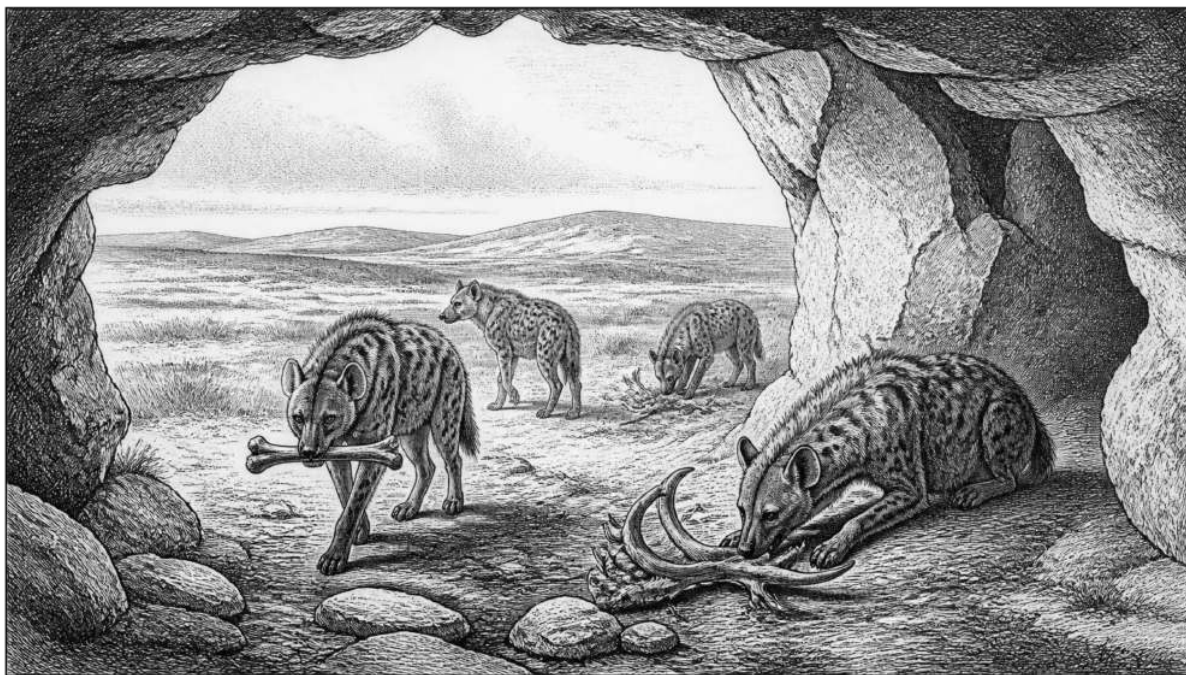
The approaching glacial maximum gives the period its historical significance. As ice expanded after the interval represented by the older Castlepook fauna, it removed or buried landscapes on which animals—and any transient people—might have travelled. Later glaciers also eroded and redistributed deposits, helping to explain why the Irish Upper Palaeolithic record is so slight. This is a reason for caution, not a licence to assume a vanished population. Archaeology must distinguish between a plausible missing record and a demonstrated past.

Around the modern label 31,921 BCE, then, Ireland is best understood as a cold and changing land with a documented Pleistocene fauna and a tantalising but unresolved question of human contact. Castlepook Cave preserves the central clue: a deep archive of reindeer country, predators and large herbivores at the threshold of extensive glaciation. Its bones illuminate an Irish environment before later ice remade the island. They do not yet permit a year-by-year history of its people.

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31920 BCE

Hyaena Land, Castlepook^[81]



The label 31,920 BCE must not be treated as the date of a recorded Irish event. No calendar, written testimony, named community or securely dated settlement allows history to be narrated at year-by-year precision this far back. Expressed simply against the conventional radiocarbon baseline of 1950, it falls about 33,870 years before present; yet that arithmetic conversion is not itself a calibrated archaeological date. The responsible setting is the Late Pleistocene, broadly Marine Isotope Stage 3 (MIS 3), when climates repeatedly altered and Ireland's evidence survives only in scattered caves, sediments and fossils. The most illuminating Irish place is Castlepook Cave near Doneraile, County Cork: not a prehistoric town or shrine, but a limestone cave whose animal remains preserve a rare glimpse of a landscape that later ice and erosion largely removed.

A Date Range, Not A Dated Year

Radiocarbon ages and calendar ages are not interchangeable. A measured radiocarbon result has to be calibrated against curves that account for past fluctuations in atmospheric carbon-14, and the uncertainties become especially important in the deep past. IntCal20 provides a Northern Hemisphere calibration framework back to 55,000 calendar years before present, but it does not turn a cave find into evidence for a particular modern-style year. Accordingly, 31,920 BCE is best used here as a point within a broad chronological neighbourhood, around 34,000 calendar years ago, rather than as a moment at which anyone can be shown to have acted in Ireland.

That distinction matters because Castlepook's remains do not form one sealed deposit made in one season or even one millennium. The cave was excavated principally between 1904 and 1918, and its deposits were disturbed by water, animals and excavation. More than 2,000 recovered bones are now recorded in the Geological Survey Ireland account, while older reports describe a much larger antiquarian

collection. Direct dates from individual specimens span a very long stretch of the Ice Age, approximately 45,700 to 19,950 years before present. Each bone can therefore illuminate the existence of a species at some point, but no complete animal list should automatically be projected on to 31,920 BCE.

The Cave's Animal Archive

Even with that warning, Castlepook is exceptionally important. Its Pleistocene fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena; later Ice Age material also includes wolf, Arctic fox and both collared and Norwegian lemmings. These are direct fossil identifications, not imaginative reconstructions. They show that, during different portions of the pre-Last Glacial Maximum period, Ireland could support a cold-stage mammal community of striking variety. Mammoth and reindeer evoke open, productive grazing ground; lemmings and Arctic fox point to severe conditions; hyaenas reveal the presence of a large predator and scavenger capable of bringing bones into sheltered places.

The hyaena is central to interpreting the cave. Many bones have been gnawed, and Castlepook has long been understood as a place to which spotted hyaenas carried carcass parts or scavenged remains. That explains why a cave assemblage is not a simple census of animals living immediately outside its entrance. A hyaena den records predation, scavenging, bone transport and repeated use of shelter. It may preserve prey that people never encountered, as well as animals that died far from the cave. In historical terms, the best image is not of a stable “Irish fauna” assembled in one place, but of episodic animal traffic through a changing region.

Re-dating has made the picture more complex and more valuable. Improved pretreatment of bone samples produced Castlepook results between roughly 5,000 and 12,000 radiocarbon years older than earlier determinations for the same site. The 2020 reassessment concluded that giant deer and spotted hyaena may have disappeared locally before about 40,000 calibrated years ago. This is an interpretation based on the revised dates, not proof that every individual species was absent from Ireland in the notional year 31,920 BCE. It does, however, make caution essential: the presence of hyaena remains at Castlepook cannot by itself demonstrate living hyaenas in County Cork at that exact calendar point.

People: A Possible Trace, Not A Population

The most consequential, and most limited, evidence concerns a reindeer femur from the Castlepook collection. Researchers have identified marks on it as consistent with stone-tool butchery, and public reporting of the research places the bone at about 33,000 years ago. If that interpretation and association are sustained, the bone indicates that humans processed an animal in Ireland during the Upper Palaeolithic, pushing evidence of human activity far earlier than the previously accepted Late Upper Palaeolithic evidence from Alice and Gwendoline Cave in County Clare. It would be a major discovery precisely because the Irish record is so sparse.

Yet a butchered bone is not evidence for permanent settlement. There is no securely associated house, hearth, lithic workshop, cemetery, art panel, tool assemblage or human DNA from Castlepook that can define a resident community at this time. Nor does the bone identify a language, ethnicity, kin group or named archaeological culture. Its original excavation context was shaped by early twentieth-century methods, and the cave's sediment history is complicated. The most that can responsibly be said is that one or more people may have reached Ireland and handled reindeer during this broad phase of the Ice Age. Whether they made a short hunting visit, used the cave itself, or belonged to a recurring seasonal movement across the wider north-west European landscape remains unknown.

Landscape Before The Ice Maximum

At around 34,000 calendar years ago, Ireland stood before the Last Glacial Maximum rather than within its fullest extent. Later research places the maximum British–Irish Ice Sheet in Irish and adjacent seas broadly around 25,000–23,000 years before present, while wider reconstructions examine ice-sheet growth and retreat from 31,000 to 15,000 years ago. Southern Ireland was not simply an unchanging white expanse throughout the entire Late Pleistocene. Evidence from south-coast raised beaches and marine sands demonstrates MIS 4–3 conditions before later glaciation; subsequent ice advance altered and, in many places, erased older landscapes.

The environment suggested by the faunal record was cold and generally open, but it should not be reduced to a featureless tundra. Reindeer, mammoth and giant deer require food; their presence implies patches of vegetation capable of sustaining large herbivores, probably within a shifting mosaic of grassland, herb-rich steppe-tundra, wet ground and more sheltered terrain. Weather, growing seasons and plant cover would have varied across centuries and millennia, particularly through the abrupt climatic oscillations characteristic of MIS 3. The low sea levels of the glacial world also made coastlines very different from those of modern Ireland. They may have reduced or rearranged sea barriers, but the precise availability of a continuous route from Britain or continental Europe at any one date cannot be assumed from the evidence now available.

No Politics, No Trade Network

There is no evidence from Ireland around this point for political authority, diplomacy, warfare between organised polities, farming, metalworking, trade routes, formal religion or literacy. Such headings belong to later prehistoric and historic societies; forcing them on to Castlepook would replace evidence with fiction. If people did reach the island, their practical economy would have depended on mobility, knowledge of animal behaviour, suitable stone tools, clothing and shelter adequate for an unstable cold climate. Those are reasonable inferences from Upper Palaeolithic life elsewhere, but they cannot be described as directly observed Irish institutions.

Equally, it would be wrong to claim either peaceful coexistence or conflict between people and carnivores. Hyaenas, wolves and bears made large carcasses and caves contested resources in an ecological sense. But Castlepook provides no incident, battle, ritual or personal story. The cave's cultural significance lies instead in its refusal to yield easy narratives. It demonstrates how much Irish prehistory has been lost, mixed or buried, while preserving enough material to show that the island was not outside the biological world of Ice Age north-west Europe.

What Can Be Said Responsibly

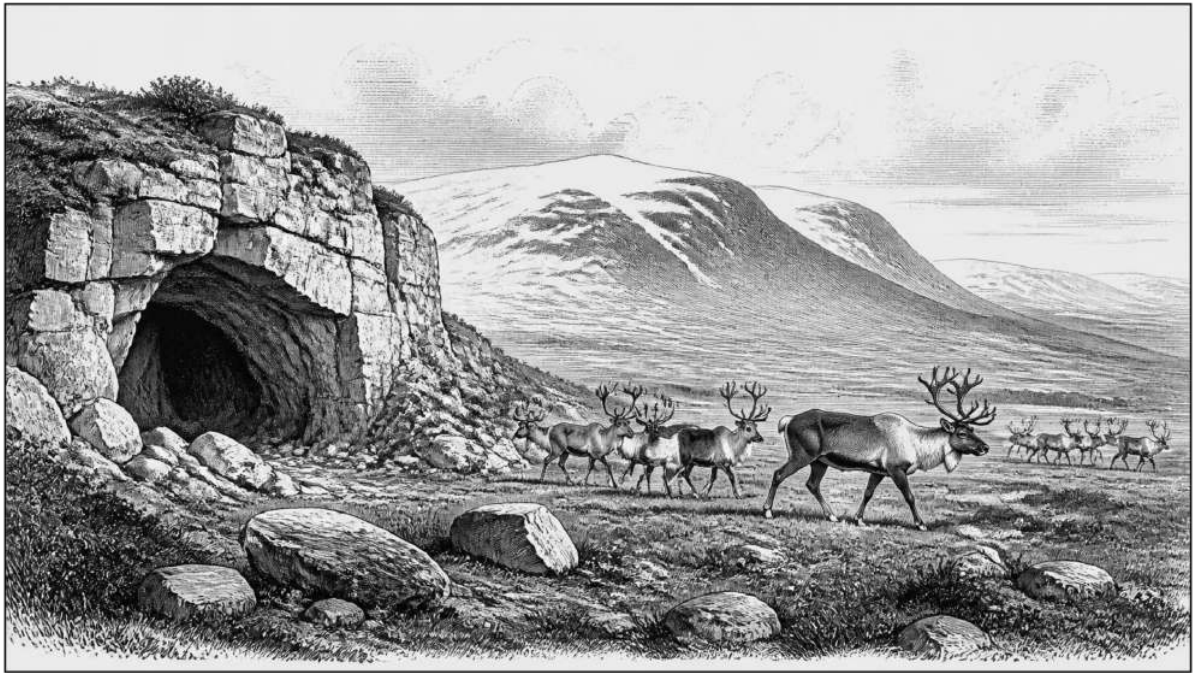
The strongest conclusion for the period represented by 31,920 BCE is environmental, not political. Parts of Ireland had, at various times in MIS 3, a cold-stage fauna including large grazers and formidable predators. Castlepook Cave in north Cork is the principal Irish archive for this evidence. A reindeer bone potentially bearing butchery marks raises the possibility of a very early human visit, but does not establish a continuous population or a year-specific occupation. The approaching growth of the British–Irish Ice Sheet would later transform the island's terrain and drastically narrow the archaeological record. New

excavations and modern re-dating programmes are therefore crucial: intact deposits, rather than old collections alone, offer the best prospect of learning whether fleeting human footprints can be separated from the deeper tracks of reindeer, mammoth and hyaena.

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31919 BCE

The Cut-Marked Reindeer^[82]



The label 31,919 BCE is a modern calendar convention, not a year for which Ireland has a recoverable historical record. No contemporary people named it, wrote about it or dated events by it. In archaeological terms it falls roughly 33,868 years before the conventional radiocarbon “present” of 1950, but that arithmetic conversion must not be confused with a calibrated scientific date. Radiocarbon and other dating methods produce ranges, often broad ones, and their results are related to particular samples rather than to an island-wide annual snapshot. The responsible description is therefore Ireland during the Late Pleistocene, within Marine Isotope Stage 3 and before the Last Glacial Maximum.

There was no Ireland in the political or cultural sense familiar from later history: no kingdoms, towns, farms, written language, churches, monuments or known burial grounds. Nor is there evidence from this horizon for diplomacy, trade networks, formal warfare or a settled population. What can be investigated is more fundamental, yet remarkable: whether the land that is now Ireland could support large mammals, whether parts of it remained free of a full ice sheet, and whether people may briefly have reached it.

A Date Beyond Annual History

The numbered year sits within a long and unstable climatic interval. The Last Glacial Maximum, when the British–Irish Ice Sheet became especially extensive, lay later, broadly between about 26,500 and 19,000 years ago. Around the earlier horizon represented by 31,919 BCE, the eventual expansion of that ice sheet was not yet complete. Geological evidence from north-central Ireland is particularly important. Organic sediments beneath later glacial deposits at Derryvree and Greenagho in County Fermanagh indicate ice-free conditions during parts of the preceding interval. One calibrated range from Derryvree spans approximately 36,900–31,700 cal BP; another from Greenagho spans about 37,200–35,700 cal BP.

Those ranges overlap a great deal of time, and neither proves that every Irish region was open ground at once. They nevertheless overturn an older, simple picture of an Ireland continuously smothered by ice before the glacial maximum. The best interpretation is regional and provisional: at least some lowland landscapes, lakes and coastal waters existed before later ice advanced, while uplands and northern or western sectors could have had very different local conditions. Subsequent glacier movement eroded, buried and rearranged evidence, making this one of the most difficult periods in Irish archaeology to reconstruct.

Castlepook's Fossil Archive

The strongest direct window on Ireland's living world is Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. Excavations in the late nineteenth and early twentieth centuries recovered a very large collection of animal remains there. Later study and radiocarbon dating by the Irish Quaternary Fauna Project showed that Irish cave collections preserve evidence for mammals over a long Late Pleistocene span, rather than a single intact occupation layer. Castlepook is consequently an archive of repeated animal use, death, scavenging and sediment movement, not a frozen scene from one day or one year.

Its fauna includes reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, hare, collared lemming and spotted hyaena. The hyaena is especially striking: Castlepook has produced Ireland's only known remains of this Ice Age predator. Chewed bones suggest that hyaenas used parts of the cave system as a den or feeding place. That is evidence of carnivore behaviour, however, not proof that all the animals listed lived together at precisely the same time. Individual specimens have dates separated by millennia; species lists must not be turned into a single, overcrowded tableau.

Still, the broad implication is clear. Before the full glacial maximum, portions of Ireland could sustain a cold-stage fauna of large grazers, browsers, scavengers and predators. Reindeer point to open, cold environments, while mammoth and giant deer testify to substantial food resources somewhere in the wider landscape. The appropriate image is not modern green pasture or continuous woodland, but a variable, exposed and seasonally demanding mosaic shaped by cold, wind, sparse vegetation, rock, water and changing ice margins. The exact proportions of grassland, herb-rich tundra, scrub and bare ground cannot be read directly from the cave bone collection alone.

The Reindeer Bone and People

Castlepook also supplies the most consequential, and most carefully qualified, possible human evidence for this early date. A reindeer femur from older excavations has been reported as bearing a cut mark consistent with the use of a sharp stone tool, and public heritage accounts place the animal at around 33,000 BCE. If that diagnosis and association withstand continuing specialist scrutiny, it would show that humans processed a reindeer in Ireland far earlier than the formerly accepted Late Upper Palaeolithic evidence from County Clare.

The distinction between evidence and interpretation matters. The physical evidence is a dated animal bone with a mark identified as compatible with butchery. The larger interpretation—that a small party of *Homo sapiens* travelled to Ireland, hunted or scavenged reindeer, butchered one carcass and then departed—is plausible, but it is not demonstrated by a camp, hearth, stone-tool assemblage, dwelling, human skeleton or repeated sequence of securely dated activity. Marks on ancient bone must be distinguished

from carnivore damage, trampling, sediment abrasion, excavation damage and later handling. Moreover, much of Castlepook's historic collection came from disturbed deposits, where the original relationships between objects were poorly recorded by modern standards.

Recent licensed investigation at Castlepook is important precisely because it addresses that weakness. The 2022 excavation sought surviving Pleistocene deposits and identified potentially useful sediments in several cave areas, but found no cultural artefacts. That negative result neither disproves the cut-mark interpretation nor establishes occupation. It underlines how little can honestly be claimed. Fresh stratigraphic excavation, micromorphology, direct dating and further faunal analysis offer the prospect of testing the older finds rather than merely repeating them.

Life at the Edge of Evidence

If people were present near this horizon, their visit was almost certainly small-scale and mobile. A group capable of reaching such a landscape would have needed detailed knowledge of animals, weather, shelter and stone-working, but Ireland currently provides no evidence from which to reconstruct kinship, leadership, language, clothing, ritual or social identity. It is unsafe to give them a tribal name, assign them an ethnicity, or treat them as ancestors of historically known Irish populations. The later disappearance of evidence during the harshest glacial conditions also means that a brief early visit should not be mistaken for continuous settlement.

Everyday life, if there was any human presence, would have centred on immediate survival: finding food, making and maintaining cutting implements, protecting bodies from cold and wet, and judging movement through a changing coastal and upland world. These are general inferences from Upper Palaeolithic lifeways elsewhere in north-west Europe, not observations made at Castlepook. There is no Irish evidence at 31,919 BCE for farming, domesticated animals, pottery, metalworking, long-distance exchange of finished goods or permanent houses. Any connection with Britain or continental Europe is similarly unproven. Lower sea levels altered the geography of the Irish Sea region, but neither a route nor the means of crossing can be specified from the available Irish evidence.

Religion and culture are even less visible. No cave art, portable art, ceremonial deposit, grave or musical instrument can securely be assigned to Ireland at this date. A cut-marked bone would be significant as evidence of subsistence technology, not of symbolic practice. The silence of the record is not proof that visiting people lacked stories, beliefs, skills or social rules; it means that such things have not survived in identifiable Irish form.

What Changed, and What Did Not

The central development around this date was environmental possibility. Ireland was not yet simply the ice-covered blank that older summaries sometimes implied. Faunal remains and buried deposits show that parts of the island or its then broader surrounding landscape supported life during a fluctuating pre-maximum glacial phase. Castlepook's animals place Ireland within wider European ecological worlds, where reindeer, mammoth, hyaena and human hunters or scavengers could, at different times, move across changing northern landscapes.

But this was no foundation year for a continuous Irish society. The evidence remains sparse, cave-bound and chronologically stretched. The clearest securely dated proof of later human activity is the butchered brown-bear patella from Alice and Gwendoline Cave in County Clare, dated to approximately

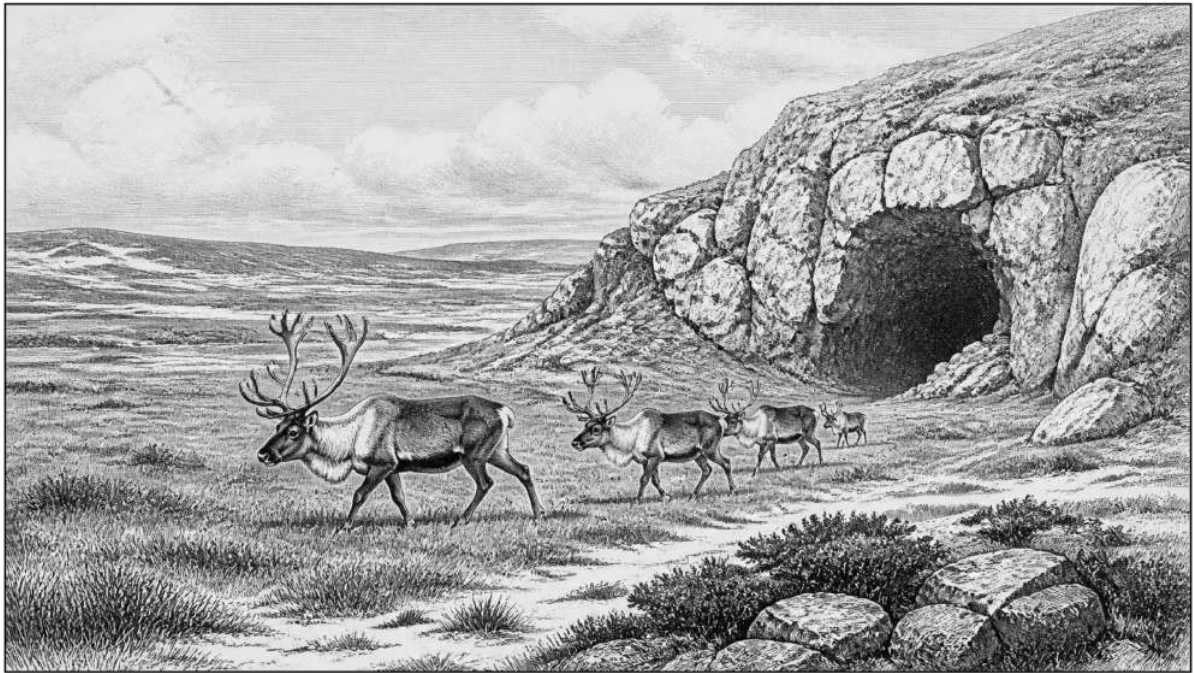
12,810–12,590 cal BP—more than twenty millennia after the period considered here. Between the possible Castlepook episode and those later traces lie severe climatic deterioration, major ice-sheet growth and an immense archaeological gap.

For 31,919 BCE, then, the responsible history of Ireland is one of a cold but intermittently habitable land, large animals, advancing climatic risk and a tantalising possible human signature. Castlepook's reindeer bone may eventually alter the beginning of Ireland's human story. At present, it is best treated not as evidence for a populated Ice Age Ireland, but as a challenging clue that makes the absence of stronger evidence all the more important.

Chapter 083 of 100

31918 BCE

Reindeer at Doneraile^[83]



The label 31,918 BCE supplies a useful point on a modern chronological scale, but it cannot identify an Irish event in the way a medieval annalistic year can. No written record, settlement sequence or archaeological layer allows historians to isolate that particular year. In this deep past, dates are expressed as calibrated ranges or broader phases, and the appropriate setting is the later part of Marine Isotope Stage 3 (MIS 3), within the Last Glacial Period. Around 34,000 calendar years ago, Ireland was entering a profound climatic deterioration that would culminate in the Last Glacial Maximum several millennia later. What can responsibly be said is therefore regional and provisional: southern Ireland contained an Ice Age fauna, caves preserved fragments of its history, and one find from County Cork raises the possibility of a very early human visit.

A Date Without a Calendar

Modern BCE notation is far more precise than the evidence permits. Radiocarbon determinations measure the remaining carbon-14 in once-living material, then must be calibrated against changing atmospheric carbon levels; their results are normally reported as probability ranges, not as a single historical date. Moreover, the relation between a date expressed in “years before present” and a BCE year is not a simple conversion. “Present” in radiocarbon convention is 1950, and calibration can widen or shift the apparent age substantially. For this reason, 31,918 BCE should be read as approximately 34,000 years ago, not as the anniversary of a known occurrence. The relevant archaeological and environmental record spans thousands of years.

This was not yet the peak of the last Irish glaciation. Synthesis of geological evidence indicates that Ireland was largely ice-free until about 32,000 years ago, after which the last Irish Ice Sheet expanded markedly. Its greatest extent came later, broadly between c. 27,000 and 23,000 calibrated years before

present, although timing varied across the island and its surrounding shelf. At the point represented by this article, then, ice, climate, sea level and habitable ground were changing rather than fixed. It is misleading to picture every part of Ireland as either a uniform white ice cap or a settled tundra plain. Conditions differed between uplands, coast, river valleys and limestone country, and the surviving evidence is uneven.

Castlepook's Cave Record

The most important Irish place for discussing this period is Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. Its passages lie in Carboniferous limestone in the Awbeg valley below the Ballyhoura Hills. Excavations undertaken in the early twentieth century recovered a striking collection of animal remains. Subsequent research, including renewed fieldwork in 2022, has stressed both the exceptional value of the site and a central difficulty: much of the old collection came from deposits disturbed by earlier excavation, cave processes and animal activity. A bone found in the same gallery as another bone need not be of the same date, and cave assemblages cannot automatically be treated as snapshots of a single living landscape.

Even with that caution, Castlepook establishes that Ireland supported a richer Pleistocene fauna than the modern island. Identified remains include reindeer, brown bear, wolf, Arctic fox, mountain hare, lemmings, giant deer, woolly mammoth and spotted hyaena. Re-dating has been especially important. Improved pretreatment of bone samples produced dates substantially older than some results obtained in the 1990s, and research suggests that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum, around 40,000 calibrated years ago. The proper conclusion is not that all these animals met in one herd at 31,918 BCE; rather, Castlepook records repeated animal presences during MIS 3 and later cold phases.

Reindeer are especially relevant to the period. Their presence indicates open, cold-adapted landscapes with sufficient grazing, not the dense woodland familiar from much later Ireland. Yet reindeer bone alone cannot reconstruct vegetation exactly, population numbers or seasonal migrations. Mammoth, hyena and lemming remains likewise show that Ireland formed part of the wider north-west European world of cold-stage animals, while leaving many local questions unanswered. Caves tend to preserve bones deposited by carnivores, animals dying in shelter, water and sediment movement, as well as people. Castlepook was therefore an animal refuge and trap for evidence before it can be confidently called a human site.

The Marked Reindeer Bone

A reindeer femur from Castlepook provides the closest possible connection between this date and human activity. Re-examination of the old collection identified deep marks interpreted as having been made on fresh bone by a sharp stone implement during butchery. Publicly reported dating placed the specimen at roughly 33,000 years ago. If the interpretation and chronological association are sustained by continuing research, it would represent the earliest known evidence of human activity in Ireland by a very large margin: not proof of a settled population, but evidence that people reached the island or its then-accessible margins during the Upper Palaeolithic.

The distinction matters. The bone is not a house floor, hearth, stone-tool assemblage, burial or camp with intact stratigraphy. It does not tell us whether the people involved were there for hours, days or a season; whether they hunted the animal, scavenged it, or merely processed part of a carcass; nor whether they returned. Nor has a named human individual, a language or a social group been recovered from

Ireland for this time. The evidence is strongest for a particular action on an animal bone, weaker for the wider setting of that action, and insufficient for a narrative of permanent colonisation. Archaeology progresses by maintaining those levels of confidence rather than collapsing them into a dramatic origin story.

That restraint is reinforced by the contrast with later evidence. At Alice and Gwendoline Cave in County Clare, a brown-bear kneecap bearing cut marks has been directly dated to approximately 12,810–12,590 calibrated years before present. It is secure evidence that people were present in Ireland in the Late Upper Palaeolithic, but it is more than twenty millennia later than the Castlepook reindeer claim. The best-supported substantial settlement record remains still later, in the Mesolithic. Thus the Cork find opens a compelling possibility of earlier visitation; it does not erase the long gaps in the Irish archaeological record.

Landscape, Movement and Survival

At this time, lowering global sea level exposed broad areas of the continental shelf around north-west Europe. That fact makes animal and human movement towards Ireland plausible, but it does not license a simple claim that a permanent dry road joined Ireland and Britain. Relative sea level depended not only on global ocean volume but also on crustal movements and the growth of nearby ice. Models and geological studies have produced different reconstructions of possible connections, while later work rejects an uncomplicated late-glacial Irish land bridge. For around 31,918 BCE, the cautious position is that the geography of the Irish Sea was different and routes may have been more practicable, but the exact route taken by any animal or person represented at Castlepook is unknown.

Climate set the terms of life. The progressive growth of the British–Irish Ice Sheet altered drainage, sea level, vegetation and the availability of feeding grounds. The later ice sheet would cover Ireland and the continental shelf almost completely, but its advance was asynchronous: some regions were engulfed earlier than others, and southern Ireland may have experienced a relatively short interval of full glacial occupation. For mobile herbivores and their predators, such environmental change would have shaped movement and local extinction. For any human party, it would have made Ireland a demanding northern frontier: exposed, seasonal and uncertain, rather than an empty stage waiting for history to begin.

What Cannot Be Reconstructed

There is no evidence from Ireland around this point for political institutions, chiefs, territorial kingdoms, warfare, treaties or diplomacy. Equally, there is no basis for identifying trade networks, currencies, farming, villages, religious monuments, formal burials, art or systems of learning. These absences are not evidence that Ice Age people lacked social relationships, beliefs, skill or language; Upper Palaeolithic communities elsewhere in Europe certainly possessed complex social and cultural lives. They are statements about the Irish record. A single modified bone cannot reveal a hierarchy, a ritual or an economy.

Some modest inferences remain reasonable. The person or people who made the Castlepook marks, if the human interpretation is confirmed, possessed a cutting implement of stone and the practical knowledge to use it on a large animal. Processing meat, hide, sinew or bone would have been valuable in a cold environment. Such work need not have occurred deep inside the cave: the discarded portion may

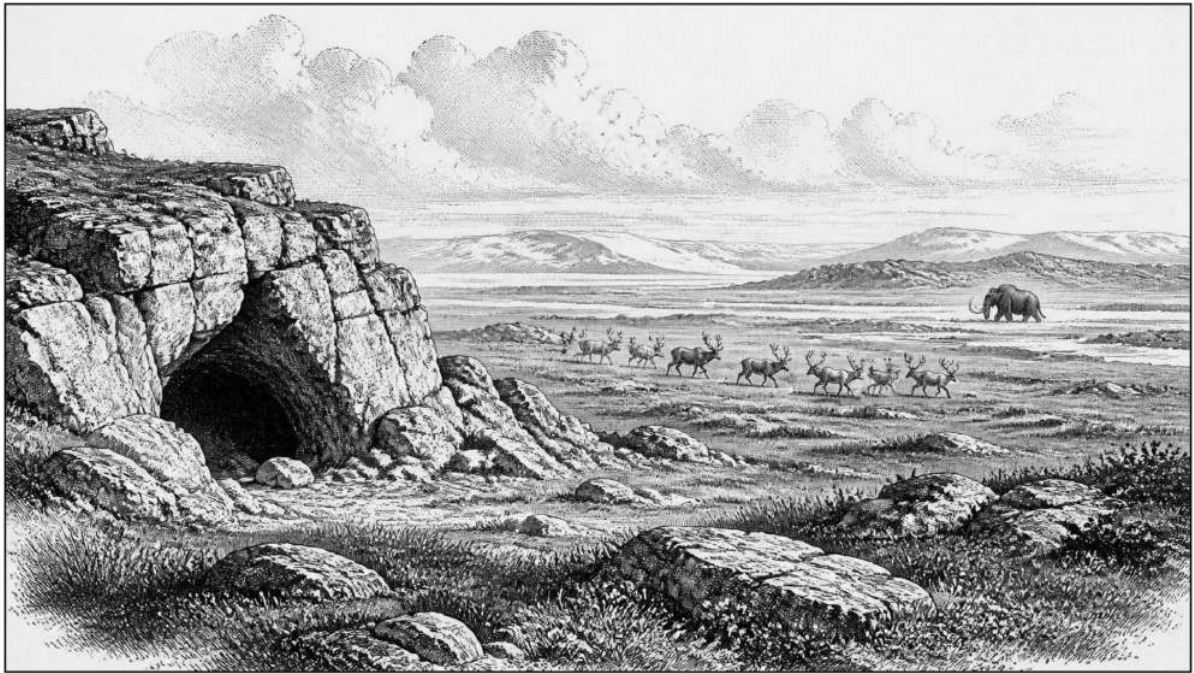
have entered it later through scavenging or natural movement. The cave's ancient deposits are evidence of a changing ecological zone, while the marked femur may be evidence of a fleeting human encounter within it. The difference between those two propositions should remain visible.

Ireland around 31,918 BCE is therefore not a year of kings, monuments or recorded battles. It is a horizon of evidence preserved in limestone: reindeer moving through cold open country, predators and scavengers using caves, and an old bone from Doneraile carrying marks that may place human hands at the western edge of Ice Age Europe. Future excavation, direct dating and taphonomic study may refine, confirm or revise that picture. For now, its historical importance lies precisely in its fragility: the possibility of an early human visit, set against a landscape about to be transformed by expanding ice.

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31917 BCE

Castlepook Cave Assemblage^[84]



The label “31,917 BCE” is useful for filing this article, but it must not be mistaken for a date that people or animals in prehistoric Ireland could have recognised. No written calendar, event record or year-by-year chronology survives from this depth of time. In archaeological terms, the point corresponds only broadly to about 33,900 calendar years before present, conventionally counted from 1950, during Marine Isotope Stage 3 (MIS 3) of the last glacial cycle. Even that translation is an approximation: radiocarbon results require calibration and normally yield ranges rather than a single modern calendar year.

What can responsibly be said is that Ireland stood close to a major environmental threshold. Evidence suggests that much of the island was still ice-free until roughly 32,000 years ago, before the final expansion of the Irish Ice Sheet towards its Last Glacial Maximum. Conditions were cold, unstable and regionally varied, but Ireland was not yet simply the featureless ice-covered land often imagined in popular accounts. Its best evidence comes not from settlements, monuments or graves, but from cave deposits, animal bones, glacial sediments and later scientific re-examination of old museum collections.

Dating a Deep Landscape

For this period, precision is necessarily limited. Radiocarbon laboratories measure the remaining radioactive carbon in once-living material, such as bone collagen. The result is expressed in radiocarbon years before present, not in BCE. Atmospheric carbon levels changed over millennia, so those results must be compared with calibration curves assembled from independently dated records, including tree rings, corals, cave deposits and lake sediments. At nearly 34,000 years ago, calibrated ranges can be broad, and revisions to methods or samples can alter previous conclusions.

This matters especially in Ireland because many significant cave collections were excavated between the late nineteenth and early twentieth centuries. Their excavators recovered remarkable bones but did not record layers, locations and associations to standards expected today. A bone may be reliably identified and dated, yet have an uncertain route into a cave: an animal may have died nearby, been dragged in by a predator, been washed or disturbed within sediments, or been moved during excavation. Archaeologists therefore separate the date of an animal's death from the date, if any, of human activity upon it.

Modern calendar-year certainty is unavailable for 31,917 BCE. The most defensible language is consequently “around 34,000 years ago”, “in the later part of MIS 3”, or “before the Last Glacial Maximum”, rather than an assertion that a particular episode occurred in this exact year. That caution is not a weakness in the history; it is the central fact of an exceptionally sparse archive.

A Pre-Maximum Ice Age

MIS 3 was a glacial age, but it was not climatically uniform. Across the North Atlantic world it included abrupt shifts between relatively milder interstadial phases and colder stadials. Ireland's position at the western edge of Europe made it sensitive to changes in Atlantic circulation, snowfall, temperature and sea level. The evidence for the last Irish Ice Sheet indicates a complicated, asynchronous growth rather than an island-wide freezing event occurring everywhere at once. Around this article's broad horizon, glaciers and upland ice were important parts of the landscape, but the full maximum ice cover lay ahead.

Lower global sea levels altered the surrounding geography, exposing areas now beneath the Irish and Celtic Seas. That does not licence a simple picture of a broad, dependable land bridge to Britain or continental Europe. Ice, sea channels, coasts and terrain changed through time, while the physical route available to animals or people remains uncertain for any particular millennium. What is clear is that Ireland was less geographically isolated than it would become after later sea-level rise, and that animals reached it during pre-maximum phases of the Ice Age.

The Irish landscape would have been open and demanding. Extensive forest is unlikely in the coldest settings; instead, grassland, herb-rich tundra, shrub vegetation and patches of more sheltered habitat probably formed a variable mosaic. Such environments could support grazing mammals, but seasonal weather, snow cover, exposed ground and advancing ice would have made resources unpredictable. The familiar modern pattern of enclosed fields, dense woodland and settled villages was unimaginably far in the future.

The Castlepook Evidence

Castlepook Cave, near Doneraile in north County Cork, is the key Irish site for this period. Excavated principally by Richard J. Ussher in the early twentieth century, it produced an unusually rich collection of Pleistocene vertebrate remains. Subsequent dating and reassessment have shown that its deposits contain material of differing ages, including a substantial pre-Last Glacial Maximum fauna. It is not a preserved snapshot of one season or one community; rather, it is a time-depth archive assembled through animal activity, cave processes and early excavation.

The fauna associated with Castlepook and comparable southern Irish cave finds demonstrates that Ireland supported a striking range of Ice Age mammals. Remains include woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. The animals should not be imagined as all standing together on one day. Their dated remains span long periods, and

each species had its own ecological requirements. Nevertheless, their presence establishes that parts of Ireland were capable of sustaining grazing animals and predators during phases before the ice sheet reached its greatest extent.

Spotted hyaena is particularly revealing. Its bones and other traces indicate carnivore use of caves and warn against treating every bone as the residue of human hunting. Hyaenas could carry carcass parts into underground shelters, gnaw bones and disturb deposits. Brown bears, wolves and other scavengers also complicate interpretation. Cave assemblages preserve food webs, but not a straightforward prehistoric larder.

The large herbivores point to open country with substantial forage. Reindeer are strongly associated with cool, open environments; mammoths required broad feeding ranges; giant deer browsed and grazed within changing mosaics of vegetation. Their occurrence makes a picture of entirely barren Ireland untenable. Yet fossil evidence cannot tell us the density of herds, the exact season represented, or how continuously any species occupied the island. Absence of a fossil is likewise not proof that an animal was absent from all Ireland.

A Reindeer Bone and Human Possibility

The most arresting claim relevant to this horizon concerns a reindeer bone from Castlepook reported as bearing marks consistent with stone-tool butchery and as dating to about 33,000 years ago. If the modification is confirmed as anthropogenic, it would be evidence that a person handled, and perhaps processed, a reindeer carcass in Ireland during the Upper Palaeolithic far earlier than the island's previously accepted human record. It would be an important addition to Irish prehistory.

It is not, however, evidence for a settled population in 31,917 BCE. The bone derives from an old collection rather than a modern excavation of an undisturbed occupation floor. No securely associated hearth, stone-tool assemblage, dwelling, burial or human skeleton establishes a camp at Castlepook in this period. Nor can one marked bone identify a language, named people, migration route or cultural tradition. The most cautious interpretation is a possible brief human encounter with an animal carcass, not a demonstrated colony.

This distinction is vital. Cut marks are assessed by their shape, position and relation to anatomy, but marks on bone may also be confused with carnivore damage, trampling, sediment abrasion, excavation damage or later handling. The claim deserves continued study alongside fresh fieldwork and direct dating. It should neither be dismissed merely because it is inconvenient nor inflated into a story of permanent "first settlers".

No Politics, No Proven Communities

There is no evidence from Ireland around this point for political institutions, rulers, diplomacy, warfare, religious monuments, formal learning, markets or long-distance trade. Terms such as kingdom, tribe, chiefdom or nation would impose later social forms on a record that cannot sustain them. Nor is there evidence for houses, farms, cultivated crops, domestic livestock or burial rites. Agriculture would not arrive in Ireland for many tens of thousands of years.

If people did reach the island, they may have travelled in very small, mobile hunting groups whose social life left little durable material trace. That is an inference from wider Upper Palaeolithic archaeology, not a demonstrated fact for Ireland. Continental and British communities of this broad era

made sophisticated stone and organic tools, organised hunting, used pigments and sometimes produced striking art. None of that can presently be assigned to Ireland at Castlepook's pre-maximum horizon. Irish evidence supports the possibility of an encounter, not a reconstruction of its participants' culture.

An Archive of Survival

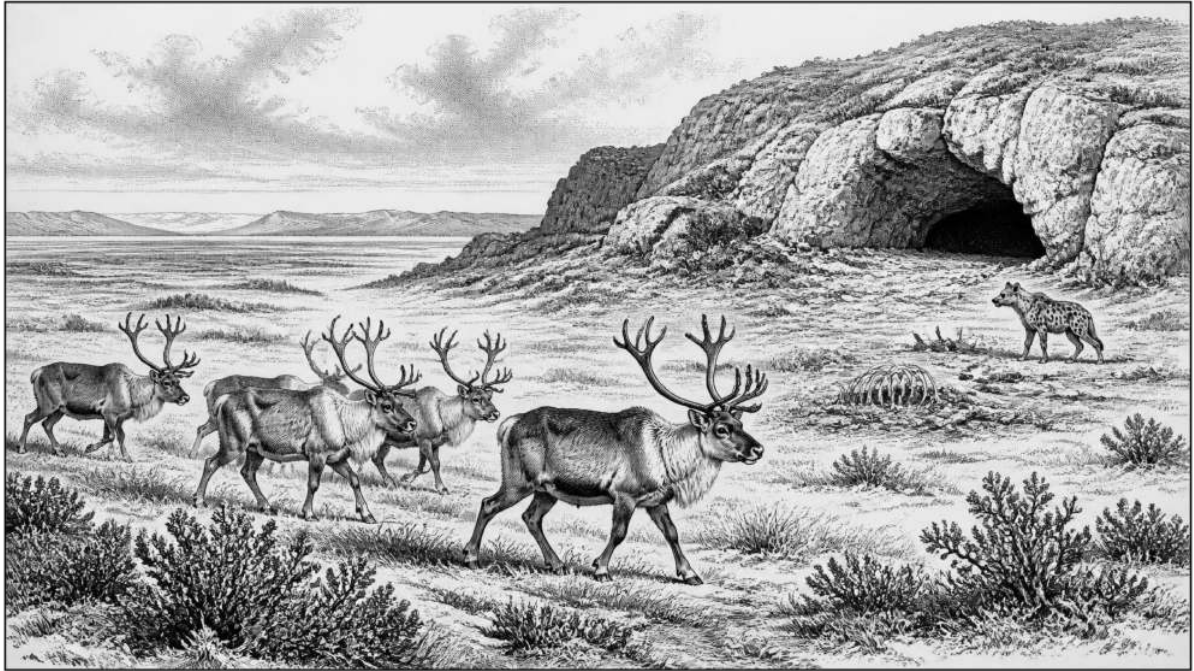
The importance of this period lies in the correction it offers to a simplified national origin story. Ireland was not yet an empty stage awaiting the Mesolithic settlers of the early Holocene, although those later communities provide the first clear evidence for sustained human occupation. Before the Last Glacial Maximum, southern cave deposits preserve a world of mammoths, reindeer, predators and perhaps an exceptionally early human visit. Soon afterwards, growing ice would transform or erase many accessible landscapes and make the archaeological record still harder to recover.

For 31,917 BCE, then, the responsible history is environmental and evidential. Ireland was part of the far north-western theatre of an unstable Ice Age: a place where animal populations moved through open cold landscapes, cave mouths accumulated bone, and human presence remains a significant but unresolved possibility. The surviving material does not yield a dated event. It does reveal a living landscape on the eve of much harsher glaciation, and a question that future archaeology may yet answer more securely.

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31916 BCE

The Doneraile Tundra^[85]



Modern calendar-year precision is not available for Ireland in 31,916 BCE. This label is a retrospective conversion, placing the point in question roughly 33,865 years before the conventional radiocarbon “present” of AD 1950, but neither people nor animals left evidence that can be assigned to that single year. The responsible frame is therefore a broad one: later Marine Isotope Stage 3 (MIS 3), during the Last Glacial Period and before the Last Glacial Maximum, when climatic conditions were unstable and Ireland supported at least intermittent populations of cold-adapted mammals. Radiocarbon results must themselves be calibrated into calendar ranges, and those ranges can be wide at this antiquity.

A Landscape Before the Maximum Ice

At this date Ireland was not the wooded, temperate island familiar today. It belonged to a northern Atlantic world repeatedly reshaped by cold, changing sea levels, snowfields, frozen ground and advancing ice. The great expansion of the British–Irish Ice Sheet lay ahead: the best large-scale reconstruction places its maximum volume at about 23,000 years ago, while Irish evidence shows that ice cover and its limits varied substantially from region to region. Consequently, 31,916 BCE should not be pictured as a moment when all Ireland lay sealed under one uniform ice sheet. It was instead part of a long pre-maximum cold phase in which habitats could alter dramatically over centuries and millennia.

The vegetation cannot be reconstructed field by field for this particular date. Later Irish pollen sequences demonstrate how difficult it is to separate local vegetation from pollen carried long distances in cold, open environments; direct plant records of this age are scarce. Yet the animal evidence indicates a largely treeless or sparsely vegetated mosaic in southern Ireland, with grasses, herbs, dwarf shrubs and

exposed mineral ground more plausible than closed forest. Such country could sustain grazing mammals and the predators and scavengers that followed them. Seasonal contrasts were probably severe, with wind, frost and limited shelter governing where animals could feed and where any people might travel.

Castlepook's Deep Archive

The most important Irish place for approaching this distant period is Castlepook Cave, near Doneraile in north County Cork. Excavated principally in the early twentieth century, it is a limestone cave system whose deposits and stored collections preserve the richest known Irish assemblage of pre-Last Glacial Maximum vertebrate remains. The original investigators recovered a remarkable quantity of bone, but their work preceded modern excavation standards. Later dating and re-examination have therefore been indispensable, while also showing that material from different episodes could be mixed or moved by water, animals and excavation. Castlepook is invaluable evidence, but it is not a neatly sealed snapshot of one camp, one hunt or one year.

Its fauna makes the scale of environmental change tangible. Castlepook has yielded remains attributed to woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Not every species need have lived there together, and none should automatically be placed in 31,916 BCE simply because its bones came from the cave. The assemblage accumulated over a very long span. Nevertheless, modern redating has strengthened the conclusion that several southern Irish cave animals belonged to MIS 3, well before the Last Glacial Maximum. In particular, revised dates have made some Castlepook specimens thousands of radiocarbon years older than earlier determinations suggested.

The cave was above all a carnivore-den and bone-accumulation site, rather than a proven human dwelling. Early investigators observed that reindeer remains were especially numerous and reasoned that carcasses or limbs had been dragged underground by large carnivores. Hyaena remains and evidence of their feeding are especially significant: the animal was not simply passing through an empty wilderness, but was part of a predator community capable of transporting and modifying bone. Mammoth remains likewise reveal that exceptionally large herbivores reached Ireland during favourable phases, though their presence says nothing about a resident human population. A cave's darkness and protection make it good at preserving bones, but poor at preserving an uncomplicated story of how each bone arrived.

The Question of People

The possibility of human activity gives this date its special interest, but it must be expressed cautiously. A reindeer femur from Castlepook has been presented as bearing a mark made by a sharp stone tool during butchery and has been associated in heritage interpretation with about 31,000 BCE. If that identification, date and association are sustained by further study, it would indicate that Upper Palaeolithic people reached Ireland far earlier than the traditionally accepted late-glacial evidence. It would be an important trace of contact with a hunted animal, not evidence for an established nation, tribe or permanent settlement.

The limits are as important as the possibility. No securely associated stone-tool assemblage, hearth, house floor, burial, human bone, artwork or repeated occupation horizon has yet demonstrated a community living at Castlepook in the thirty-second millennium BCE. The relevant cave deposits have a complex history, and the reported modification occurs on an animal bone rather than within an undisturbed human activity area. It is therefore sounder to say that a human visit or brief episode of carcass processing is possible, perhaps even plausible, than to announce an Irish population at this date.

The archaeological priority is not to enlarge a dramatic claim, but to recover stratified deposits and independently test it. Recent project work has indeed sought undisturbed Pleistocene deposits in parts of the cave left unexplored by earlier investigators.

Life Without a Recorded Society

If people did enter Ireland during this phase, their lives would have been mobile, small-scale and dependent on knowledge of animal movements, weather, fuel, shelter and safe routes. Reindeer are the strongest candidate for a humanly modified animal at Castlepook, so it is reasonable to see a reindeer carcass as the focus of the evidence. It is not reasonable to specify a hunting party's size, sex, language, ritual or equipment. Nor can the evidence distinguish confidently between deliberate hunting, scavenging, butchery elsewhere followed by carnivore transport, or a sequence involving more than one agent. The cut-mark interpretation points towards tool use; it does not reveal the entire social world behind it.

Accordingly, there is no evidence for political affairs, diplomacy, chiefs, territorial borders or organised warfare in Ireland at this point. Such concepts require human communities and relationships that archaeology has not identified. Conflict visible in the record is ecological: hyaenas, wolves and humans, if present, would have competed in different ways for access to large-animal carcasses. That is not a prehistoric version of later Irish political rivalry. It is a reminder that food, safety and movement in a cold open landscape were shaped by other predators as well as by climate.

Economy and trade are equally beyond the evidence. There are no recognised workshops, exchange goods, boats, imported ornaments or storage facilities from Ireland around 31,916 BCE. A travelling group could have carried stone tools and other perishable gear, but none is presently recovered from a secure context of this age. The altered coastlines and lower global sea levels of the glacial world may have changed routes between Ireland, Britain and continental Europe, yet the precise means by which mammals—or any visitors—reached Ireland remain unsettled. A land bridge should not be assumed merely because the sea was lower.

Religion, Culture and Learning

No Irish evidence permits a statement about religion in 31,916 BCE. Caves elsewhere in Upper Palaeolithic Europe can preserve art, burials, ornaments and structured deposits, but Castlepook has not supplied comparable material. It would be misleading to transfer the cave paintings, ceremonial practices or named cultural groups of France, Spain or central Europe directly to Cork. The absence of such evidence is not proof that visiting people lacked beliefs or stories; it means that these cannot be recovered here. The same restraint applies to language, music, kinship and formal learning. Ireland's record at this depth is palaeontological first and archaeological only in the most tentative sense.

There was, however, one form of learning that can responsibly be inferred if people were present: practical environmental knowledge. Surviving in a cold landscape required close attention to animal behaviour and terrain. The apparent butchery trace, if accepted, implies familiarity with sharp-edged stone technology and animal anatomy. Beyond that modest inference, the evidence falls silent. There is no basis for calling Castlepook a ceremonial cave, a settled hunting station or the home of a distinctive Irish culture.

An Incomplete Beginning

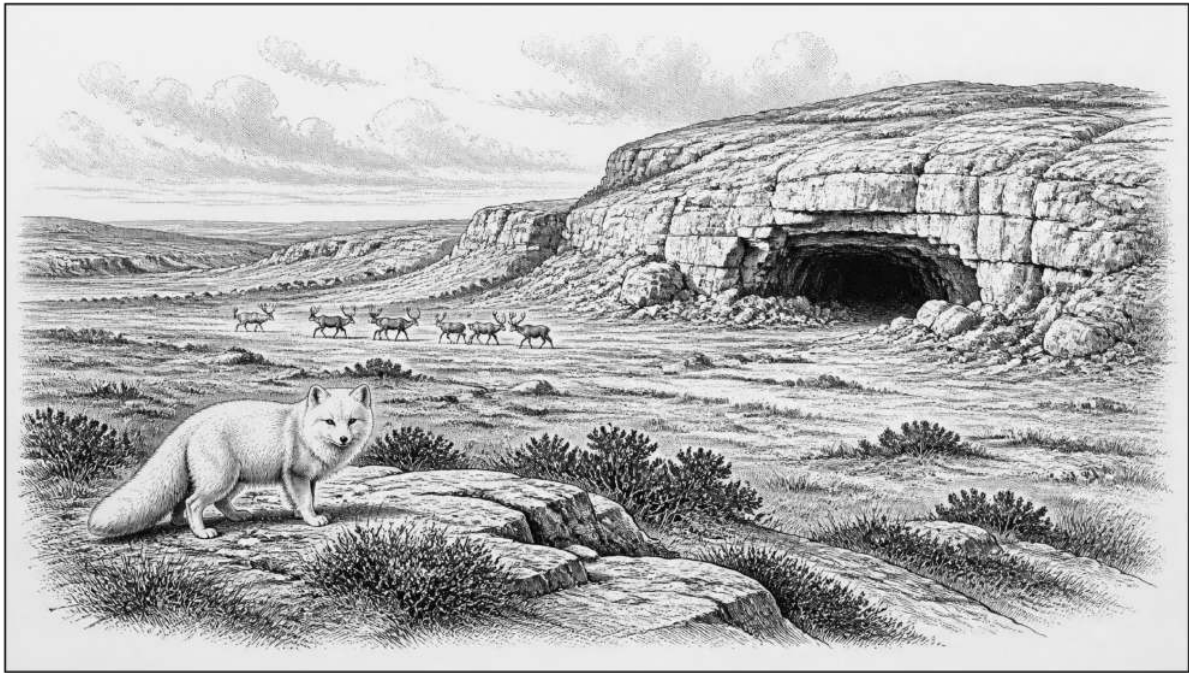
The greatest development relevant to Ireland around 31,916 BCE was not a datable political event but the existence of a pre-maximum Ice Age ecosystem, represented most vividly by the Castlepook assemblage. Its mammoths, hyaenas, reindeer and other animals overturn the older image of Ireland as wholly empty before the last ice peak. Yet they also demonstrate why certainty is difficult: the record consists of bones accumulated over long periods, often excavated before modern methods and later subjected to revised scientific dating. The Doneraile landscape was real; its exact human history remains unresolved.

That uncertainty is productive rather than disappointing. Re-dating, zooarchaeology, microscopic study of surface marks, sediment analysis and carefully controlled excavation can each revise the picture. For now, the most defensible account is deliberately modest: around this modernly numbered year, parts of Ireland could support cold-climate mammals; Castlepook preserves crucial evidence of that world; and one contested but important reindeer bone raises the possibility that people briefly entered it. The evidence does not yet allow more than that.

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31915 BCE

Castlepook's Marked Reindeer Femur Revisited^[86]



Modern calendar-year precision is not available for Ireland in 31,915 BCE. The number is a useful point on a modern timeline, not a date at which archaeology can identify an Irish event, ruler, battle or settlement. In archaeological terms it lies roughly 33,865 years before AD 1950 and belongs broadly within Marine Isotope Stage 3, an unstable phase of the Late Pleistocene. Dates from this depth of time are normally expressed as calibrated ranges, and the conversion of radiocarbon measurements into calendar years carries substantial uncertainty. The responsible question is therefore not what happened in Ireland in one numbered year, but what evidence can illuminate the island and its inhabitants—animal and perhaps human—within the surrounding millennia.

A Landscape Before Maximum Glaciation

Ireland was then in the last Ice Age, but not yet necessarily in the uniform, ice-covered condition popularly imagined for the whole period. The major expansion of the British–Irish Ice Sheet towards its later maximum was approaching and did not occur everywhere at precisely the same time. Reconstructions of the ice sheet show asynchronous growth and advance across Ireland, Britain and the continental shelf. Around this date, conditions could alter sharply over comparatively short geological intervals as North Atlantic climate switched between colder stadials and less severe interstadials. Any picture of a fixed, timeless frozen Ireland is therefore misleading.

The surviving evidence suggests an exposed, cold landscape capable at times of supporting large grazing animals and their predators. It was not the wooded island familiar today. Tree cover would have been very limited; open herb-rich grassland, tundra-like vegetation, bare ground and low shrubs are better analogies, though the exact mixture varied with temperature, moisture, soil and exposure. Rivers flowed through landscapes later reshaped or removed by advancing ice. Sea level was much lower globally than

today, changing coastlines and narrowing some water crossings, but the precise geography of routes between Ireland and Britain remains debated. Neither a simple permanent land bridge nor an effortless overland approach should be assumed.

Castlepook's Long Archive

The principal Irish evidence relevant to this distant period comes from limestone caves, above all Castlepook Cave near Doneraile in north County Cork. Caves protected bone better than most open-air Irish settings and preserved a remarkable, if difficult, record assembled across many thousands of years. Earlier excavations recovered remains attributed to woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. This is an exceptional fauna for Ireland, but it must not be turned into a single scene. A cave deposit can mix material introduced at different times by carnivores, water, sediment movement and earlier excavation.

Modern radiocarbon work has made that warning especially important. The Irish Quaternary Fauna Project and later re-dating showed that some older determinations needed revision and that individual Castlepook bones belong to distinct phases. The cave's Middle-to-Late Pleistocene assemblage records animal presence over a long span rather than proving that every listed species lived together in 31,915 BCE. Nevertheless, the assemblage firmly establishes that parts of pre-maximum-glaciation Ireland supported a far richer large-mammal community than later Ice Age and post-glacial Ireland. Its bones provide direct evidence of animals; the wider environmental reconstruction remains an interpretation built from species, dating, sediment and comparison with better-preserved continental records.

Reindeer, Predators and Carcasses

Reindeer are central to this reconstruction. Their presence indicates a cold-adapted grazing animal able to use open country, while lemmings and Arctic fox point towards harsh northern conditions. Mammoth and giant deer evoke an ecosystem with substantial plant resources, although their finds need not represent large resident herds on every occasion. Wolves and hyaenas reveal another reality: carcasses were contested resources. Spotted hyaenas are particularly significant because Castlepook is Ireland's key recorded locality for them. Gnawing, breakage and the accumulation of bones may reflect carnivore denning, scavenging and transport into the cave rather than deaths where the animals were first killed.

This distinction changes how the evidence should be read. An animal bone in Castlepook proves that the animal, or part of it, reached the cave; it does not automatically identify a hunting ground, a population size or a season. Carnivores could carry limbs and skulls from elsewhere. Water and collapsing sediments could redistribute them afterwards. Yet the scale and variety of the collection show that Ireland was not biologically empty in this phase. It formed part of a north-west European world in which animal populations moved, expanded and contracted as climate and ice margins changed.

A Single Mark and a Larger Question

The most intriguing possible human trace is a reindeer femur from Castlepook reported to bear a sharp cut mark and to date to roughly 33,000 radiocarbon years before present. Its calendar-age equivalent is appreciably older than the radiocarbon number itself and should be expressed through a calibrated range rather than assigned to a precise BCE year. The mark has been interpreted as evidence that a hominin used a stone tool while butchering the animal. If that interpretation is sustained by microscopic

analysis, secure dating and further contextual work, it would push evidence for human activity in Ireland dramatically earlier than the better-known Late Upper Palaeolithic bear-bone evidence from Alice and Gwendoline Cave in County Clare, dated to about 12,800–12,590 calibrated years before present.

For now, however, the Castlepook femur is best treated as important proposed evidence, not as proof of a settled Irish population. A single modified bone cannot tell us whether people lived nearby, came on a brief hunting excursion, travelled as a small family group or repeatedly visited the island. Nor does it identify the maker with certainty. Modern humans were widespread in parts of Europe at this time, but Ireland has yielded no human bone, unequivocal stone-tool assemblage, hearth, dwelling floor or securely excavated camp of comparable age. The original cave collections also lack the fine stratigraphic context expected from modern excavation. Ongoing work at Castlepook aims precisely to recover surviving deposits and test these questions with improved dating, taphonomy and biomolecular methods.

No Politics, No Proven Religion

Political affairs, diplomacy and organised warfare cannot responsibly be reconstructed for Ireland at this date. There are no named peoples, territories, chiefs, formal institutions or written sources. Even the existence of a continuous human community is unproven. It would be anachronistic to project later Irish kingdoms, ethnic labels, Celtic languages or Gaelic traditions back into the Pleistocene. The same limit applies to religion, art, learning and social rank. Ireland has no securely dated shrine, grave, image, ceremonial deposit or teaching tradition from around 31,915 BCE.

That absence is meaningful, but it is not evidence that visitors, if present, lacked language, kinship, ritual or knowledge. Mobile Upper Palaeolithic groups elsewhere in Europe possessed sophisticated stone technologies, social networks, symbolic practices and detailed ecological understanding. Such comparisons show what was possible, not what has been demonstrated in Ireland. The cautious conclusion is narrower: the Irish record has not yet preserved—or identified—material evidence sufficient to describe those dimensions of life here.

Subsistence Without an Economy

There is likewise no evidence for farming, herding, villages, metalworking, exchange systems or regular trade in Ireland at this time. If the modified reindeer femur represents human butchery, it implies only the immediate handling of animal food and perhaps hide, sinew, marrow or bone. Reindeer hunting could have offered a portable and valuable resource to highly mobile people, but a single bone cannot prove a specialised hunting economy. The cave fauna itself may owe more to hyaenas and other natural processes than to people.

What can be said is that survival in such a landscape required acute practical knowledge: reading animal movement, finding shelter, managing cold and obtaining food across a seasonally demanding terrain. Whether that knowledge was exercised by humans in Ireland, and how often, remains the outstanding problem. The evidence is stronger for an Ice Age ecosystem than for an Ice Age society.

The Approaching Transformation

The long-term significance of this period lies in what followed. Ice-sheet growth and advance would later overwhelm or radically alter much of Ireland, eroding landscapes and making the archaeological record exceptionally fragmentary. That subsequent destruction helps explain why caves and old museum

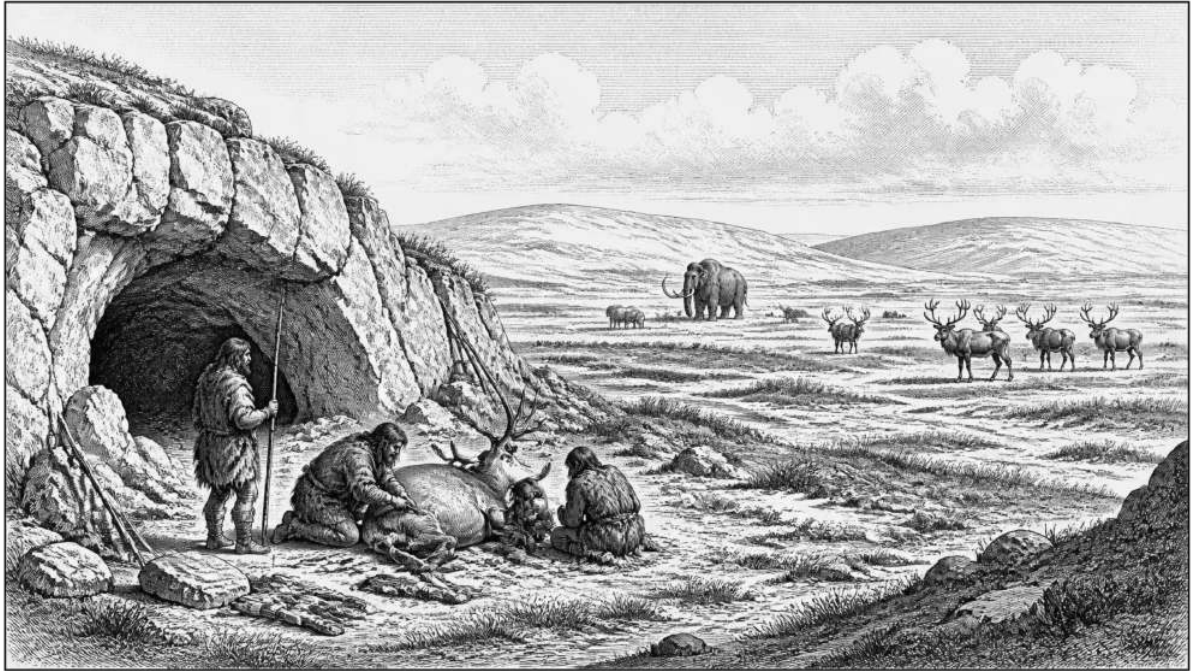
collections matter so much. They are not complete histories, but rare survivals from a world otherwise largely lost. Later deglaciation would create entirely different conditions for animals and eventually for demonstrable human settlement.

Thus Ireland around 31,915 BCE is best understood through Castlepook's reindeer femur and its wider cave fauna: evidence of a cold, changeable island landscape inhabited by large mammals and formidable carnivores, with a tantalising but still limited indication of human action. The mark on one bone invites a major revision of Ireland's earliest human story. It does not yet licence a populated prehistoric Ireland, let alone a year-by-year narrative of its people. In this case, historical honesty lies in preserving the scale of both the discovery and the uncertainty.

Chapter 087 of 100

31914 BCE

Doneraile's Mammoth Cave^[87]



The numbered year 31,914 BCE cannot be treated as a date at which a recorded Irish event occurred. No written source, annually resolved archaeological sequence or human calendar reaches remotely so far into Ireland's past. It is best understood as a modern point within the Late Pleistocene, approximately 33,860 calendar years before AD 1950, in Marine Isotope Stage 3 (MIS 3), a climatically unstable interval of the last Ice Age. The responsible question is therefore not what happened in one exact year, but what evidence can illuminate Ireland broadly around this time.

The answer is striking but limited. Ireland was inhabited by Ice Age animals and had not yet entered the fullest phase of the Last Glacial Maximum, when the British–Irish Ice Sheet expanded across most of the island and surrounding shelf. The principal Irish archive for this earlier interval is Castlepook Cave, also known as Mammoth Cave or Doneraile Cave, near Doneraile in north County Cork. Its bones, sediments and difficult excavation history reveal an environment capable of supporting a remarkable cold-climate fauna. They also offer a tantalising, still incomplete case that people may have visited Ireland far earlier than the island's traditionally accepted late-glacial human record.

Time Before Calendar Years

Modern BCE labels give a misleading impression of precision. Archaeologists date material from this period chiefly through radiocarbon measurement, then convert radiocarbon ages into calibrated ranges using internationally maintained calibration curves. Those ranges may span centuries or millennia; they do not identify an individual season, much less an exact year. Moreover, the relevant evidence is not a single layer sealed in a secure camp site. Castlepook's cave deposits accumulated over a long time and were disturbed by water, animal activity and early excavation.

MIS 3 broadly spans about 57,000 to 29,000 years ago. Its climate was cold but punctuated by rapid shifts, rather than uniformly locked into the maximum conditions that came later. The date considered here lies near the end of that interval, before the Irish sector of the British–Irish Ice Sheet attained its last maximum extent. Research on ice-sheet chronology places major maximum expansion broadly after 30,000 years ago, with offshore evidence indicating far-reaching ice on western and southern approaches by roughly 27,000–25,000 calibrated years before present. That later advance destroyed, buried or reworked many earlier deposits, a major reason why Ireland’s Palaeolithic record is so sparse.

Thus 31,914 BCE was neither an era of familiar Irish coastlines nor a time from which a continuous ancestry of settlement can be assumed. Sea level was substantially lower globally, exposing broad continental shelves. Yet it is unwise to picture a simple, permanent land bridge from Ireland to Britain or continental Europe: ice margins, rivers, wetlands, changing sea basins and periodically submerged lowlands made access variable. Animals demonstrably reached the island; whether people did so, how often, and by which routes remain questions for evidence rather than assumptions.

A Cold, Open Landscape

The living landscape around this date would have differed profoundly from modern Ireland. There were no oak woods, enclosed fields, towns, farms or peatlands in their familiar later forms. The animal evidence points to open, cold environments with grassland, herb-rich steppe-tundra and patches of shrub or sparse woodland in more sheltered places. Conditions varied regionally with topography, proximity to ice and climatic fluctuation. It would be mistaken to reduce the whole island to a featureless snowfield: a habitat supporting grazing reindeer, mammoth and giant deer was ecologically diverse, even if treeless or thinly wooded over wide areas.

North Cork’s limestone plateau contained fissures and chambers that formed the Castlepook cave system. Caves were not necessarily human dwellings. They were traps, dens, shelters and sediment repositories. Water could wash bones into them; carnivores could carry prey inside; animals could die in or near entrances. Such processes are central to interpreting the evidence. A collection of bones proves animal presence, but it does not automatically demonstrate a hunting ground, a settlement, or a single moment of occupation.

Castlepook is exceptionally important because more than 2,000 bones have been recovered there and dated remains extend across a long middle-to-late Ice Age span. The Geological Survey Ireland identifies it as the island’s richest vertebrate site for the period leading up to the Last Glacial Maximum. Its value lies not in providing a neat prehistoric narrative, but in preserving a rare cross-section of a vanished Irish ecosystem.

Mammoths, Hyenas and Reindeer

The fauna attributed to Castlepook includes woolly mammoth, reindeer, giant deer or “Irish elk”, brown bear and spotted hyaena; other remains include wolf, Arctic fox, mountain hare and lemmings. “Irish elk” is a traditional name for *Megaloceros giganteus*, a widespread Eurasian giant deer rather than an animal confined to Ireland. Likewise, mammoth and hyaena connect the island to wider north-west European ecological networks. Their presence is direct evidence that suitable routes and habitats existed at particular times, not proof that every species lived together continuously or in the same exact locality.

Spotted hyaena is especially revealing. Castlepook is the only Irish site known to have produced it, and hyaenas may themselves explain part of the assemblage. A hyaena den accumulates bones through scavenging, hunting and chewing; it can also mix material from successive episodes. Carnivore teeth, weathering, sediment movement and later disturbance therefore have to be distinguished from marks made by people. The cave's old collection is scientifically valuable precisely because modern osteological and radiocarbon methods can revisit individual specimens, but its original contexts cannot simply be recreated.

Earlier radiocarbon programmes placed several Castlepook animals within MIS 3, including a reindeer, brown bear, giant deer and lemmings. A 2020 reassessment using improved bone pretreatment found that some 1990s measurements had been too young by thousands of radiocarbon years. It strengthened the case for an older MIS 3 fauna, while also making simplistic date conversion hazardous. The sound conclusion is broad: southern Ireland supported substantial Pleistocene animal communities well before the Last Glacial Maximum, including around the timescale represented by this article.

The Reindeer Bone Question

The most consequential possible trace of people is a reindeer femur from Castlepook. Re-examination of the historic collection identified deep marks interpreted as consistent with chopping or butchery by a stone tool. Public reporting described the bone as about 33,000 years old and presented it as evidence for human activity in Ireland more than 20,000 years before the previously accepted late-glacial indication from a cut-marked bear bone at Alice and Gwendoline Cave in County Clare.

This is important evidence, but it must be described accurately. The bone does not supply a human skeleton, an excavated hearth, stone tools in undisturbed association, a built shelter, artwork, or a cemetery. Nor does it identify the people's language, ancestry, name, political group or length of stay. Because Castlepook's deposits have been disturbed and the evidence is so rare, the strongest formulation is that modified bone provides a plausible indication of Upper Palaeolithic human activity or butchery in Ireland during the Late Pleistocene. It does not yet establish a settled population at 31,914 BCE.

Recent fieldwork has properly focused on testing this proposition. Archaeologists have surveyed and excavated previously less-disturbed chambers, looking for stratified deposits, charcoal, lithics, further modified bone and environmental evidence. Such work matters more than repeating a dramatic "first settlement" claim. A securely dated stone tool or hearth associated with faunal remains would clarify whether people entered the cave, processed animals nearby, or merely left a fleeting trace in a wider landscape also used by carnivores.

Life, Society and Exchange

If the reindeer marks are human-made, they imply a small, mobile hunting and gathering party rather than an established village. Reindeer offered meat, marrow, fat, hide, sinew, antler and bone; a large animal could sustain several people and provide useful raw materials. That is an inference from Upper Palaeolithic subsistence elsewhere in north-west Europe, not something the Irish bone alone can demonstrate. We cannot responsibly specify camp size, gender roles, technologies, seasonal routine or hunting strategy for Castlepook.

There is likewise no evidence for political affairs, diplomacy, formal warfare, territorial kingdoms, religious institutions, trade networks or named leaders in Ireland at this date. It would be anachronistic to manufacture them. Human groups, if present, would have maintained social relations and knowledge

essential to survival, but their organisation is archaeologically invisible in Ireland. We do not know whether a visit was part of a recurring route, a short hunting expedition, a refuge during environmental change or an isolated crossing.

Culture and learning can be discussed only at the broadest level. Upper Palaeolithic communities elsewhere in Europe possessed sophisticated stone-working traditions, practical ecological knowledge, clothing and social communication, and in some regions created ornaments, images and cave art. None of that can presently be assigned to Ireland around 31,914 BCE. The absence of Irish evidence is not proof that visitors had no culture; it is a limit on what the surviving record allows historians to claim.

An Island of Possibilities

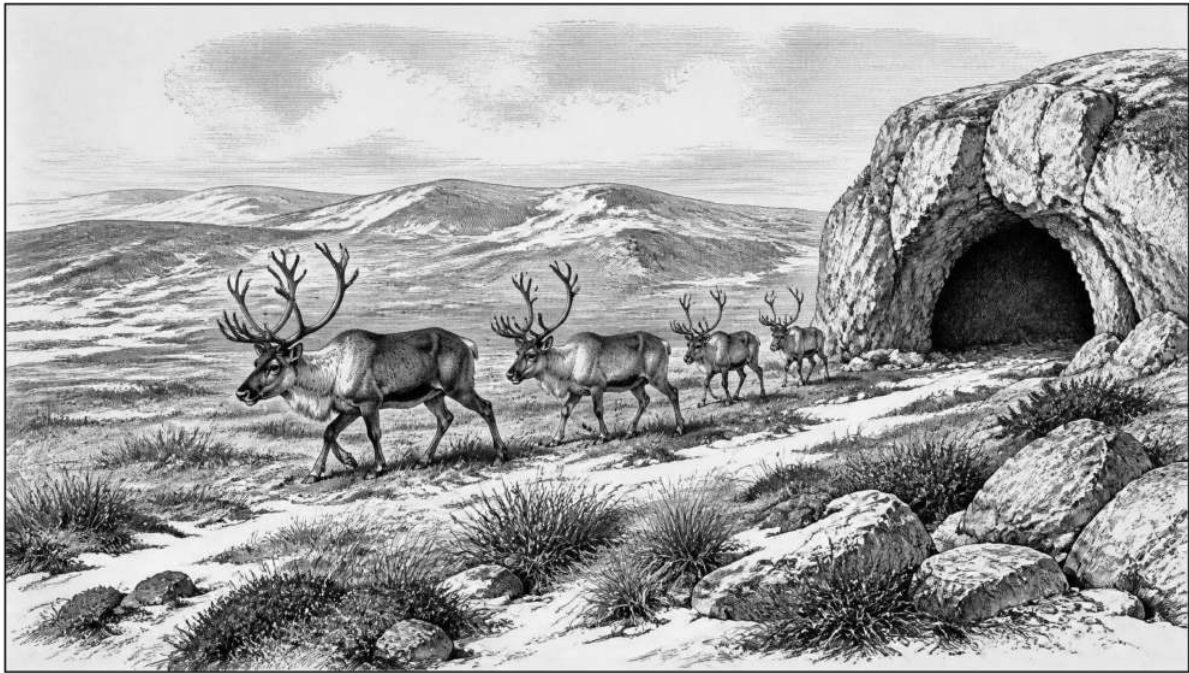
The great historical development represented by this date is not a battle, accession or treaty, but the recognition that Ice Age Ireland was intermittently part of a wider European world of animals, shifting climates and possibly people. Castlepook's Mammoth Cave preserves the strongest window onto that world. It shows that Ireland was not an empty, timeless stage awaiting the Mesolithic settlers of millennia later. Yet the evidence also demands restraint: the full ice advance would transform the island, and any small earlier human presence may have vanished without leaving a continuous settlement tradition.

For 31,914 BCE, then, the most defensible picture is of a cold, open Irish landscape where reindeer and other Pleistocene mammals ranged across habitats connected, at intervals, to neighbouring lands. In a limestone cave near modern Doneraile, bones accumulated through natural and animal processes, perhaps including one episode of human butchery. That modest but extraordinary possibility is enough to change the scale of Ireland's deep past; it is not enough to invent the people's story.

Chapter 088 of 100

31913 BCE

Doneraile's Reindeer Cutmark^[88]



A date labelled 31,913 BCE offers a useful point from which to examine a very remote Irish past, but it must not be mistaken for a year that archaeology can observe. Nobody in Pleistocene Ireland used this calendar, and no excavation can assign an Irish camp, hunt or climatic episode to this particular twelve-month interval. At this depth of time, radiocarbon determinations carry substantial uncertainty and must be calibrated against changing atmospheric carbon levels; cave deposits may also mix remains accumulated at different moments. The responsible historical frame is therefore broader: this point falls within the later part of Marine Isotope Stage 3, a fluctuating cold phase before the Last Glacial Maximum.

What can be said is both limited and remarkable. Ireland was not yet the familiar green, wooded island of later prehistory. Its landscape was being reshaped by a severe Ice Age climate, and its best evidence comes not from houses or monuments but from animal bones, cave sediments, glacial landforms and the laboratories that date and reassess them. Around this broad period, north Cork's Castlepook Cave, near Doneraile, preserves the island's most important archive for the Pleistocene animal world before the great ice advance.

A Date Beyond Annual History

The numerical label 31,913 BCE is a modern conversion, not an exact prehistoric calendar date. For periods this old, scholars normally use calibrated years before present (cal BP, with "present" conventionally fixed at 1950) or broad geological stages. The calibration curve itself becomes less exact further back in time, while the survival of enough original collagen for radiocarbon dating is a separate challenge. Modern re-dating of Irish cave bones has shown why such caution matters: improved pretreatment has made several Castlepook dates thousands of radiocarbon years older than earlier results.

This does not make the evidence useless. It makes the questions more exacting. A directly dated bone can demonstrate that an animal was alive within a calibrated range. It cannot, by itself, date every bone lying nearby, establish a single intact living surface, or prove that people occupied the cave. The 31,913 BCE label should thus be read as an approximate window into a changing Late Pleistocene world, rather than a moment at which a known Irish event occurred.

Before the Ice Sheet's Maximum

At this broad point in the chronology, the British–Irish Ice Sheet was growing but had not yet reached its fullest Last Glacial Maximum extent. Major reconstructions place the build-up of the ice sheet after roughly 35,000–32,000 years ago, with maximum conditions developing later, broadly between about 27,000 and 21,000 years ago. The timing was not uniform across Ireland: glaciers advanced, thickened and shifted differently in different sectors, while some mountain summits and margins experienced conditions distinct from the great ice streams.

That distinction is important for the south. Ireland should not be imagined as a single unchanging block of ice at 31,913 BCE. Its climate was cold, dry and unstable by modern standards, but the exact local extent of ice remains debated and has been reconstructed from landforms, offshore sediments and exposure dating. In the decades and millennia ahead, ice would transform drainage, scour valleys and redistribute vast quantities of sediment. Eskers, drumlins, glacial valleys and many other familiar elements of Ireland's physical landscape belong to the longer legacy of these repeated advances and retreats, though they cannot be tied to this particular year.

Vegetation appropriate to such a climate was sparse and open rather than forested. Grassland, herbs, sedges, dwarf shrubs and patches of tundra-like ground would have supported grazing animals where conditions permitted. It is better to call this a changing cold-stage mosaic than to picture one uniform “mammoth steppe” extending unchanged across the whole island. Pollen and fossil records are fragmentary, and local habitats would have varied with exposure, soil, snow cover, rivers and the approach of ice.

Castlepook's Animal Archive

Castlepook Cave is central because its deposits have yielded an unusually rich range of Late Pleistocene remains. The early twentieth-century cave investigations recovered bones of reindeer, woolly mammoth, giant deer, brown bear, wolves, foxes, Arctic foxes, lemmings and spotted hyaena, among other animals. Such a list demonstrates that Ireland could support a far more cold-adapted and, at times, more formidable fauna than later historical Ireland. Yet it must not be treated as a census taken in one season. The cave accumulated material over a long span, and some specimens belong to separate climatic episodes.

Recent work has materially altered the chronology. Re-dating indicates that some of Castlepook's pre-Last Glacial Maximum animals are older than formerly believed, and research has suggested that giant deer and spotted hyaena may have disappeared locally around 40,000 calibrated years ago, well before the ice sheet's maximum. For the broad era represented by 31,913 BCE, reindeer are especially relevant: they were animals of open, cold country and their remains occur at Castlepook. Mammoth, too, is securely part of the cave's deeper Pleistocene record, although one should not claim that every species represented in the cave lived alongside every other species at this exact time.

The cave was not necessarily a place where people lived. Carnivores could drag carcass parts into underground shelters, scavenging could alter bones, water and sediment could move them, and the original excavators worked before modern methods of three-dimensional recording and fine-grained stratigraphic analysis. Castlepook is therefore a record of ecological processes as well as animal presence. New fieldwork seeks undisturbed deposits and applies techniques unavailable to the original investigators, including renewed dating and detailed study of bone surfaces and cave sediments.

The Reindeer Bone Question

The closest possible connection between this period and people is a reindeer femur fragment from Castlepook. County Cork heritage publications identify it as dating to about 31,000 BCE and describe a mark interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone tool during butchery. If that interpretation is confirmed through fully published specialist analysis and securely resolved chronology, it would be evidence that Upper Palaeolithic people reached Ireland much earlier than the previously accepted late-glacial human trace.

Its significance should not be overstated. The directly relevant bone was recovered from an old cave collection, not from a newly excavated, sealed hunting floor accompanied by tools, hearths and refitting debris. A cut-marked carcass bone, even if demonstrably human-modified, would show an act of butchery or carcass processing; it would not establish a permanent settlement, a population of any known size, or continuous occupation. Nor does it permit the naming of a people, language or cultural tradition on Irish soil. A brief visit by a small mobile group is a possible interpretation, not a demonstrated Irish society.

This cautious conclusion sits beside a firmer, much later result. At Alice and Gwendoline Cave in County Clare, a brown-bear kneecap bearing cut marks was independently dated to calibrated ranges of about 12,810–12,590 and 12,810–12,685 cal BP. That find is peer-reviewed evidence for a Late Upper Palaeolithic human presence after the worst glacial conditions had passed. It confirms that people did eventually reach Ireland in the terminal Pleistocene, but it cannot be projected backwards to prove occupation around 31,913 BCE.

No Kingdoms, No Settlements

There is no responsible basis for describing political affairs, diplomacy, warfare, rulers, tribes, law or territorial boundaries in Ireland at this date. There are no named people, inscriptions, graves, houses, weapons assemblages or monuments from which to reconstruct them. Likewise, there is no evidence for farming, herding, permanent villages, exchange networks, seafaring routes, formal religion, art or learning on the island in this period. These absences are not evidence that human groups elsewhere lacked culture; Upper Palaeolithic communities in other parts of Europe possessed sophisticated social worlds and material traditions. They simply cannot be imported into Ireland as facts.

If the Castlepook reindeer mark proves anthropogenic, it would make subsistence the only subject that can be approached directly: the removal of meat, tendon or hide from a large animal. Reindeer would have supplied valuable food and raw materials, and a travelling hunting party could have made practical use of a carcass. But even this remains an interpretation of one disputed or still-developing line of evidence. No Irish stone-tool assemblage of this age has been securely associated with it.

An Island in Ecological Transition

Regional change, rather than human history, is the chief story. During cold phases, lower sea levels altered the outlines of the surrounding seas and the geography of movement between Ireland, Britain and continental Europe. Whether particular routes were exposed, ice-blocked, marshy or navigable changed through time. The evidence does not justify a simple picture of a permanent land bridge that automatically delivered people and animals to Ireland. Colonisation depended on climate, available habitat, ice margins, sea crossings and chance, and these factors did not act in the same way for every species.

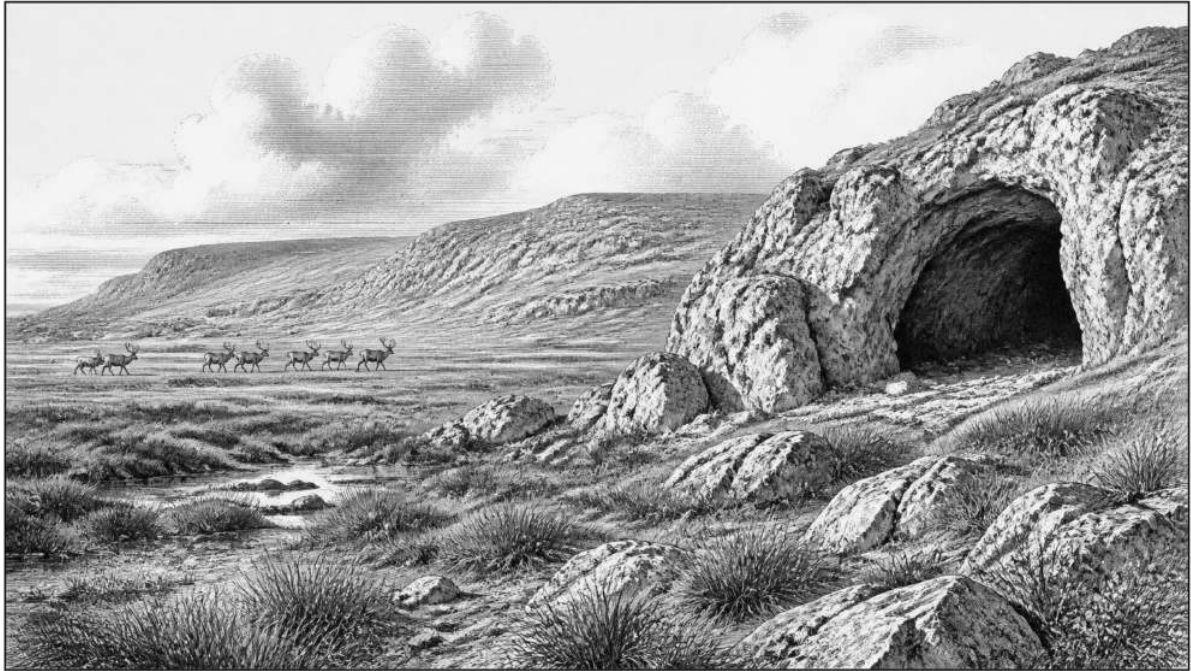
Castlepook's bones show that large mammals and predators did reach Ireland before the Last Glacial Maximum. The subsequent expansion of ice and worsening environmental conditions likely eliminated or displaced many of them. Later recolonisation after deglaciation would produce a different, reduced fauna and eventually enable sustained human settlement. In that sense, 31,913 BCE belongs not to the beginning of continuous Irish history but to a much older ecological prelude: a cold and mobile world, known chiefly through fossil bone, approaching the disruptive power of the great ice sheet.

The most compelling lesson is methodological. Ireland's deep past is continually revised as old museum collections are re-examined, measurements are recalibrated and caves are excavated with modern techniques. The reindeer bone near Doneraile may yet alter the story of the first human visits to the island. For now, it illuminates a possibility within a securely attested Ice Age landscape, not a year of recorded settlement or a lost prehistoric kingdom.

Chapter 089 of 100

31912 BCE

Elephant Hall Bone Sands^[89]



The label 31,912 BCE conveys a precision that the evidence cannot sustain. No community in Ireland recorded a calendar year at this depth of time, and archaeology cannot identify an event, a ruler or a season that can responsibly be assigned to it. In modern chronological terms, the date falls broadly about 33.9 thousand calendar years before 1950, within the Late Pleistocene and the closing part of Marine Isotope Stage 3 (MIS 3). For this era, radiocarbon determinations require calibration against changing atmospheric carbon; results are probability ranges rather than exact anniversaries. The appropriate history is therefore one of landscapes, animal remains, cave deposits and carefully limited possibilities, not a year-by-year narrative in the normal sense.

A Cave Archive, Not a Chronicle

The Irish site most relevant to this point is Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. Its narrow limestone passages include chambers named Elephant Hall, Hyæna Hall and the Gallery of Aged Carnivores. Excavations between 1904 and 1913 recovered more than 2,000 animal bones and teeth from sands beneath and between stalagmite floors. Geological Survey Ireland describes Castlepook as Ireland's richest known archive for vertebrate life in the long interval leading towards the Last Glacial Maximum. Individual specimens from its collections have produced dates spanning approximately 45,700 to 19,950 radiocarbon years BP: an immense stretch of time, not one contemporaneous animal community.

That qualification is central. Early excavators did valuable work by recovering material that might otherwise have vanished, but their methods pre-dated modern excavation, fine-grained spatial recording, micromorphology and many techniques of taphonomic analysis. Water, sediment movement, later animals and human digging could mix deposits. The cave's fossil assemblage is consequently not a frozen

moment of 31,912 BCE, nor is every bone from Elephant Hall necessarily of the same age as every bone from Hyaena Hall. Modern redating has made the difficulty plain: improved pretreatment of bone samples produced Castlepook dates some 5,000 to 12,000 radiocarbon years older than earlier results.

Yet the archive is exceptionally important. It establishes beyond doubt that southern Ireland supported a varied Ice Age fauna during parts of MIS 3. Reindeer, woolly mammoth, giant deer, brown bear and spotted hyaena occur in the Castlepook record, while wolf, Arctic fox, mountain hare, Norwegian lemming and collared lemming are also represented. Such remains do not prove that every species met in one valley on one day. They do, however, overturn any simple image of an utterly lifeless Ireland before the great late-glacial ice expansion.

Cold Country in Transition

At around this broad date, Ireland lay within an unstable North Atlantic Ice Age world. MIS 3 was not uniformly cold: abrupt climatic shifts punctuated a longer trend towards greater glaciation. The last British–Irish Ice Sheet had not yet reached its eventual maximum volume, dated by the BRITICE-CHRONO reconstruction to about 23,000 years ago, but ice was expanding in the region during the subsequent millennia. It would be wrong to portray all of Ireland in 31,912 BCE as buried under the later kilometres-thick ice sheet; equally, it would be wrong to imagine a mild or wooded island.

The closest evidence suggests a cold, open and environmentally varied terrain, with vegetation able to sustain grazers and browsers during favourable phases. Reindeer are especially informative: they are adapted to seasonal, open environments and their presence is consistent with grass-, sedge-, herb-, moss- and lichen-rich habitats rather than closed forest. Mammoth remains indicate that at least parts of the wider landscape could support very large herbivores. Lemmings and Arctic fox point strongly towards severe cold conditions. Predators and scavengers, particularly wolves and spotted hyaenas, indicate a functioning food web in which carcasses could be moved, consumed and dispersed far from their original death places.

Spotted hyaena deserves particular emphasis because Castlepook is the key Irish locality for it. Hyaenas may have used caves as dens and brought bones inside; tooth damage and patterned accumulation can therefore reflect carnivore behaviour rather than human hunting or food storage. This is one reason archaeologists must separate the ecological fact of an animal's presence from claims about people. A mammoth rib in a cave is evidence for mammoth in Ireland, for example, but not evidence that humans killed or ate a mammoth.

The Reindeer Femur Question

The direct human question rests principally on one striking but limited item: a reindeer femur fragment from the Castlepook collection, publicised in 2021 as radiocarbon dated to about 33,000 years ago and bearing deep marks interpreted as consistent with cutting or chopping by a stone tool. If that diagnosis is confirmed, it would be evidence that people handled, and perhaps butchered, a reindeer in Ireland in the broad era addressed here. It would push possible human activity on the island far beyond the later Upper Palaeolithic indication from a butchered brown-bear patella at Alice and Gwendoline Cave, County Clare, dated to 12,810–12,590 calibrated BP.

It must not, however, be inflated into a settlement story. A date on the femur dates the death of the reindeer within scientific uncertainty; it does not date the cutting action to an exact calendar year, identify the cutter, or establish where the animal was killed. Nor has Ireland yielded a securely associated hearth,

dwelling floor, diagnostic stone-tool assemblage, human skeleton, burial or artwork of roughly 34,000 calendar years ago. The old collection lacks the tightly controlled excavation context that would allow a single modified bone to answer all these questions. The responsible conclusion is that a brief human incursion is possible, even important, but continuous occupation or a permanent population remains unproven.

Renewed fieldwork shows why the issue remains open rather than settled. A 2022 research excavation at Castlepook sought surviving Pleistocene sediments in both the older excavated galleries and the lower cave system. It established that deposits still survive in selected areas, although some investigated layers included modern material and redeposited sediment. New excavation, direct dating, ancient-DNA work and microscopic study of modified surfaces offer the best prospect of testing whether the femur represents a human visit, a genuine butchery episode or a different process altogether.

No Kingdoms, No Proven Communities

There is no evidential basis for political affairs in Ireland at this date. No named peoples, chiefs, territories, alliances, diplomatic contacts, laws or wars can be identified. Nor should possible visitors be called Irish in an ethnic, linguistic or national sense: those categories belong to vastly later historical worlds. Archaeological silence is not proof that people lacked social lives, but it does mean that Ireland provides no direct record of their leadership, kinship structures, language or beliefs.

The same restraint applies to religion, culture and learning. Upper Palaeolithic groups elsewhere in Europe made ornaments, images, musical instruments and complex stone technologies; recent research also demonstrates that *Homo sapiens* had reached north-western and central Europe well before this period. That wider evidence makes a human arrival in Ireland conceivable. It cannot prove that Castlepook visitors made cave art, held rituals, wore ornaments or belonged to a particular archaeological tradition such as the Aurignacian or Gravettian. Ireland has no diagnostic assemblage that permits such a label around 31,912 BCE.

Livelihoods as Possibility

If people reached the island, their immediate economy would have been hunter-gathering, not farming. A reindeer carcass could have offered meat, fat, marrow, hide, sinew and bone, while the existence of cut marks in the appropriate anatomical setting would suggest practical knowledge of carcass processing. Small mobile groups operating in cold country would have required co-operation, portable equipment, warm clothing and temporary shelter. These are reasonable inferences from human survival in comparable Upper Palaeolithic environments, rather than objects recovered from an Irish camp.

Trade cannot be demonstrated. There are no Irish stone sources, imported artefacts or exchange networks securely documented for this interval. Likewise, no evidence supports crop-growing, herding, permanent houses, cleared fields, boats or a regular route to Britain or continental Europe. Lower global sea level changed coasts and exposed more continental shelf than today, but changing ice margins, relative sea level and channels make a simple dry land bridge an unsafe assumption. Any hypothetical visitors may have travelled across a shifting maritime and ice-influenced region; the evidence does not yet specify how.

Approaching the Glacial Maximum

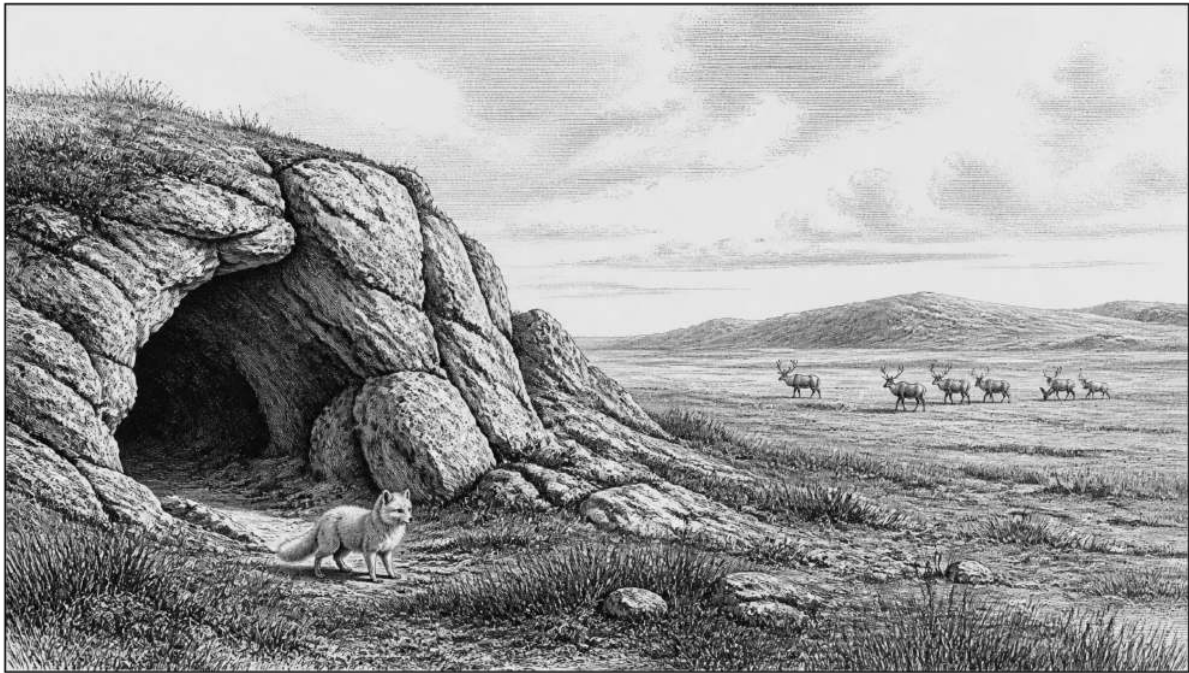
Regional change is the great historical development. The biological world represented in Castlepook was vulnerable to climatic deterioration and advancing ice. Redating suggests that giant deer and spotted hyaena may already have become locally extinct in Ireland by around 40,000 calibrated years BP, before the Last Glacial Maximum. Later, the expanding British–Irish Ice Sheet profoundly remodelled landscapes and removed or buried much evidence of earlier life. This destructive geological history helps explain why a possible human presence may survive only as a disputed mark on a curated bone rather than as a recognisable camp.

Thus the most historically defensible picture is modest but significant. Around the time represented by 31,912 BCE, parts of Ireland were occupied by cold-adapted mammals in an open, fluctuating Ice Age landscape. Castlepook Cave preserves their traces, especially in the bone sands of Elephant Hall and neighbouring passages. One reindeer femur raises the possibility that people briefly entered this world and processed an animal there or nearby. It does not yet disclose a community, a culture or an event in a calendrical year. The distinction between those claims is not a limitation on Ireland's deep past; it is the discipline that allows the evidence to remain meaningful.

Chapter 090 of 100

31911 BCE

Castlepook's Mammoth Assemblage^[90]



No event can responsibly be assigned to 31,911 BCE in Ireland. This is a modern calendar label projected far beyond any written record, rather than a date that prehistoric people could have recognised. It corresponds only approximately to 33,860 years before 1950, conventionally expressed as about 33.9 thousand calibrated years BP. At this depth of time, radiocarbon results carry ranges, cave deposits may mix material from different episodes, and the archaeological evidence does not resolve a single season, year, community or journey.

What can be said is that Ireland lay within the later part of Marine Isotope Stage 3, an unstable cold phase before the Last Glacial Maximum. The island's best evidence is not a settlement, grave, tool-kit or monument, but a difficult archive of animal bone, cave sediment, ice-sheet reconstruction and changing sea level. Around this point in time, the central historical development was environmental: the approach of the glacial conditions that would remake Ireland's land surface and greatly narrow the chances of preserving any traces of people.

Time Measured in Ranges

Prehistoric chronology needs careful translation. "BP" means before AD 1950, the reference year used by radiocarbon science; a calibrated age converts a radiocarbon measurement into a probability range in calendar years. Neither system licences the apparent precision of a named BCE year. The figure 31,911 BCE is therefore useful as a position on a long timeline, but it should not be mistaken for a securely dated Irish episode.

The available evidence is especially uneven. Most Pleistocene bones in Ireland were recovered during nineteenth- and early twentieth-century cave excavations, often before modern recording standards. Some were subsequently dated directly by radiocarbon methods; others are assigned an age from their

association with deposits or fauna. Water, collapse, animal activity and older excavation can move material within a cave. A bone found beside another bone is not automatically contemporary with it. The most responsible account of Ireland around 33,900 years ago must therefore describe broad environmental and faunal horizons, not reconstruct a precise day in the life of an imagined Ice Age band.

A Landscape Nearing Glaciation

Ice-sheet research shows that the British–Irish Ice Sheet grew rapidly after this broader period and reached its greatest extent later, roughly 27,000–23,000 calibrated years BP. At maximum extent, ice covered all of Ireland and extended across much of the surrounding continental shelf. The exact onset, pace and local pattern of build-up remain less securely dated than the retreat, so it would be wrong to draw a firm ice margin across Ireland for 31,911 BCE. Models and geological evidence nevertheless point to a colder world in which ice caps had begun to develop in upland parts of the region and conditions could alter sharply.

Ireland was not then a familiar green island of woods, enclosed fields and Atlantic pasture. Lower global sea level exposed far more of the continental shelf than survives above water today, while glaciers, rivers and frost transformed the terrain. Yet low sea level does not automatically prove an easy overland route from Britain, or a continuous land bridge open to travellers at this particular moment. The configuration of ice, water, exposed shelf and hazardous ground changed through time. Animal movements and any human crossings must be treated as possibilities constrained by geography, not as evidence for a highway into Ireland.

The vegetation implied by cold-stage fauna was open rather than forested: a mosaic of grasses, sedges, herbs, dwarf shrubs and patches of sparse woodland or scrub where conditions permitted. Such terrain could support grazing animals, but it was not uniformly barren. Wind exposure, seasonality and local shelter mattered greatly. Limestone caves and fissures in the south and west preserve a fragmentary record precisely because they could trap bones and sediment, not because they were necessarily chosen as permanent shelters by people.

The Castlepook Archive

The crucial Irish locality for this interval is Castlepook Cave, also called Mammoth or Doneraile Cave, near Doneraile in north County Cork. It is a limestone cave system whose deposits have yielded Ireland's richest known assemblage of Pleistocene vertebrate remains from the period leading towards the Last Glacial Maximum. The list is striking: woolly mammoth, giant deer or "Irish elk", reindeer, brown bear, wolf, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena. The cave is a major reminder that Ireland's ancient fauna was once far more varied than its later native mammal community.

That list should not be converted into a single crowded scene. Castlepook accumulated remains over a long span, and direct dates have revised earlier assumptions. Reassessment of the Marine Isotope Stage 3 material indicates that some species traditionally grouped together may belong to different phases. In particular, work on the dated fauna suggests that giant deer and spotted hyaena may have disappeared locally before about 40,000 calibrated years BP. Thus their presence in the cave proves that they belonged to Ireland's earlier cold-stage world; it does not demonstrate that a giant deer, mammoth and hyaena stood together outside the entrance in 31,911 BCE.

Even so, the assemblage illuminates ecological relationships. Reindeer and lemmings are consistent with cold, open habitats. Mammoth remains point towards the existence, at least in some earlier or overlapping intervals, of large herbivores able to exploit extensive grass- and herb-rich environments. Hyena bones, teeth and gnawing evidence are important because hyenas could carry carcass parts into caves and modify bones. Wolves, foxes, bears, scavengers, natural deaths and moving water may all have contributed to the deposits. Castlepook is consequently an ecological archive, not a butcher's floor or a village refuse pit.

Did People Reach Ireland?

The question of human presence is the most compelling and the least settled. A reindeer femur from Castlepook has been reported as bearing marks interpreted as human chopping or butchery, and a radiocarbon result on the specimen has been publicised as placing it roughly 33,000 years ago in radiocarbon terms. If future specialist analysis establishes both the marks' anthropogenic origin and their secure relationship to the animal's age, it would be exceptionally early evidence for people in Ireland.

That conclusion cannot yet be treated as proof of a resident Upper Palaeolithic population, nor can it be pinned to this calendar year. The cave has complicated deposits; the relevant claims require full contextual publication, reproducible taphonomic analysis and comparison with damage caused by carnivores, trampling, sediment movement and excavation. Most importantly, Ireland has not produced a securely dated lithic assemblage, hearth, structured occupation surface, human burial or dwelling of this age. A marked bone, even if humanly modified, would show contact with a carcass. It would not by itself reveal the size, language, ancestry, duration of stay or social organisation of those responsible.

The contrast with the better-established later record is instructive. A cut-marked brown-bear patella from Alice and Gwendoline Cave, County Clare, provides evidence for human activity only in the terminal Pleistocene, around 12,800–12,600 calibrated years BP. The first enduring archaeological settlement evidence is much later again, in the Mesolithic. Those later finds should not be projected backwards. Around 31,911 BCE, the fairest judgement is that human presence remains unproven, although Castlepook makes the possibility of brief incursions a legitimate subject for research.

No Kingdoms, No Trade Routes

There is no evidence from this horizon for political affairs, diplomacy, organised warfare, chiefs, territories or named peoples in Ireland. Nor is there evidence for farming, herding, exchange networks, craft production, monuments, formal burial practices, religion or learning. Silence on these themes is not a claim that Palaeolithic people elsewhere lacked culture. Upper Palaeolithic communities on the European mainland made sophisticated stone and organic tools, travelled, exchanged materials and created visual culture. It is simply an acknowledgement that no comparable, securely contextualised Irish evidence can be assigned here.

For the same reason, everyday life must be framed conditionally. If people did enter Ireland during this wider period, their most plausible footprint would be small and mobile: a short hunting or scavenging visit, perhaps following seasonal opportunities rather than founding a lasting settlement. They would have needed expert knowledge of weather, animal behaviour, stone, fuel and safe movement through a severe landscape. But this is an inference from the requirements of cold-environment foraging and from mainland comparison, not a discovered Irish camp.

What Survived the Ice

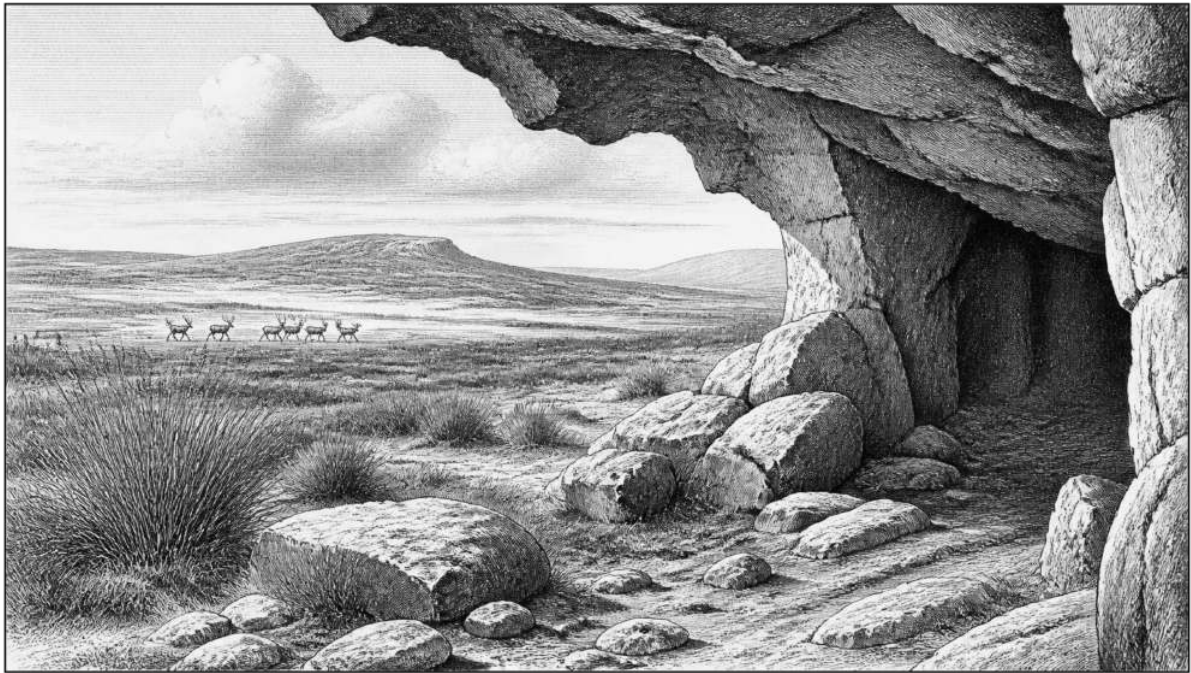
The approaching expansion of ice is part of the explanation for the scarcity of evidence. Glaciers erode bedrock, remove soils, redeposit sediments and disturb older surfaces. Rising and falling seas have also hidden or destroyed former coastal landscapes on the shelf. The Irish record is therefore shaped both by what happened and by what survived. A cave bone may preserve a clue while entire open-air landscapes, where any people might have camped, are gone or lie submerged.

Ireland around 31,911 BCE is best understood not as the opening chapter of a continuous national story, but as a threshold before profound environmental disruption. Castlepook preserves the bones of an unexpectedly rich cold-stage fauna and poses an unresolved question about human contact. The ice-sheet record shows a landscape moving towards transformation. Beyond those facts lie possibilities, not certainties. The responsible history of this year is accordingly one of calibrated ranges, fractured evidence and a cave archive that still has much to reveal.

Chapter 091 of 100

31910 BCE

Castlepook's MIS 3 Fauna^[91]



The label 31,910 BCE has a deceptive exactness. No people in Ireland then used a calendar, and archaeology cannot isolate an event, ruler or journey to that single modern year. In conventional conversion it lies about 33,859 years before AD 1950, within Marine Isotope Stage 3 (MIS 3), broadly c. 57,000–29,000 calibrated years before present. The responsible subject is therefore not a fictional ‘year in Ireland’, but an interval around it: a late-Pleistocene world known from cave deposits, fossil bones, glacial landforms and changing sea levels. These forms of evidence are precious, but they are not a diary. They describe environments and animal movements over long spans, often with substantial uncertainty.

A Landscape in Transition

Ireland stood within the last Ice Age, but it should not be imagined as a simple, permanently frozen island under one unchanging sheet of ice. MIS 3 was climatically unstable, and the growth, extent and behaviour of the British–Irish Ice Sheet varied regionally and through time. Research on southern Ireland indicates that the main expansion of the last Irish ice sheet began from initially ice-free conditions at about 34,000 years ago and reached the south coast only after about 24,000 years ago. Around this notional date, then, parts of Ireland may have remained available to cold-adapted animals even as glacial conditions intensified elsewhere. That is an interpretation from regional geological evidence, not a precise map of conditions on any one day or in every valley.

Sea level was lower globally than it is now, because more water was held in ice sheets. Yet lower sea level does not automatically mean that a dry and dependable route joined Ireland to Britain or continental Europe. Relative sea level around Ireland was altered by the weight of ice depressing the land, while ice, water and exposed shelf changed together. Reconstructions of Irish insularity are particularly cautious

even for much later periods. For c. 33.9 thousand calibrated years ago, it is safer to say that the geography of coasts and crossings differed greatly from the modern map than to claim a specific land bridge or migration corridor.

The Cave Near Doneraile

The chief Irish evidence relevant to this period comes from Castlepook Cave, also called Mammoth Cave or Doneraile Cave, in the limestone country north of Doneraile, County Cork. It is not a settlement excavated in modern conditions. Much of its famous bone collection was recovered during antiquarian investigations in the early twentieth century, when recording methods were far less exact than today. Subsequent work has shown that water disturbance, carnivore activity and earlier digging complicated the deposits. Cave bones can be washed, dragged, re-deposited or accumulated by scavengers; they need not represent animals killed, eaten or even encountered by people at the cave.

Nevertheless, Castlepook is exceptionally important. It is Ireland's richest known archive of vertebrate life leading up to the Last Glacial Maximum. Its Pleistocene fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena; later parts of the record also include such cold-climate animals as Arctic fox, wolf and lemmings. These finds establish that Ireland was, at different moments in the late Pleistocene, reached by a much broader mammal community than survives today. They do not establish that every listed species shared the same hillside, season or century. The cave is a time-averaged archive, not a photograph of 31,910 BCE.

Radiocarbon work has made that distinction more important, not less. The Irish Quaternary Fauna Project originally demonstrated a substantial pre-Last Glacial Maximum mammal record, while later re-dating of material from Castlepook, Foley and Shandon caves found that some earlier results were thousands of radiocarbon years too young. The revised study suggests that giant deer and spotted hyaena may have disappeared locally before about 40,000 calibrated years ago. Thus a mammoth, hyaena or giant-deer bone in the Castlepook collection is compelling evidence for Ice Age Ireland, but cannot simply be assigned to the modern calendar label 31,910 BCE. Dates must be calibrated, their statistical ranges respected, and the archaeological context considered separately.

Animals, Not an Irish 'Nation'

The fauna nevertheless permits a careful environmental reconstruction. Reindeer, mammoth, lemmings and Arctic fox point to episodes of markedly cold conditions and largely open habitats rather than the dense temperate woodland familiar from much later Ireland. Large herbivores would have needed extensive grazing or browsing grounds, while predators and scavengers followed the opportunities such animals created. Spotted hyaena is especially significant. Castlepook is Ireland's only known site for the species, and hyaenas commonly transport carcass parts and bones into dens. Their presence is a warning against treating every fractured or marked bone as evidence of hunting by humans.

For everyday life, economy and settlement, however, the evidence is almost wholly silent. There are no securely dated houses, hearths, stone-tool floors, burials, storage pits, boats or camps from Ireland around this time. There is no basis for naming a community, estimating a population, or describing a regular seasonal round. If people briefly reached Ireland during favourable phases of MIS 3, they would probably have been highly mobile hunter-gatherers, as were Upper Palaeolithic groups elsewhere in north-west Europe. But that is a comparative possibility, not a demonstrated Irish social system. It cannot be used to populate the island with permanent bands, tribal territories or a continuous ancestry.

A Possible Human Trace

The reason this period has become especially interesting is a reported reindeer femur fragment from the Castlepook collection. It has been described as bearing marks consistent with butchery by a sharp stone implement and as dating to roughly 33,000 years ago. If the age of the bone and the interpretation of the marks are both upheld, it may indicate that a person processed reindeer in Ireland during the Upper Palaeolithic—an immensely earlier human trace than was once expected. In practical terms, such an action might have involved removing meat, hide or sinew from a carcass. Yet one modified bone would record an episode, not necessarily a hunt at the cave, much less a permanent occupation.

This claim requires restraint. The relevant specimen derives from an old collection rather than a newly excavated, sealed living surface, and no associated contemporary tool assemblage, hearth, dwelling or human remains has been published. County Cork's archaeological survey accordingly stresses the historic absence of clear human traces from the main Castlepook assemblage, while the National Museum of Ireland continues to state that clear evidence for humankind in Ireland during the Palaeolithic has not yet emerged. Those positions are not a reason to ignore the reindeer bone; they explain why it should be treated as a potentially transformative but unconfirmed indication rather than settled fact.

There is firmer evidence for a much later Upper Palaeolithic human presence at Alice and Gwendoline Cave in County Clare. A butchered brown-bear patella there has two independent radiocarbon determinations in the range c. 12,810–12,590 calibrated years before present. This does not prove an occupation 20,000 years earlier at Castlepook. Instead, it shows the value of direct dating, microscopic study and transparent contextual analysis in a landscape where caves preserve tantalising fragments but rarely complete stories.

No Politics, No Diplomacy

There can be no responsible account of Irish political affairs, war, diplomacy, religion, formal learning or trade in 31,910 BCE. No written language, named institution, political boundary, shrine or exchange network is known from Ireland at this date. Nor can cave animals be made to stand for a people's beliefs. Upper Palaeolithic art, ornaments and burial practices are known elsewhere in Europe, but importing them into Cork would confuse analogy with evidence. The archaeological record permits no statement about language, kinship, leadership, ritual or collective identity on the island.

Conflict is equally unknowable. Predation, scavenging and competition for shelter were ecological realities, but they are not evidence of human warfare. The principal drama securely visible in Ireland is environmental: species moved through, occupied or disappeared from a shifting north Atlantic landscape; ice accumulated; sea and land relations changed; caves preserved a partial bone record. The human story, if there was one, remains at the threshold of detection.

What This Date Means

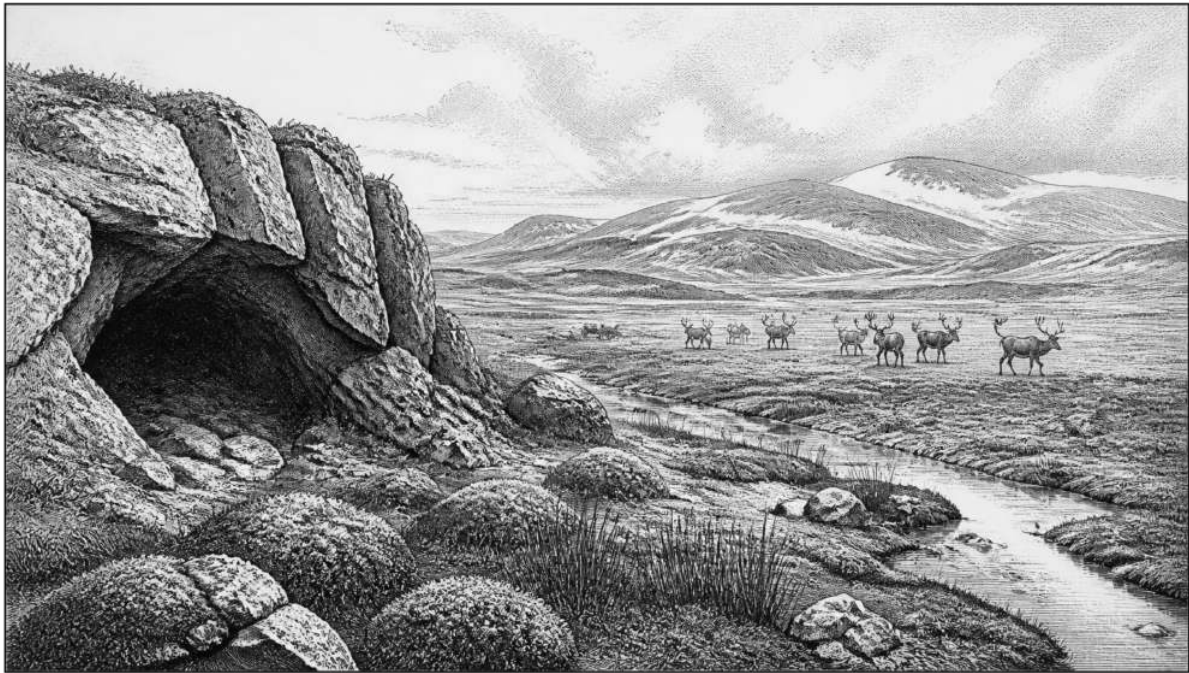
The importance of 31,910 BCE lies not in an anniversary but in a question. Castlepook shows that late-Pleistocene Ireland supported, or was visited by, animals including mammoth, reindeer, giant deer, bear and hyaena across a long and changing interval. It also holds a reported clue that humans may have entered that world far earlier than the formerly accepted post-glacial chronology. New excavations at the cave have the potential to test that proposition further. Until securely associated artefacts or undisturbed

occupation evidence appears, the best conclusion is modest: around this point in MIS 3, Ireland was an unstable Ice Age landscape with a rich but chronologically complex fauna, and perhaps the faintest possible trace of human activity.

Chapter 092 of 100

31909 BCE

Greenagho's Mosses^[92]



31,909 BCE is a modern chronological label, not a year that anyone then living in Ireland could have named or recorded. It corresponds roughly to 33,858 years before the conventional radiocarbon-dating present of 1950, but archaeology cannot isolate events in Ireland to that individual calendar year. The responsible view is therefore a broader one: this was within the later part of Marine Isotope Stage 3, before the Last Glacial Maximum, when climates and ice margins were changing markedly. The available evidence consists chiefly of cave-bone collections, sedimentary deposits, pollen and other environmental traces, many with wide dating ranges and complicated histories of deposition. It reveals an Ice Age landscape, but not an annual chronicle.

A Cold Country Before Maximum Glaciation

At this point in the last glacial cycle, Ireland was moving towards the much more extensive ice cover that developed later. The most recent British–Irish Ice Sheet reconstructions model substantial growth after about 31,000 years ago and an Ireland almost wholly ice-covered by around 28,000 years ago. That does not allow a simple picture for c. 33,900 calibrated years before present. Conditions varied between regions, seasons and short climatic phases, while the exact timing of ice advance remains an active research question. The island was not yet the uniformly ice-dominated terrain of the later glacial maximum, but neither was it a hospitable temperate landscape.

Evidence from County Fermanagh is especially valuable because it records cold, non-glacial intervals rather than merely the action of ice. At Greenagho near Belcoo, organic deposits beneath later glacial sediments have produced a minimum radiocarbon age of 32,460 BP. Other work has discussed an associated calibrated range of approximately 37,200–35,700 cal BP, though the dating and correlations require caution. Mosses, sedges and poorly preserved herb pollen point towards open country with a

northern, cold-climate character. Such deposits do not recreate a particular day or season in 31,909 BCE. They do, however, support an image of sparse, treeless or near-treeless vegetation, freshwater hollows and exposed ground in parts of Ireland before later ice overran or transformed many landscapes.

Castlepook's Time-Mixed Bone Record

The leading Irish source for the wider period is Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. Its limestone galleries were investigated intermittently from the nineteenth century and were extensively excavated in the early twentieth. More than 2,000 vertebrate bones have been recovered, making it the richest known Irish site for fauna leading towards the Last Glacial Maximum. The collection includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, with wolf, Arctic fox, mountain hare, collared lemming and Norwegian lemming also represented in the broader assemblage.

This list should not be read as though every species shared the same hillside in 31,909 BCE. Castle deposits accumulated over long spans; some bone was brought in by carnivores, some moved through water or falling sediment, and early excavations did not preserve the stratigraphic information expected today. Direct radiocarbon dates on individual Castlepook bones range widely. Geological Survey Ireland summarises the dated material as extending from about 45,700 to 19,950 years BP. The Irish Quaternary Fauna Project demonstrated both the power and the problem of the collection: bones assigned to one cave layer could be of markedly different ages. Castlepook is therefore evidence for repeated animal use of a regional landscape, not a single frozen moment.

Even with that qualification, the fauna is significant. Reindeer, lemmings, Arctic fox and mountain hare are consistent with cold, open habitats. Mammoth and giant deer indicate that at least some phases supported large grazing or browsing mammals. Brown bears, wolves and spotted hyaenas show that predators and omnivores formed part of this ecosystem. Hyaenas are particularly informative because dens can accumulate bones from animals carried in as food, making cave assemblages a record both of prey and predator behaviour. Yet the relative abundance of bones cannot straightforwardly measure animal abundance beyond the cave. Carcass transport, scavenging, bone survival and collectors' choices all shaped what reached museum drawers.

Land, Water and Movement

Lower global sea levels altered the outlines of the continental shelf, but they did not automatically create a dependable dry route from Ireland to Britain or continental Europe. The geography of the Irish Sea basin, glacial loading of the land and the position of ice margins all mattered. For animals, and perhaps for people, routes could have opened or closed over time through exposed shelf terrain, coastal corridors, ice, water crossings or combinations of these. The fossil record proves that a diverse mammalian fauna reached Ireland during pre-maximum phases of the Late Pleistocene; it does not identify a single route, a single migration or a permanent land bridge at this date.

The economic life visible in the evidence is consequently ecological rather than social. Large herbivores converted tough vegetation into meat, hide, bone and antler; carnivores hunted, scavenged and competed for carcasses; caves offered shelter or dens and trapped sediments and remains. There is no evidence from Ireland around this notional year for farming, livestock keeping, metalworking, pottery, permanent houses, fields, stores, boats or an exchange network. "Trade" would therefore be an unjustified

term. Equally, the absence of known settlements does not prove that every open area was untouched: glacial erosion, later sediment movement, rising seas and the small scale of archaeological investigation have all reduced the chance of survival and discovery.

The Human Question

The possibility of human presence must be stated carefully. A reindeer femur from Castlepook has been publicised as bearing marks consistent with butchery by a sharp stone tool and as dating to roughly 33,000 years ago. If the marks are confirmed as human-made and securely associated with the dated animal, they would indicate an extraordinarily early Upper Palaeolithic human visit to Ireland. Such an episode might have involved the processing of a reindeer carcass for meat, marrow, hide or sinew. It would be important evidence for activity on the far western edge of Europe before the ice sheet reached its later maximum.

It would not, however, establish a resident population in 31,909 BCE. The femur comes from a historic collection rather than a modern, securely excavated occupation surface. No associated hearth, stone-tool assemblage, dwelling, burial, human skeleton, artistic work or repeated camp sequence has been published from Castlepook for this phase. Fresh research at the cave has rightly sought surviving deposits, but it has also underlined how earlier excavation and water movement complicate interpretation. The National Museum of Ireland continues to say that no clear evidence has yet emerged for human presence in Ireland during the Palaeolithic. The prudent conclusion is that Castlepook raises a serious and potentially transformative question; it does not settle the history of settlement.

No Politics, No Recorded Beliefs

There is no basis for describing political affairs, diplomacy, warfare, named peoples, chiefs, clans or territories in Ireland at this date. Those are institutions and identities that require evidence of organised, enduring human communities, and none has been recovered for this period. Nor can archaeology identify an Irish language, a body of learning, ritual practice, formal religion or artistic tradition around 31,909 BCE. The cave's evocative gallery names, such as Hyena Hall and Elephant Hall, belong to modern investigators, not to Ice Age inhabitants.

If people did briefly reach Ireland during this broader interval, comparison with Upper Palaeolithic groups elsewhere in north-west Europe makes small, mobile hunting parties a reasonable hypothesis, not an Irish fact. Such people would have needed detailed environmental knowledge and practical skills in clothing, fire, food processing and movement through dangerous cold-country terrain. But Ireland has not yielded the material evidence needed to assign a technology, culture or social system to them. The distinction matters: a cut-mark interpretation can suggest an encounter between people and an animal; it cannot support a story about a village, a chiefdom or a nation.

A Landscape More Certain Than Its People

For 31,909 BCE, Ireland's best-attested history is thus environmental. Open, cold habitats supported a succession of Ice Age mammals; caves in the limestone south preserved fragments of their presence; freshwater deposits in Fermanagh retained traces of austere vegetation; and a growing ice sheet was beginning to reshape the island on a far larger scale. Castlepook and Greenagho do not provide an event

for a calendar year. They provide something more appropriate to the evidence: a cautiously reconstructed world in which climate, animals, caves and advancing ice are real, while the presence, movements and meanings of people remain unresolved.

Chapter 093 of 100

31908 BCE

Derryvree's Tundra Pools^[93]



The label 31,908 BCE is a modern chronological convenience, not a date at which an event can be isolated in Ireland's prehistoric record. No written source, settlement sequence or annually resolved archaeological layer permits calendar-year precision so far back. The responsible setting is the later part of the Middle Midlandian, within Marine Isotope Stage 3 of the last Ice Age. The most useful Irish evidence comes from deposits that can be dated only as ranges. In particular, freshwater silts preserved beneath later glacial sediments at Derryvree, near Maguiresbridge in County Fermanagh, produced a radiocarbon result calibrated to roughly 36,900–31,700 years before present: approximately 34,950–29,750 BCE. The nominal year falls within that broad interval, not at a demonstrable moment within it.

A Landscape Between Ice Advances

Derryvree offers an unusually valuable glimpse because its fine sands and organic silts were sealed between two tills, deposits left by separate incursions of glacier ice. During the period represented by the intervening freshwater sediments, south Fermanagh was not buried beneath an ice sheet. It had shallow water, wet ground and plant-rich hollows in a cold, open landscape. Pollen, moss remains and insects indicate tundra or muskeg rather than woodland: grasses, sedges, herbs and juniper were present, while dry ground was probably patchy and sparsely vegetated. Pools and saturated mossy ground could persist beside exposed mineral soils, shaped by freezing, thawing and seasonal meltwater.

This was not the peak of the Last Glacial Maximum, which came later. Yet it was no mild precursor to modern Ireland. Winters were severe, summers short, and the vegetation was treeless. Permafrost or seasonally frozen ground would have constrained drainage and rooting depth. Wind, frost action and solifluction – the slow movement of waterlogged soil over frozen subsoil – continually remodelled

exposed slopes. The familiar wooded and densely settled Irish countryside belongs to a vastly later world. Around this horizon, the island's natural history was principally one of climatic fluctuation, mobile animal populations and advancing or retreating ice margins.

The wider chronology remains difficult. Recent reconstructions of the British–Irish Ice Sheet begin at about 31,000 years before present because earlier margin evidence is sparse and uncertain. They depict initial ice nourishment on high ground, including an accumulation centre in Northern Ireland, while allowing considerable uncertainty in its extent. Other modelling has proposed short-lived ice caps in mountainous parts of Ireland during particularly cold stages. These are reconstructions from landforms, sediments, dates and physical models, not a surveyed map of conditions in any single year. The sound conclusion for 31,908 BCE is therefore regional variation: parts of Ireland remained ice-free or only locally glaciated, while the processes that would later create a much larger ice sheet were gathering force.

Derryvree's Living Evidence

The Derryvree deposit is important precisely because it records an environment rather than an imagined scene. Its botanical and insect evidence supports a cold, largely treeless wetland mosaic, with open pools and surrounding moss vegetation. It demonstrates that north-central Ireland could sustain terrestrial and freshwater ecosystems during a late Pleistocene interval subsequently overwritten by glaciation. It does not identify every plant growing in every county, nor does it yield a complete annual climate record. Organic deposits are local archives: a Fermanagh hollow cannot simply stand for Cork limestone, the western seaboard or upland Kerry. Nevertheless, the sequence strongly cautions against the old simplification that Ireland was continuously and uniformly ice-covered throughout the last glacial cycle.

Animal bones from Irish caves add another, differently imperfect, archive. Castlepook Cave near Doneraile in north County Cork has produced Ireland's most celebrated assemblage of earlier late-Pleistocene mammals. Material attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena points to a fauna capable of living in open, cold-country environments. A mammoth bone has yielded a radiocarbon date of about $33,400 \pm 1,200$ radiocarbon years before present, while other specimens and later re-dating programmes show that the assemblage spans more than one episode. Such dates establish that animals reached Ireland during the broader pre-maximum glacial world; they do not establish that all species met at one watering place, or in the exact year named here.

Castlepook also illustrates the limits imposed by excavation history. Much of its bone material was recovered during early twentieth-century digging, before modern methods of recording stratigraphy, micromorphology and spatial context. Cave water, animal activity and older excavation can mix deposits. Some bones may have been dragged in by carnivores; others may have been moved by sediment or water. Modern excavation resumed in 2022 to locate surviving deposits in the Entrance Gallery, Elephant Hall and connecting passages. That work is significant because intact contexts, if found and dated, can test interpretations built on museum collections. Until then, the cave is compelling evidence for a rich Ice Age fauna, but a difficult source for reconstructing exact ecological communities or events.

Humans: A Possibility, Not a Population

The question most likely to be asked of this period is whether people were in Ireland. The answer must be carefully qualified. A reindeer femur from Castlepook has been publicised as carrying a mark consistent with a sharp stone tool used during butchery and as belonging to this broad early late-Pleistocene horizon. If the mark is confirmed as human-made and contemporary with the death of the animal, it would be evidence for one act of carcass processing by people who reached Ireland far earlier than the traditionally recognised late-glacial evidence. It would be an important discovery.

But a cut or chop mark is not a camp. No securely dated stone-tool assemblage, hearth, dwelling floor, human burial, art panel or occupation surface is known in Ireland from around 31,908 BCE. Nor does a single modified bone demonstrate an enduring resident population, a named archaeological culture, a language or a route used repeatedly. The animal itself may have lived in Ireland without being hunted there; equally, the cave's disturbed history complicates association. The later, better-supported evidence of a butchered brown-bear patella at Alice and Gwendoline Cave in County Clare dates to about 12,800–12,600 calibrated BCE, more than nineteen millennia after the nominal year. It cannot be used to fill the earlier gap.

It is reasonable to say that Upper Palaeolithic hunter-gatherers elsewhere in north-west Europe had the skills to exploit large game and to make sharp stone flakes. It is not responsible to turn that general comparison into a detailed Irish household. There is no evidence here for a permanent village, family structure, clothing, ritual, art, leadership or seasonal schedule. If people did visit, their numbers may have been very small and their presence brief. Their relationship to local animals could have ranged from opportunistic scavenging to hunting, but the Irish evidence does not yet decide between those possibilities.

No Politics, No Trade Network

Terms such as political affairs, diplomacy and warfare have no secure application to Ireland at this depth of time. There were no recorded kingdoms, chiefs, boundaries or treaties, and archaeology has not revealed a settlement landscape from which institutions can be inferred. Nor is there evidence for an Irish exchange network, mining economy or agriculture. The economy that can cautiously be discussed is ecological: grazing animals consumed the productive patches of cold open vegetation; carnivores and scavengers followed animal herds and carcasses; people, if present, would have depended on mobile resources rather than crops or livestock.

Connections beyond Ireland remain an important question, but not a licence for certainty. Lower global sea levels altered the geography of the continental shelf and reduced some sea distances. Ice extent, coasts, rivers and the Irish Sea changed through time, however, and the precise accessibility of Ireland at this particular horizon is unresolved. Fossil animals prove dispersal occurred in some form. They do not prove a continuous land bridge, a specific migration corridor or human travel by a particular route. In this period, the island's changing position within a wider north-west European environment is better understood as a research problem than as a fixed map.

What This Year Can Mean

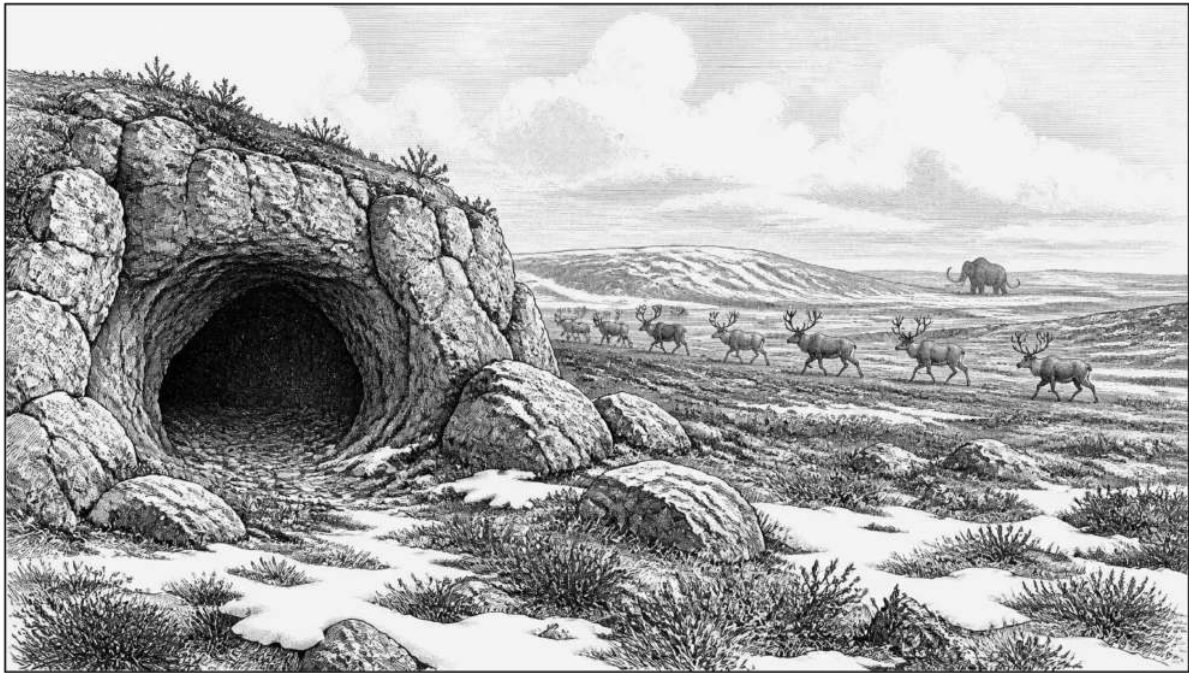
The chief development represented by 31,908 BCE was environmental, not political: Ireland stood within a volatile phase before the major expansion of the last British–Irish Ice Sheet. Derrynvree preserves evidence that an ice-free Fermanagh supported cold wetlands and tundra vegetation during a calibrated interval encompassing this nominal date. Castlepook, though chronologically and stratigraphically more complex, shows that mammoth, reindeer and formidable predators formed part of Ireland’s wider Pleistocene history. Together, these records replace an empty frozen island with a more dynamic picture – but not with a conventional historical narrative.

That distinction matters. Archaeological evidence can responsibly illuminate land, water, vegetation, animals and the possibility of fleeting human activity. It cannot give Ireland of 31,908 BCE a government, a battle, a religion or an economy of trade. The surviving traces are sparse because later ice eroded landscapes and because caves preserve only selected remains. Their value lies not in supplying false precision, but in showing that long before farms, monuments and written names, Ireland repeatedly became a contested ecological frontier between habitable tundra, mobile fauna and encroaching ice.

Chapter 094 of 100

31907 BCE

The Castlepook Question^[94]



The label “31,907 BCE” gives a useful position in a modern chronological sequence, but it must not be mistaken for a date at which an event can be recorded. No calendar, written testimony, named individual or year-by-year history exists for Ireland at this depth of time. In archaeological terms, the point falls broadly around 34,000 calendar years before present, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), a long, climatically unstable part of the last Ice Age. Radiocarbon ages of this antiquity require calibration and have ranges rather than single precise equivalents. The responsible history of Ireland at this moment is therefore an account of landscapes, animal remains, sediments and one exceptionally debated possible trace of people.

A Date Between Dating Ranges

“Before present” conventionally means before AD 1950, whereas BCE dates are a later conversion. Around 34,000 years ago, even well-preserved organic material does not yield calendar precision of the kind implied by a numbered year. Atmospheric radiocarbon varied through time, and the calibration curve becomes especially consequential beyond 30,000 calendar years ago. A bone’s laboratory result, its calibrated range, the layer from which it came and the possibility of later disturbance all need separate consideration. Consequently, this article uses “around”, “about” and calibrated ranges where the evidence permits; it does not claim that any animal, group or occurrence can be assigned to 31,907 BCE itself.

The broader period is clearer. MIS 3 is generally placed between roughly 59,000 and 29,000 calendar years before present. It was cold by modern standards, yet not uniformly like the later Last Glacial Maximum. Northern climates repeatedly changed on millennial scales between relatively milder

interstadials and severe stadials. Ireland's terrain, sea routes, vegetation and animal populations were therefore not fixed. A single Irish site may preserve a snapshot from one episode rather than a picture of the whole island or of every century surrounding it.

Land Before the Great Ice Advance

Ireland was approaching, but had not yet reached, the fullest expansion of the last British–Irish Ice Sheet. Later glaciation would profoundly remodel the country, stripping and redepositing sediments across extensive areas and greatly reducing the chances that open-air camps would survive. Reconstructions of the last ice sheet place widespread major advance later, with maximum extent and subsequent retreat belonging chiefly to the period after about 27,000 years before present. This does not mean all Ireland was ice-free around 34,000 years ago: local and regional glacier behaviour remains complex. It does mean that the familiar image of an island entirely smothered beneath its final ice cover is unsuitable for every part of the preceding millennia.

Sea level was far lower than today, exposing much more of the continental shelf. Ireland's shoreline was consequently unlike the modern coast, and western Britain, the Irish Sea basin and the lands now below the Celtic Sea formed a different geographical setting. Yet lower seas do not automatically demonstrate a walkable land bridge from Ireland to Britain or continental Europe at this specific time. Water crossings, islands, marine channels, ice margins and changing coastal plains must be reconstructed locally. The movement of large terrestrial mammals proves that colonisation routes existed at some stages; it does not by itself reveal precisely how or when a human party might have travelled.

Derryvree's Cold Freshwater World

The best environmental evidence relevant to this broad interval comes from places beyond the famous Cork caves. At Derryvree near Maguiresbridge in County Fermanagh, workers found organic silts and fine sands enclosed between two till sheets. The deposit produced a radiocarbon age of 30,500 radiocarbon years before present, with a substantial laboratory uncertainty, rather than a direct date for the numbered year considered here. Its flora and fauna nevertheless offer a valuable regional analogue for a cold Late Pleistocene Ireland. The researchers interpreted the setting as open tundra under a periglacial climate: ground subject to intense freezing and thawing, not a wooded landscape resembling modern Fermanagh.

Plant remains from Derryvree included species capable of enduring harsh northern conditions, such as dwarf willow, mountain avens and bogbean. The evidence suggests low, open vegetation around freshwater, with herbs, sedges and dwarf shrubs rather than closed forest. Such terrain could sustain grazing and browsing animals, while seasonal snow, frozen ground, wind exposure and short growing seasons constrained life. It also cautions against treating the entire island as a uniform "mammoth steppe". Local relief, water, soil, snow cover and proximity to ice would have made different districts more or less hospitable at different times.

Castlepook's Animal Archive

The strongest Irish evidence for this era is concentrated in Castlepook Cave, also known as Mammoth Cave or Doneraile Cave, near Doneraile in north County Cork. Nineteenth- and early twentieth-century excavations recovered a remarkable quantity of animal bone from its chambers, including areas

remembered as Elephant Hall and Hyaena Hall. Later assessment and direct dating transformed the importance of collections that had long been known but inadequately understood. Castlepook is Ireland's richest major archive for Pleistocene vertebrates, although its value is inseparable from its problems: old excavations often lack the detailed stratigraphic recording expected today, and material from disturbed deposits may not all be contemporary.

The pre-Last Glacial Maximum fauna associated with Castlepook includes woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, mountain hare, stoat, collared lemming, Norwegian lemming and spotted hyaena. Some species are dated at other points within the broad Late Pleistocene sequence rather than precisely to c. 34,000 calendar years ago. Their presence should not be compressed into a single imagined encounter. Still, together they establish that Ireland could support a much richer cold-climate mammal community than its later historical fauna suggests. Mammoth and reindeer indicate open feeding country; lemmings and Arctic fox point towards severe conditions; large predators and scavengers signal food webs with substantial carcasses and prey.

Spotted hyaena is particularly revealing. Castlepook's assemblage includes hyaena remains and bones bearing evidence consistent with carnivore activity. A cave can be a den, a shelter, a trap, a place where bones were dragged in, or a sedimentary storehouse receiving material from several processes. It is not automatically a human home. The assemblage thus tells an ecological story of predators, scavenging and repeated animal use of limestone country. It does not establish villages, hunting territories or a settled human population.

The Mark on a Reindeer Bone

One fragment gives this period unusual archaeological significance: a reindeer femur from Castlepook, re-examined by the palaeozoologist Ruth Carden. It bears a deep mark interpreted as potentially consistent with cutting or chopping fresh tissue using a broad stone tool. Public reporting of the direct date has placed the bone at about 33,000 years ago. If the modification was made by people and belongs to the time when the reindeer was processed, it would be evidence for human activity in Ireland tens of millennia earlier than the island's previously accepted terminal Palaeolithic record.

That conditional language is essential. A marked bone is not the same as a securely excavated hearth, a worked-flint assemblage, human remains or a dated occupation surface. Castlepook's historical excavation and complex deposits make association difficult. Stone tools can leave distinctive traces, but carnivore teeth, trampling, sediment movement, excavation damage and old handling must all be excluded carefully. Nor does one processed animal prove permanent settlement. At most, the finding may indicate a brief visit by Upper Palaeolithic hunter-gatherers who obtained or encountered a reindeer carcass. Whether they hunted it, scavenged it, returned repeatedly, travelled by sea or crossed a changing coastal landscape remains unknown.

Society Without a Social Record

There is no evidence for political communities, chiefs, diplomacy, warfare, named groups, religious rites, artistic traditions, teaching systems, trade networks or formal settlements in Ireland at this time. To supply them would be invention. If people were present, they would have belonged to the wider world of Upper Palaeolithic north-west Europe, where mobile hunter-gatherers possessed sophisticated knowledge

of animal behaviour, seasonal terrain and stone-working. But Ireland has not yielded a securely dated toolkit that identifies a particular cultural tradition around 34,000 years ago. It has no established cave art, dwelling, burial, shrine or exchange object of this age.

Everyday life can therefore be discussed only as a possibility grounded in regional comparison, never as a documented Irish scene. Small, mobile parties in cold Europe commonly relied on clothing, fire, cutting tools and flexible use of animal and plant resources. In Ireland, any such group would have needed to negotiate unpredictable weather, exposed ground and the presence of formidable carnivores. Caves may have offered temporary shelter, but Castlepook's evidence more securely records animals than people. A reindeer femur with a possible tool mark is meaningful precisely because the rest of the expected archaeological signature has not yet been found.

Regional Change and Historical Limits

The most important development around this notional year was environmental rather than political: a habitable but severe Irish landscape was moving towards the much harsher glacial conditions of the Last Glacial Maximum. Animal populations evidently reached Ireland during favourable windows, but later ice expansion would fragment habitats, alter coasts and erase or bury evidence. This helps explain why Irish Palaeolithic archaeology is so sparse compared with that of Britain and continental Europe. Absence of evidence cannot prove that no people ever arrived, but neither can it be filled with attractive certainty.

For Ireland around 31,907 BCE, the honest conclusion is both modest and remarkable. The island was part of a changing Ice Age world, with open cold-country vegetation and a fauna including reindeer, mammoth and hyaena. Fermanagh sediments and Cork cave bones illuminate that world through date ranges, not annual history. Castlepook offers a serious, unresolved possibility that people briefly entered it. Future stratified excavation, microscopic study of bone surfaces, ancient-DNA work and improved dating may strengthen, revise or reject that interpretation. Until then, the Castlepook reindeer bone remains not a foundation myth, but a compelling question at the edge of Ireland's recoverable past.

Chapter 095 of 100

31906 BCE

Muskeg Beneath Fermanagh^[95]



31,906 BCE is a modern calendar label, not a year for which Ireland possesses an event-by-event history. There were no written records, named peoples, governments or dated monuments on the island. Nor can archaeological science identify something that happened in one particular calendar year so deep in time. Converted simply to the conventional archaeological reference point of AD 1950, the label lies about 33,855 years before present; it should be treated as a broad horizon around 34,000 calibrated years BP, not as a precise anniversary. At this age, calibrated ranges commonly span centuries or longer, and deposits may record episodes separated in time.

That horizon falls within the Late Pleistocene, during Marine Isotope Stage 3, in the long climatic descent towards the Last Glacial Maximum. In Irish terminology it belongs to the Midlandian glacial cycle. Ireland was not the settled, wooded island familiar from later prehistory. Its landscapes were repeatedly reshaped by cold, ice, wind, meltwater and changing sea levels. Yet the evidence does not justify a simple picture of an island uniformly sealed beneath ice in 31,906 BCE. The extent and timing of the growing British–Irish Ice Sheet differed by region, and the best local records instead reveal a harsh but locally ice-free environment in parts of Ireland during the wider interval.

Time Measured in Deposits

The most useful evidence near this date comes from Derryvree, close to Maguiresbridge in County Fermanagh. There, freshwater organic silts survived between two layers of glacial till. This is an exceptional piece of geological good fortune: later ice both erased much evidence elsewhere and sealed this small archive below its debris. A radiocarbon determination of $30,500 \pm 1,200$ radiocarbon years BP

from the Derryvree series calibrates broadly to about 36,900–31,700 cal BP. That range encompasses the chronological neighbourhood of 31,906 BCE, though it cannot prove that every fossil in the deposit lived in that nominal year.

The Derryvree plants, pollen, mosses and insects indicate treeless, open ground with wet hollows and pools rich in plant material: a cold muskeg or tundra-like mosaic rather than forest. Grasses, sedges, juniper and herbs occurred alongside plants now associated with Arctic-alpine or wetland settings, including mountain avens, dwarf willow and bogbean. Insect evidence supports the picture of freshwater pools bordered by mossy vegetation. The cautious conclusion is strong enough to be vivid: at least in this part of Fermanagh, plants and small animals occupied a severe, periglacial landscape despite bitter winters.

It would be wrong, however, to project Derryvree unchanged across every Irish county. Palaeoenvironmental records are local, while the ice sheet and climate were dynamic. A pool-side community in Fermanagh does not tell us the exact character of exposed ground in Cork, the west coast or the Irish Sea basin. Its importance is that it decisively complicates the old assumption that late Ice Age Ireland was an ecological blank. Around the broad interval represented by this article, there were places where freshwater, vegetation and terrestrial life persisted.

Castlepook's Animal World

In southern Ireland, the limestone caves at Castlepook near Doneraile, County Cork, preserve the most celebrated evidence for this earlier Ice Age fauna. Antiquarian excavators removed a very large collection of bones from the cave system in the late nineteenth and early twentieth centuries. Subsequent study has identified a remarkable range of mammals, including woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Not every species need have been present together, and not every specimen belongs to the same climatic episode; a cave collection is an accumulated record, not a snapshot.

Even so, the assemblage demonstrates that Ireland could support a varied cold-stage animal community before the fullest glaciation. Mammoth and reindeer suggest open habitats capable of sustaining grazing herds; lemmings, hares and Arctic fox speak to cold conditions and low vegetation; bears and wolves remind us that a food web includes predators and opportunists as well as prey. Spotted hyaena is particularly significant. Its bones, tooth marks and droppings show that Castlepook was at times used as a den or scavenging place. Hyaenas could carry carcass parts into caves and gnaw them intensively. Therefore, animal bones found there do not automatically record animals dying in place, much less people hunting them.

Radiocarbon programmes have altered the chronology of the southern cave faunas. Early determinations from Castlepook already suggested a Middle Midlandian antiquity for mammoth and hyaena. Improved pretreatment and accelerator dating have since shown that several older Irish cave dates were too young, placing important Castlepook animals more securely within Marine Isotope Stage 3. Some results indicate that species such as giant deer and spotted hyaena disappeared locally before the Last Glacial Maximum, around 40,000 calibrated years ago. The consequence is not a neatly dated animal parade for 31,906 BCE, but a better-founded recognition that the Irish fauna had a deeper and more complex history than once thought.

A Possible Human Trace

Castlepook also matters because a reindeer femur from the old collection has been reported as bearing a mark consistent with cutting by a sharp stone tool. Its date has been publicised as about 33,000 BCE, making it broadly relevant to the period under discussion. If microscopic and contextual scrutiny ultimately confirms that the mark was made by people while processing a fresh carcass, it would be evidence that Upper Palaeolithic visitors reached Ireland vastly earlier than the formerly accepted late-glacial evidence.

The conditional language is essential. The bone came from an old excavation, rather than a modern, closely recorded archaeological layer. No securely associated hearth, stone-tool assemblage, dwelling floor, human burial or repeatedly used butchery site of comparable age has yet been recovered at Castlepook. Nor does one modified bone demonstrate a resident population. It may indicate a short visit by a small party, or it may require reinterpretation as research continues. The responsible historical position is that the femur is an important and promising possible sign of human activity, while sustained settlement in Ireland at this date remains unproven.

This uncertainty is heightened by geography. Lower sea levels and altered ice margins changed the outline of the Irish region, but modern coasts are a poor guide to the terrain, shorelines and crossings of the time. Nor can a dry land connection be assumed merely because large mammals reached Ireland. The routes by which animals and any people travelled, whether across temporary ice, narrow waters or changing coastal landscapes, remain unresolved. Later glaciation also destroyed or buried many potential sites, making absence of evidence a less decisive argument than it might otherwise be.

No Kingdoms, No Trade Network

There is no evidence for political affairs in Ireland around 31,906 BCE: no chiefs, tribes, boundaries, diplomacy, warfare or institutions can responsibly be named. The same is true of religion, language, art and formal learning. Caves may later acquire cultural meanings, but Castlepook's evidence at this depth is principally palaeontological and geological. It cannot demonstrate ritual activity. Likewise, there is no Irish evidence for farming, herding, houses, pottery, metalworking, exchange networks or trade at this time. To supply any of these from better-known Upper Palaeolithic Europe would turn analogy into invented Irish history.

If people did visit, the reindeer bone permits only the narrowest economic inference: animal carcasses may have been a source of meat, hide, sinew, marrow or bone. Such uses are plausible for hunter-gatherers elsewhere, but they have not been excavated as a complete activity area in Ireland. Everyday life is more securely illuminated through the non-human record: animals navigating open country, predators using shelter, and plants surviving in wet ground through a demanding climate.

Approaching a Landscape Transformation

The larger development was environmental. The British–Irish Ice Sheet was building towards a much more extensive phase, although its advance was not simultaneous in every sector. Research based on landforms, offshore sediment cores and extensive dating programmes places the ice sheet's maximum volume later, around 23,000 years ago, while margins advanced and retreated at different times between

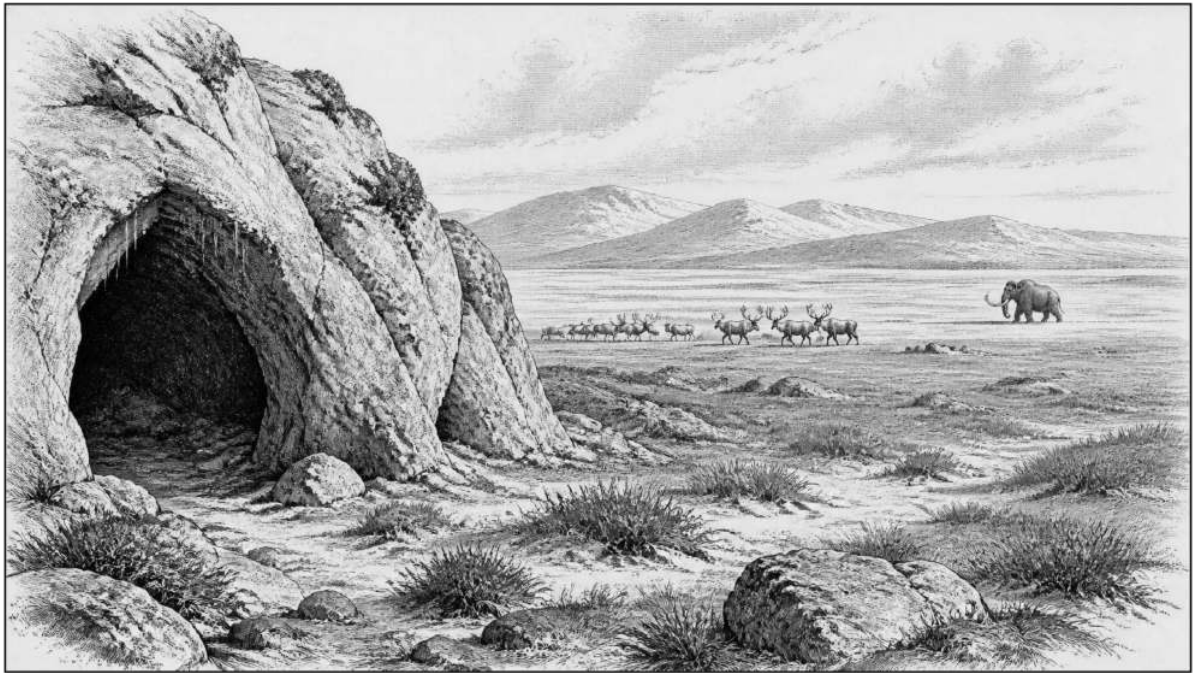
roughly 30,000 and 22,000 years ago. Near 31,906 BCE, Ireland stood in a transition: parts of its landscape still offered habitat and freshwater, but the forces that would scour, bury and reorder the island were gathering strength.

That future ice explains the peculiar shape of the evidence. Derryvree's buried silts and Castlepook's protected cave deposits are survivors of a record otherwise stripped by glaciers and erosion. They do not furnish a conventional annual chronicle. They offer something more fragmentary but still profound: proof that Late Pleistocene Ireland was a changing ecological frontier, inhabited certainly by cold-adapted animals and perhaps briefly visited by people, on the eve of a glacial transformation that would remove much of the evidence of both.

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31905 BCE

Elephant Hall's Mammoth Bone^[96]



The label 31,905 BCE offers a misleading degree of precision. No Irish written record, annually layered settlement sequence, named community or datable historical event can be assigned to this particular year. In archaeological terms it falls broadly around 33,850 years before present, conventionally measured from 1950, during the Late Pleistocene and Marine Isotope Stage 3 (MIS 3). That is useful orientation, not an anniversary. Radiocarbon determinations must be calibrated against changing atmospheric carbon levels, and the results are expressed as probability ranges rather than exact calendar years. The responsible question is therefore not what happened in Ireland in one year, but what its surviving geological and faunal evidence can say about the island around this part of the Ice Age.

A Far-Northwestern Landscape

Ireland lay at the north-western edge of the European landmass and climatic system. Sea levels were substantially lower than now because large quantities of water were locked in global ice sheets. The present Irish Sea and Celtic Sea were altered landscapes, with exposed shelf in places and changing routes between Ireland, Britain and continental Europe. Yet lowered sea level did not automatically mean an easy or permanent dry crossing. The configuration of coasts, rivers, estuaries, sea ice and local ice margins changed through time, while Ireland's relation to Britain was shaped by a complicated, mobile glacial environment.

Nor was the island uniformly buried beneath ice at this moment. The full Last Glacial Maximum, when the British-Irish Ice Sheet reached its greatest late-glacial extent, came later, broadly after about 26,500 years ago. Evidence from caves and buried terrestrial deposits shows that, during portions of MIS 3, some Irish landscapes could support vegetation and large mammals. Exactly which districts were ice-

free at any short-lived interval remains debated. Ice sheets advanced and retreated; periglacial conditions could dominate beyond their margins; and later glaciation stripped away or redeposited much of the evidence that might once have existed.

Derryvree's Buried Tundra

The clearest environmental evidence relevant to this date comes not from a settlement but from a buried deposit at Derryvree near Maguiresbridge, County Fermanagh. Roadworks exposed freshwater silts and fine sands enclosed between two separate tills within a drumlin. Organic material from the deposit returned a conventional radiocarbon determination of 30,500 years BP, with an uncertainty of +1,170 and -1,030 years. Later calibration places the age broadly within about 31,700–36,900 calibrated years BP. The modern year 31,905 BCE, approximately 33,850 years before present, falls within that broad chronological neighbourhood, but cannot be pinpointed inside it.

The plants and small animals preserved in the Derryvree sediments indicate open tundra and a periglacial regime: ground subject to intense frost, short growing seasons and little or no woodland. Grasses, sedges, juniper and herbaceous plants were important components of this landscape, alongside mosses. This was not the green, wooded Ireland familiar today, nor an utterly lifeless polar desert. It was a sparse, wind-exposed terrain in which wet hollows and shallow freshwater environments could preserve organic remains. Such evidence provides a local environmental record, not a complete map of the island; nevertheless, it demonstrates that at least part of Ulster had a treeless cold-stage ecosystem during a period close to this one.

Other Fermanagh sites add depth and caution. Organic beds at Greenagho, near Belcoo, and at Hollymount and Aghnadarragh have yielded pollen, insects and sediments associated with changing Middle Midlandian conditions. Their chronologies and correlations are not all equally secure. Taken together, they suggest that Irish climate during MIS 3 did not follow one uninterrupted descent into maximum cold. It fluctuated sharply, and local environments responded differently to changing moisture, temperature and ice extent. Calcite formations in Crag Cave, County Kerry, offer independent evidence of this instability: episodes of speleothem growth indicate intervals when water could percolate through the limestone, while growth stopped during harsher Greenland stadials.

The Cave Fauna of North Cork

For southern Ireland, Castlepook Cave near Doneraile, County Cork, is the crucial site. Known historically as Mammoth Cave, its chambers include the evocatively named Elephant Hall. Excavations in the late nineteenth and early twentieth centuries, followed by later work, recovered a remarkable assemblage of Ice Age animal remains. They include woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, spotted hyaena and lemmings. Not every specimen came from a sealed modern excavation, and the cave's deposits were accumulated, disturbed and investigated over a long period. Consequently, the assemblage must not be treated as a photograph of a single moment or an intact animal community living together on one day.

Nevertheless, the fauna establishes something important. Ireland was not biologically isolated from the wider north-west European cold-stage world. Reindeer and mammoth imply substantial grazing country; lemmings and Arctic fox point to cold, open habitats; wolves, bears and hyaenas occupied higher levels of the food web. The presence of spotted hyaena is particularly striking. Caves were not necessarily

places where these animals died naturally: carnivores could transport bones into dens, and water, collapse and later digging could move them again. Elephant Hall's mammoth bone is therefore evidence for an Ice Age animal, not proof that mammoths inhabited that particular chamber.

Recent redating has made the chronology more complicated but more reliable. Improved pretreatment of bone collagen has shown that several older Irish cave radiocarbon results were too young, in some cases by thousands of radiocarbon years. Reassessment of material from Castlepook, Foley and Shandon caves places portions of the southern Irish fauna firmly within MIS 3 and suggests that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum. The lesson is methodological as well as chronological: a famous specimen may remain valuable while its date, depositional history and interpretation require revision.

A Possible Human Trace

Castlepook also matters because a reindeer femur from its old collections has been reported as bearing a mark consistent with cutting by a sharp stone tool. It has been presented as possible evidence that Upper Palaeolithic hunters processed a reindeer in Ireland roughly 33,000 years ago. If that interpretation is sustained, it would extend the island's known human story enormously beyond the post-glacial hunter-gatherer settlement usually represented by Mount Sandel, which began many millennia later.

The qualification is essential. A modified animal bone is not a campsite. No securely associated hearth, lithic assemblage, human skeleton, dwelling floor, art panel or stratified occupation surface has yet demonstrated a settled human presence in Ireland around 31,905 BCE. Natural damage, carnivore activity, sediment movement and the limitations of antiquarian excavation all require scrutiny when assessing marks on bone. Current fieldwork at Castlepook seeks undisturbed deposits and the kinds of associated evidence that could test the claim. At present, the strongest formulation is that the bone may record a brief episode of human butchery or carcass processing, rather than a permanent population.

Life Without a Recorded Society

If people did reach Ireland during this phase of MIS 3, they would have been highly mobile hunter-gatherers operating within a severe and variable environment. Their practical concerns would have included locating game, fuel and shelter, reading seasonal conditions, and maintaining contact with other groups beyond the island. Reindeer would have supplied meat, fat, hides, sinew, antler and bone; carcasses of other large animals could also have been valuable. These are reasonable inferences from Upper Palaeolithic lifeways elsewhere in north-west Europe, not directly documented facts about a named Irish group.

There is no evidence here for farms, herds of domestic animals, fields, pottery, metalworking, villages, chiefs, kingdoms or formal institutions. Equally, there is no evidence from which to reconstruct political affairs, diplomacy, organised warfare, law, religion, language or ritual in Ireland at this date. A cave bone cannot reveal whether a hunting party travelled alone, cooperated with neighbouring groups, crossed from Britain, or returned home after a short visit. It cannot tell us whether people and hyaenas used the cave in the same generation, let alone encountered one another.

Trade must also be approached negatively. The Island's position made movement across the surrounding landscape and waters consequential, but there are no Irish objects from this period that demonstrate an exchange network. Stone tools, if future excavations recover them in secure context, might reveal raw-material sources and technological links. Until then, the possibility of travel is stronger

than evidence for commerce. Knowledge, culture and learning were almost certainly carried in bodies, skills, stories and social relationships rather than writing, but none of these leaves an identifiable record at Castlepook or Derryvree.

What This Year Can Mean

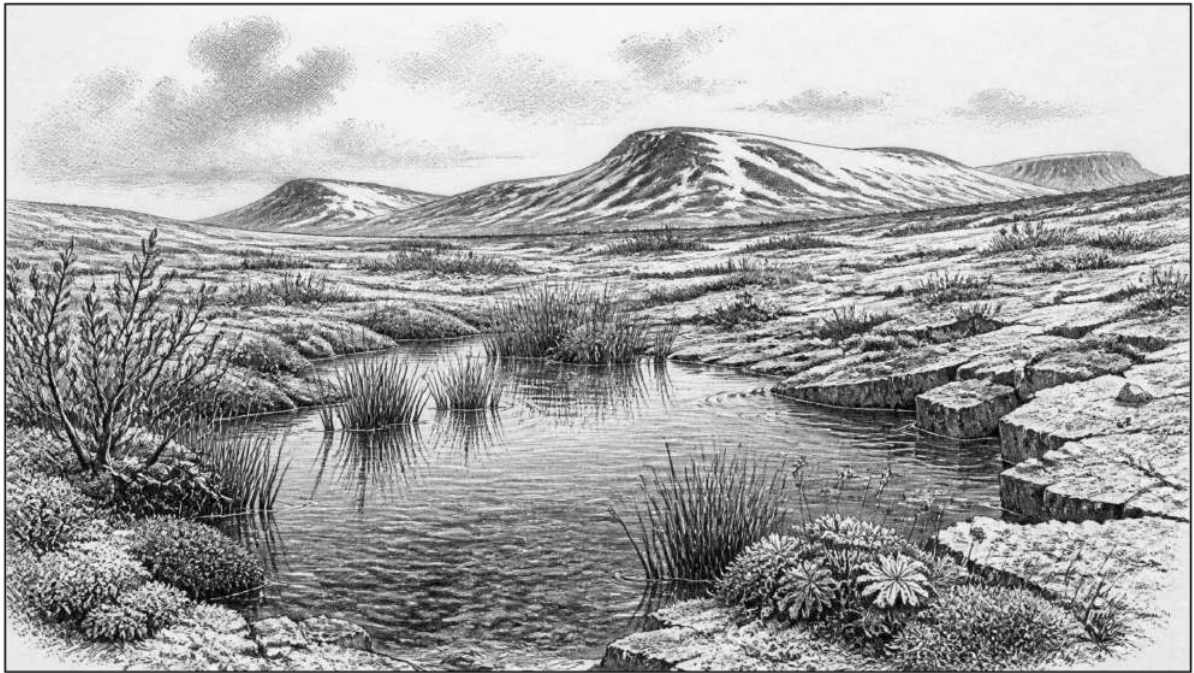
Around the modern label 31,905 BCE, Ireland should be understood as a changing cold-stage landscape rather than a country with a recoverable annual history. In Fermanagh, freshwater silts preserve evidence of treeless tundra between episodes of glaciation. In north Cork, cave deposits retain the remains of animals adapted to a cold, open world and a tantalising possible sign of human action. The evidence is important precisely because it is so limited: it shows that Ireland had ecological connections to Pleistocene Europe and may have received rare human visitors long before the better-attested post-glacial settlement.

It does not warrant a story of continuous occupation or an invented Ice Age community. The next advances will depend on carefully excavated contexts, modern dating, microscopic analysis of bone surfaces, environmental DNA where preservation permits, and comparison with Britain and continental Europe. For now, Elephant Hall's mammoth bone and Derryvree's buried tundra offer the most responsible portrait: not a known event in a known year, but fragments from a deep past in which ice, grassland, animals and perhaps passing hunters shaped Ireland's earliest recoverable horizon.

Chapter 097 of 100

31904 BCE

Derryvree's Periglacial Waters^[97]



The number 31,904 BCE is useful as a point of orientation, but it cannot describe a known year in Irish prehistory. No written calendar, settlement sequence or annually resolved archive allows events in Ireland to be placed in that single modern year. In archaeological terms it falls roughly 33.9 thousand calendar years before present (cal BP, where “present” is conventionally AD 1950), within the later part of Marine Isotope Stage 3 (MIS 3), a long and climatically unstable interval of the Last Glacial Period. The responsible history of Ireland at this date is therefore a history of dated deposits, bones, landforms and uncertainties—not of named people, campaigns or governments.

A Date Within a Range

The closest important environmental archive is at Derryvree near Maguiresbridge in County Fermanagh. There, freshwater silts and organic layers were preserved between two glacial tills: deposits left by ice advances before and after the quieter interval in which the sediments accumulated. A radiocarbon determination from the organic series, once calibrated, has been published as approximately 36.9–31.7 thousand cal BP. That is a broad range, but it encompasses the notional date of 31,904 BCE. Derryvree consequently provides a more responsible guide to conditions around this point than an attempt to assign a precise seasonal scene to the whole island.

Its evidence is local and time-averaged. The deposits contain freshwater plant remains, mosses and sedges, alongside insects indicative of cold northern conditions. Fossil records associated with the sequence include plants such as mountain avens and dwarf willow. Together they support an interpretation of open, cold, periglacial terrain around freshwater pools, wet hollows and channels. “Periglacial” does not mean continuously ice-covered: it denotes a landscape strongly affected by severe frost, seasonal thaw, sparse vegetation and ground disturbance in the vicinity of ice-sheet climates.

The inference must nevertheless be kept in proportion. Derryvree does not prove that every valley in Ireland looked identical, or that those particular plants grew at every spot at the same moment. Pollen can travel far from its source; plant and insect remains may derive from a catchment rather than a single patch of ground; and a deposit spans years or centuries. What it does securely demonstrate is that north-central Ireland retained environments capable of sustaining freshwater and tundra-associated life during part of this cold stage.

An Island Not Yet Overrun

Ireland was approaching, rather than already at, the maximum extent of the last British–Irish Ice Sheet. Later in the glacial cycle, especially between about 27,000 and 23,000 cal BP, ice expanded dramatically and covered most of the island. Newer reconstructions show that its growth, maximum and retreat were not simultaneous in every sector. At roughly 33.9 thousand cal BP, the picture was consequently regional: older ice had shaped the land, while later ice had not yet erased all the organic records from which this history is reconstructed.

The Derryvree evidence has been used to argue that north-central Ireland remained ice-free until at least about 34,000 years ago, before the main build-up of the last Irish ice sheet. Its calibrated uncertainty overlaps the date considered here, so it cannot establish an exact ice margin for 31,904 BCE. Still less can it supply a national weather report. The strongest conclusion is that there were ice-free or seasonally non-glacial landscapes in Ireland during this broad interval, but that conditions were changing towards more extensive glaciation.

Coastlines were also unlike those of modern Ireland. Global sea level was lower because immense volumes of water were locked in continental ice sheets, exposing parts of the surrounding continental shelf. Whether a particular route between Ireland, Britain and the European mainland was dry ground, glacier, shallow sea, islands or impassable water depended on local relief, ice loading and relative sea level. Models and geological interpretations differ in detail. It is reasonable to see Ireland as less geographically isolated than today in some phases of the Ice Age; it is not reasonable to draw a certain road, migration route or shore for this one numbered year.

Animals in a Fragmentary Record

Caves in southern Ireland provide the principal evidence for the island's larger Pleistocene mammals. Castlepook Cave near Doneraile in County Cork, together with caves in Cork and Waterford, has yielded remains attributed to mammoth, reindeer, brown bear, giant deer, spotted hyaena, wolf and other animals. The wider Irish Quaternary Fauna Project concluded that a varied mammal fauna reached Ireland between at least about 45,000 and 20,000 years ago. These animals were part of northern European ecological networks, not creatures confined to an isolated Irish refuge.

Yet cave bone collections are not census lists. Animals may have died naturally, been dragged in by carnivores, accumulated in dens, moved by water or disturbed by excavation. Much Castlepook material was recovered in early twentieth-century work, before modern standards of stratigraphic recording. Later accelerator radiocarbon dating and improved collagen pretreatment have revised several earlier results, in some cases making specimens thousands of radiocarbon years older than previously thought. The revised work indicates that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum, around 40,000 cal BP.

Accordingly, a mammoth, bear or reindeer may be historically appropriate to the wider Irish MIS 3 landscape, but none can be placed confidently at Derryvree—or on a particular day in 31,904 BCE. The animal evidence does, however, overturn any image of an entirely lifeless island. Cold-adapted and temperate-tolerant mammals entered and vanished as habitats, sea barriers and ice margins changed. Their survival required forage, freshwater and traversable routes, even if those routes remain imperfectly known.

The Question of People

No established settlement, hearth, stone-tool assemblage or burial demonstrates a resident human population in Ireland at this time. The National Museum of Ireland has accordingly described the Palaeolithic human record as lacking clear evidence, and the earliest substantial evidence for settled lifeways belongs vastly later, in the Mesolithic after the ice sheets had retreated.

There is, however, an important and unresolved qualification. A reindeer femur from the Castlepook collection has been reported as bearing marks consistent with butchery by a stone tool and as dating to roughly 33,000 years ago. If both the identification of the marks and their association with the animal's death are upheld, it would indicate a brief Upper Palaeolithic human presence or visit in Ireland during the broad period under discussion. It would not demonstrate a village, a continuous population or activity precisely in 31,904 BCE. Nor does it identify the hunters, their language, their route or the scale of their expedition.

Recent fieldwork at Castlepook has sought surviving Pleistocene sediments, precisely because the old collections leave such questions open. The 2022 investigation confirmed archaeological potential but also encountered disturbed deposits and modern material. Future securely stratified finds, microscopic analysis of bone surfaces, direct dating and ancient DNA may clarify the issue. For now, the reindeer bone is best treated as a significant reported indication, not as licence to write a settled human history for Ice-Age Ireland.

Society Beyond the Evidence

Political affairs, diplomacy, religion, learning, trade and conflict cannot be reconstructed for Ireland around this date. There are no contemporary names, monuments, territories, prestige goods or formal places of worship. If people did enter the island, they would have belonged to mobile Upper Palaeolithic hunter-gatherer worlds known elsewhere in north-west Europe, but importing the social arrangements of Britain or the continent into Ireland would be interpretation rather than evidence. Even a single instance of carcass processing would show only an episode of practical activity: the acquisition or scavenging of meat, hides, marrow or bone, perhaps by a very small party.

The most defensible account of everyday life is therefore environmental. In the Derryvree-type landscape, exposed ground, wetlands and freshwater would have mattered; cold, wind, frost and seasonal scarcity would have shaped the possibilities for plants and animals. There is no evidence for farming, domesticated stock, permanent houses, pottery, metalworking or long-distance exchange systems on the island. There is equally no basis for imagining kingdoms, tribes with recorded names, or ritual sites. Silence in this case is not a minor gap in a narrative: it is the central fact.

What Survived

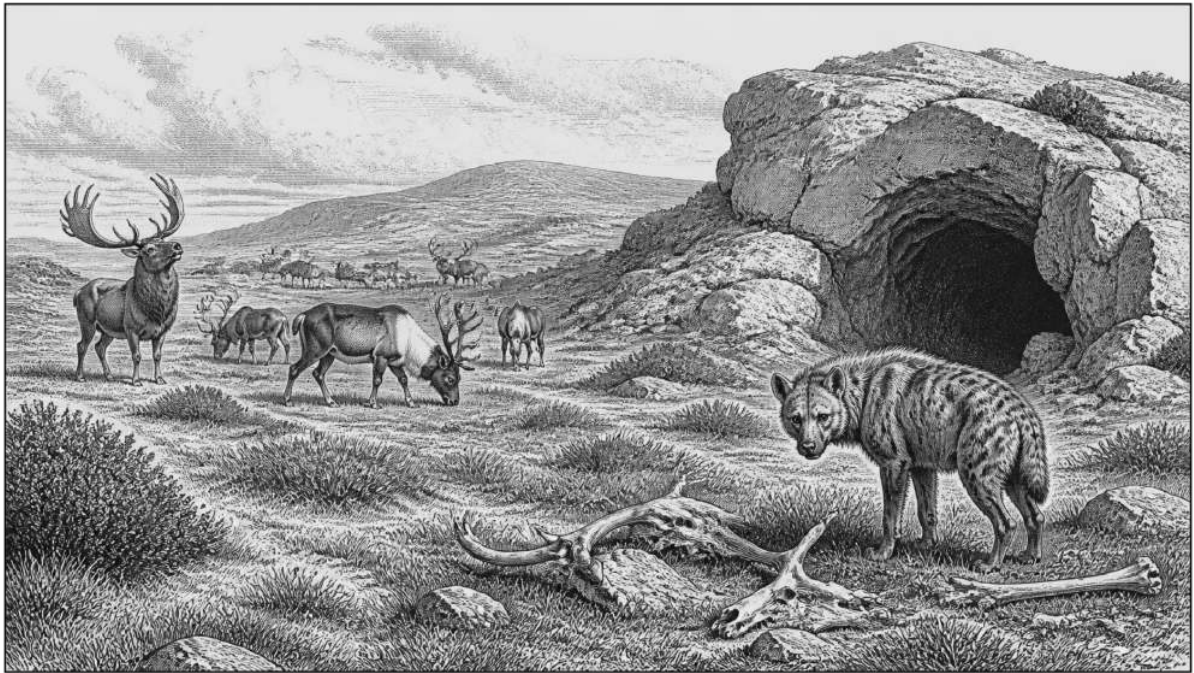
The history of 31,904 BCE in Ireland survives indirectly because later ice did not destroy every cave bone and every buried freshwater layer. Derryvree's organic sediments preserve a narrow but invaluable glimpse of cold, open ground and water in a changing glacial landscape. Castlepook and related caves preserve evidence that varied mammals reached the island, while also demonstrating how difficult it is to turn cave collections into exact chronologies. The date belongs not to an Irish "year of events", but to an interval in which Ireland was ecologically inhabited, geographically mutable and moving towards the full force of the last ice-sheet advance.

That is a demanding history, but an engaging one. The absence of kings and chronicles makes the physical evidence more important, not less. A seed, beetle wing-case, fragment of bone or layer of silt can establish what grand narratives cannot: that, around the modernly numbered year 31,904 BCE, parts of Ireland contained real waters, living vegetation and animal movement within an Ice-Age world whose local details remain only partly recoverable.

Chapter 098 of 100

31903 BCE

Hyaena Hall's Open Country^[98]



The label 31,903 BCE is a modern chronological convenience, not a year that can be isolated in Ireland's archaeological record. It corresponds very roughly to 33,850 years before AD 1950, but that conversion must not be mistaken for a precisely dated event. Radiocarbon ages require calibration against changing atmospheric carbon levels, and results are normally expressed as probability ranges rather than exact calendar years. For Ireland at this depth of time, the responsible unit of history is therefore a broad phase within the Late Pleistocene—Marine Isotope Stage 3 (MIS 3), conventionally c. 57,000–29,000 years ago—rather than a single calendar year.

A Date Within an Unstable Ice Age

MIS 3 was not a uniformly frozen world. Across north-west Europe it was marked by abrupt climatic oscillations, sometimes over centuries or millennia: comparatively milder intervals alternated with colder, drier phases. Ireland lay at the Atlantic edge of that unstable climatic system. Its eventual coverage by the last British–Irish Ice Sheet is beyond doubt, but the extent, timing and thickness of ice varied substantially between regions and through time. The best recent ice-sheet reconstruction begins at 31,000 years ago—later than the nominal year considered here—and shows ice building rapidly over Ireland and Britain thereafter. It cannot responsibly be used to draw a hard ice margin for 31,903 BCE.

The central fact is uncertainty with limits. The island was not yet the familiar temperate, wooded Ireland of the Holocene, and it was not necessarily a single, continuous white expanse at every moment. During less severe phases, portions of the landmass, especially in the south, could sustain cold-adapted animals. During colder advances, expanding glaciers and ice sheets reshaped or destroyed earlier

landscapes and deposits. That later glacial erosion is one reason the Irish record for this period is so sparse: absence of excavated evidence is not proof that nothing ever happened, but neither is it evidence for people, settlements or political communities.

Castlepook Cave's Long Record

The most important Irish evidence relevant to this era comes from Castlepook Cave near Doneraile in north County Cork. Its evocatively named passages—including Hyaena Hall and Elephant Hall—were investigated mainly in the early twentieth century. The cave produced a remarkable assemblage of more than 2,000 surviving animal bones, although far more were reportedly removed in the original excavations. It is Ireland's richest known vertebrate archive for the period leading towards the Last Glacial Maximum. Yet it is an archive, not a snapshot: bones were accumulated in different parts of the cave over a long interval, and the early excavations did not record stratigraphy to modern standards.

Older measurements once seemed to associate a Castlepook mammoth bone with an age of $33,500 \pm 1,200$ radiocarbon years before present, close enough to make this nominal date seem unusually tangible. Subsequent work has changed the picture. Improved collagen pretreatment and redating have shown that several legacy dates from southern Irish caves can be substantially too young; at Castlepook, revised results were between about 5,000 and 12,000 radiocarbon years older in particular cases. The current interpretation is that key fauna, including giant deer and spotted hyaena, may have disappeared locally before about 40,000 calibrated years BP. Thus neither the mammoth date nor the cave's species list can securely be assigned to 31,903 BCE.

This matters because careful prehistory separates evidence from illustration. Castlepook establishes that Ice Age mammals inhabited Ireland during parts of MIS 3. It does not establish that mammoths, hyaenas, reindeer and people all met outside the cave in one specified year. A cave bone may date an animal's death; its position may reflect scavenging, carnivore transport, sediment movement or nineteenth- and twentieth-century disturbance. The animal remains are powerful testimony to a vanished Irish ecology, but their mixture is also a warning against turning a long, complicated depositional history into a single dramatic scene.

Animals on the Irish Margin

The faunal record nevertheless allows a restrained reconstruction of the kind of open country that could develop during favourable MIS 3 intervals. Castlepook has yielded woolly mammoth, reindeer, giant deer (*Megaloceros giganteus*), brown bear, wolf, red fox, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena. These are not all necessarily contemporaneous. Together, however, they point to landscapes very different from modern woodland and pasture: largely open, cold environments with grasses, sedges, herbs, low shrubs and patches of more sheltered vegetation, capable of feeding large grazers and browsers.

Spotted hyaena is especially revealing. Modern assumptions that hyaenas belong only to warm African savannahs are misleading: Late Pleistocene spotted hyaenas ranged through parts of Europe and were well adapted to seasonal cold. At Castlepook, chewed bones and the composition of the assemblage support the interpretation that carnivores, particularly hyaenas, helped gather remains in the cave. They were hunters and scavengers, competitors with wolves and formidable processors of carcasses. The

presence of mammoth and giant deer need not mean that every animal was killed at the cave entrance; it means that large herbivore carcasses, or pieces of them, lay within reach of the cave's accumulating processes.

'Irish elk' is a familiar but misleading popular name for giant deer: the animal was neither uniquely Irish nor an elk in the modern North American sense. Ireland later became famous for its huge antlered remains, but the species ranged widely across Eurasia. Its appearance in the Castlepook record shows that the island, when accessible and ecologically suitable, formed part of a wider north-west European animal world. Lower sea levels exposed extensive continental shelves and reduced sea crossings, though Ireland's exact connections to Britain and the continent changed with ice, sea level and local topography. Animal movement was possible in some phases; the routes, seasons and population sizes remain uncertain.

The Human Question

There is no securely excavated settlement, hearth, house, tool-making floor, burial, artwork or named individual from Ireland that can be dated to this point. Accordingly, there can be no responsible account of Irish government, diplomacy, organised warfare, religion, literacy, formal learning, farming or trade in 31,903 BCE. There were no states, kingdoms, churches, ports or markets in the later historical sense. If people reached Ireland in MIS 3, they would have been small, mobile Upper Palaeolithic foraging groups whose social relations, belief and seasonal movements are archaeologically invisible here.

A possible exception gives this date its special interest, but it must remain explicitly provisional. A reindeer femur from the Castlepook collection has been reported as bearing marks consistent with cutting by a sharp stone tool and as dating to about 33,000 years ago. If the marks are confirmed as anthropogenic and securely associated with the bone's age, the find would indicate a brief human encounter with a reindeer carcass far earlier than Ireland's formerly accepted archaeological record. It would demonstrate neither a permanent colony nor a village: at most, a fleeting episode of carcass processing. Recent accounts of Irish Palaeolithic archaeology rightly describe the claim as requiring further in-situ evidence and refined dating.

That caution is reinforced by an important contrast. The better-known evidence for Late Upper Palaeolithic human activity in Ireland comes from Alice and Gwendoline Cave in County Clare, where a cut-marked brown-bear bone has calibrated dates of c. 12,810–12,590 cal BP. New work has improved understanding of that cave's complicated deposits but does not push its evidence back into MIS 3. It confirms that direct dating, sediment study and taphonomic analysis are essential before a marked bone becomes a human history.

No Society to Describe—Yet

For this nominal year, the most accurate treatment of society and economy is therefore negative but meaningful. No settled population can be demonstrated; no cultivation, domestic animals, pottery, metalworking, monument building or exchange network has been identified. There is no evidence from which to infer Irish languages, ethnic identities or connections with later peoples. The first firm evidence of sustained human settlement belongs vastly later, after ice-sheet retreat and major environmental transformation. Even the earliest currently accepted Upper Palaeolithic evidence is separated from this MIS 3 horizon by more than twenty millennia.

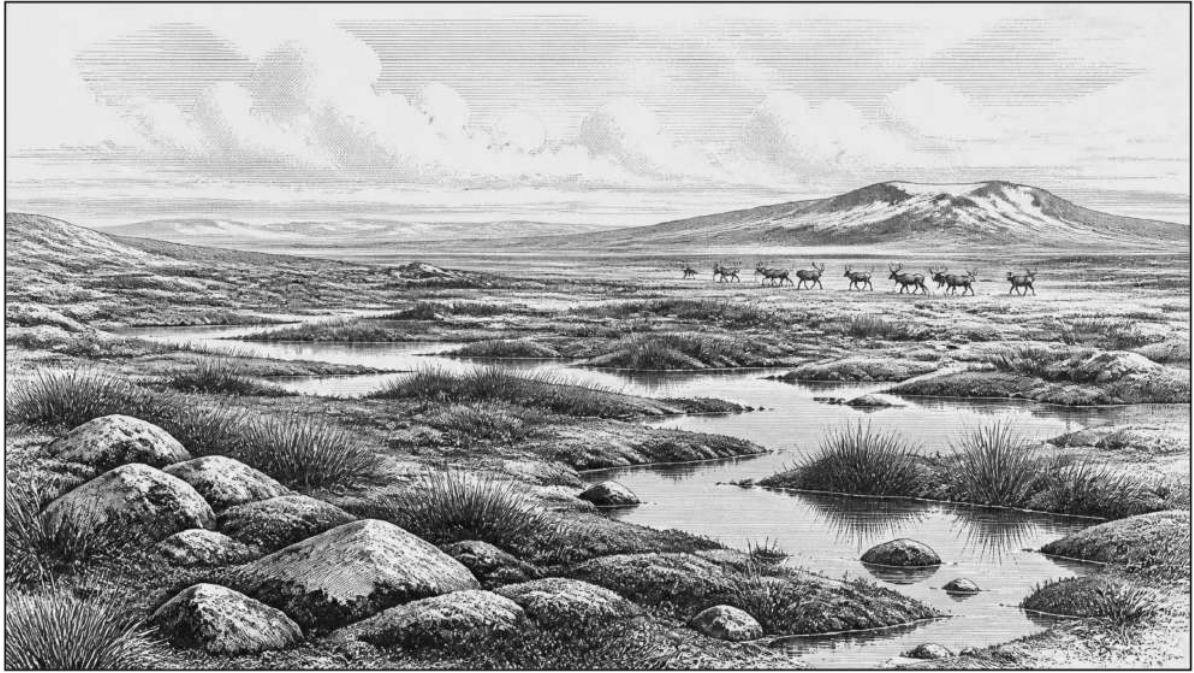
What can be said is that Ireland was part of an ecological frontier. Its caves preserve rare traces of animals that crossed, occupied or repeatedly returned to changing landscapes at Europe's north-western margin. Predators and prey, open habitats and advancing ice, exposed shelves and shifting sea barriers shaped the possibilities for any human visitor. The important development around 31,903 BCE was not a recorded Irish event but the creation—and frequent destruction—of the environmental conditions under which life might persist on the island.

Hyaena Hall's bone deposits convey that story more eloquently than any invented chronicle could. They reveal a Pleistocene Ireland intermittently inhabited by large mammals, but they also reveal the limits of the record. At this date, Ireland's history is not yet one of rulers or peoples known by name. It is a history of climate pulses, animal movement, cave taphonomy and scientific revision: a country whose deepest past survives in fragments, demanding imagination tempered by restraint.

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31902 BCE

Bogbean Beneath the Tills^[99]



“31,902 BCE” gives an impression of precision that the evidence cannot sustain. No event in Ireland can be assigned to that modern calendar year, and there is no written record, named person, settlement or securely dated human occupation from it. In archaeological terms, the point lies about 33,850 calendar years before 1950, within Marine Isotope Stage 3 (MIS 3), a fluctuating phase of the last glacial cycle. The responsible way to approach it is therefore through broad calibrated ranges, cave deposits, animal remains, pollen, plant macrofossils and the changing behaviour of the British-Irish Ice Sheet. These sources illuminate an Ice Age landscape rather than a year in the later historical sense.

Dating an Uncertain Moment

Radiocarbon laboratories report ages in years before present, where “present” conventionally means 1950, not the present day. Those measurements must then be calibrated against independently dated records of past atmospheric carbon, using curves such as IntCal20. At great antiquity, a radiocarbon measurement can correspond to a wide calendar range rather than a single year. “31,902 BCE” is thus best read as a notional place within the later Middle Midlandian, the Irish term commonly used for this part of the Last Glacial Period, rather than as an anniversary that archaeology can observe.

The chronology has become more complicated, and more interesting, as old bone collections have been retested. At Castlepook Cave, near Doneraile in north County Cork, early twentieth-century excavations recovered a large mixed collection of animal remains. Improved pretreatment and accelerator mass spectrometry have shown that several earlier radiocarbon determinations were too young, in some cases by thousands of radiocarbon years. A 2020 reassessment placed elements of the Castlepook fauna

firmly in MIS 3 and suggested that species including giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum. That revision is a warning against treating old cave dates, or a numbered BCE year, as immovable fact.

An Ireland of Ice Margins

Ireland was not yet at the maximum extent of the last British-Irish Ice Sheet. Current reconstructions place that maximum much later, broadly around 25,000–23,000 years ago. Around 31,902 BCE, however, climate was already cold, unstable and capable of changing sharply over periods far longer than any human lifetime. Ice expanded and contracted across the region over successive phases; mountain and lowland ice, periglacial ground and cold-season snowfields reshaped the possibilities for plants, animals and any people who might have entered the island.

It would be misleading to picture the whole island as a single unbroken white sheet at every moment. Evidence from sites such as Derryvree near Maguiresbridge, County Fermanagh, preserves an organic freshwater deposit between glacial tills. Its radiocarbon age, formerly reported as about 30,500 radiocarbon years BP, and its fossil content demonstrate that ice-free or partly ice-free ground existed in at least some Irish regions during parts of the Middle Midlandian. The deposit's plant remains, pollen and insects point to an open, treeless tundra or muskeg environment: grasses, sedges, herbs, mosses, dwarf shrubs and arctic-alpine plants, with shallow water and saturated ground in sheltered places.

That local record should not be mechanically projected across all of Ireland or onto one exact date. Sediments accumulate in particular hollows; pollen may travel; plant fossils indicate a nearby habitat rather than an entire province. Yet Derryvree gives a rare, tangible picture of the kinds of ecological refuges and exposed landscapes that could punctuate a generally severe climate. There was no forest comparable with modern Irish woodland. Wind, frost, seasonal thaw, bare mineral ground and sparse vegetation would have been central features of many landscapes. Rivers carried sediment from unstable slopes, while caves and fissures trapped bones, droppings and debris that later became the principal archive.

The Cave Fauna

Castlepook is especially important because its faunal assemblage contains animals associated with cold-stage north-west Europe. Reindeer, woolly mammoth, giant deer, brown bear, wolf, fox, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena have all been identified among material attributed to its Pleistocene deposits. Not every specimen belongs to the same moment, and the original excavations did not meet modern standards of recording. Even so, the recurring combination establishes that southern Ireland could support, or at least receive, a diverse cold-adapted fauna during MIS 3.

These animals were not merely a picturesque “mammoth-steppe” list. Reindeer were mobile grazers and browsers suited to open country; lemmings indicate harsh conditions and low vegetation; carnivores show that food chains extended beyond herbivores alone. Hyaena remains and gnawed bones matter particularly because caves may have been dens, scavenging places or natural traps, not necessarily places where humans lived. Mammoth bone likewise proves that mammoths occurred in Ireland, but does not show how numerous they were, whether they formed permanent herds, or whether a particular cave bone was brought in by people, carnivores, water or collapse.

Sea level was substantially lower than today because large quantities of water were locked in continental ice. Ireland's coastlines therefore lay farther out in places, and the Irish Sea and Celtic Sea basins formed a different geographical setting. Lower sea level did not automatically create an easy, continuous land route from the European mainland: glaciers, channels, cold waters and changing terrain all mattered. The fossil record nevertheless demonstrates that animals had reached Ireland. Their presence is evidence for real connectivity at particular times, not a map of one permanent route.

The Castlepook Human Question

The most provocative evidence close to this era is a reindeer femur fragment from Castlepook reported in 2021 as dating to roughly 33,000 years ago and bearing marks interpreted as stone-tool butchery. If that interpretation is eventually confirmed through full specialist publication and comparison with natural damage, it would indicate that people processed a reindeer in Ireland during the Upper Palaeolithic, far earlier than the formerly accepted record of human presence. It would be a major discovery.

For now, its implications must remain narrow. The bone comes from a complex cave collection created by antiquarian excavation, not from a modernly excavated camp floor containing a tool assemblage, hearth, dwelling and human remains. A date on the bone establishes when the animal died within a statistical range; it does not prove where it was killed, who made every mark, how long people stayed, or whether they returned. Carnivore tooth marks, trampling, sediment movement, excavation damage and later handling can all complicate bone-surface interpretation. The National Museum of Ireland still describes Palaeolithic human presence on the island as lacking clear evidence in the conventional archaeological record.

Consequently, it is not responsible to describe a settled Irish population in 31,902 BCE. There is no basis for named clans, an enduring village, a language, clothing style, burial rite or family economy. The strongest cautious interpretation is that Ireland may have been visited episodically by very small Upper Palaeolithic groups moving through the wider north-west European world, perhaps following animal movements or exploiting a short-lived opportunity in an ice-free landscape. That is an inference from a possible butchered bone and regional comparisons, not a demonstrated history of permanent colonisation.

No Politics, No Proven Wars

Political affairs, diplomacy and organised conflict cannot be recovered for Ireland at this depth of time. There were no states, kingdoms, borders, treaties or institutions visible in the evidence, and it would be anachronistic to supply them. Nor is there direct Irish evidence for warfare, ritual practice, formal learning, art, long-distance trade or structured exchange at this date. Stone technologies, symbolic traditions and social networks are well documented elsewhere in Upper Palaeolithic Europe, but they cannot simply be transferred across the sea to Ireland without local finds.

The same restraint applies to everyday life. A potentially butchered reindeer bone could imply skilled cutting and knowledge of carcass processing, but it does not reveal meals, shelters, gender roles, kinship, leadership or seasonal routines. Caves may have offered temporary protection, yet the available cave evidence does not demonstrate that Castlepook was a human home. The island's archaeological silence here is partly historical: later glaciation eroded and buried landscapes, while acidic soils, mobile sediments and early collecting practices have reduced what survived and what can now be interpreted.

Regional Change Before the Maximum

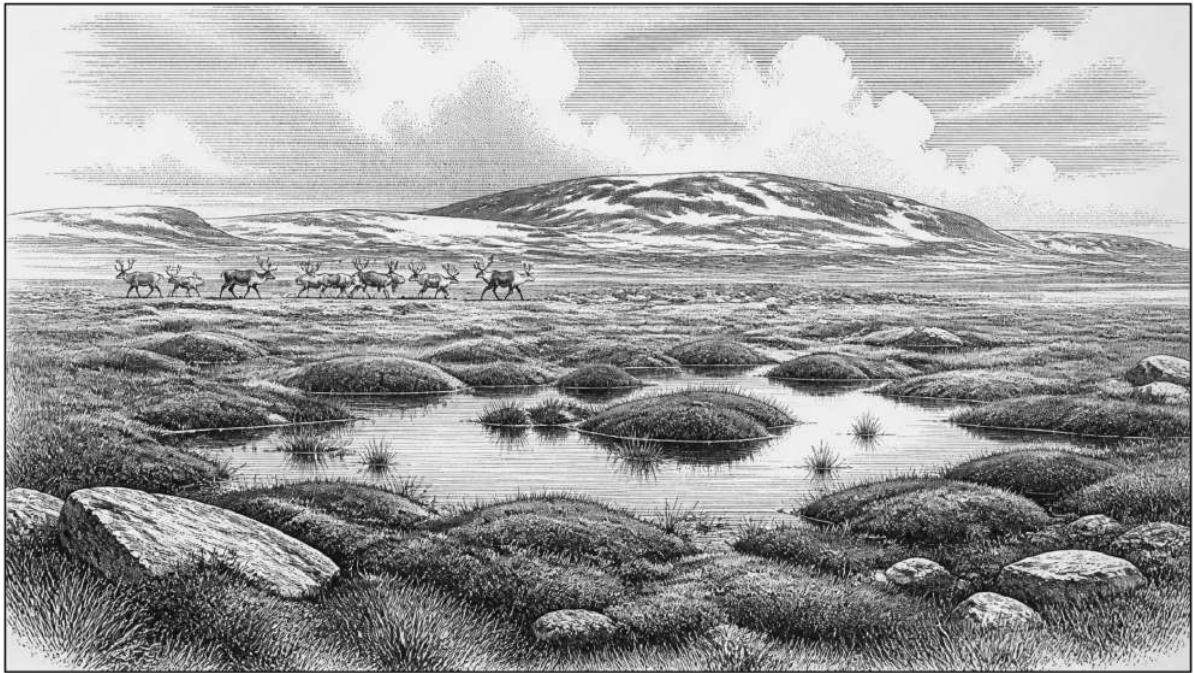
The important development around this notional year was environmental, not political. Ireland was moving through a severe and variable glacial world in which habitable ground, animal ranges and routes of movement could alter dramatically. Derryvree preserves evidence for open wet tundra in the north; Castlepook and other southern caves preserve a striking animal archive; offshore research shows that the major ice-sheet maximum still lay in the future. Together, they replace an older image of a uniformly lifeless island with a more uneven picture of cold refuges, fauna and profound uncertainty.

That uncertainty is itself the historical conclusion. Around 31,902 BCE, Ireland was certainly part of the ecological geography of Ice Age north-west Europe. Reindeer, mammoth and predators entered or lived within its landscapes during the broader period, while tundra vegetation persisted in favourable places. Whether people briefly reached the island at a closely comparable time remains an important but unresolved question. Future excavations of undisturbed cave sediments, direct dating and microscopic study of bones may make the answer clearer; they cannot justify inventing a calendar-year story before the evidence exists.

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31901 BCE

Castlepook and Derryvree^[100]



The label 31,901 BCE cannot identify a particular Irish event, season, leader or community. At this depth of time there are no written records, named populations or calendar-based chronologies. In archaeological terms, it is best treated as an approximate point around 33,850 calibrated years before present (cal BP, where “present” is 1950), within the Late Pleistocene and Marine Isotope Stage 3. Calibration curves, radiocarbon uncertainties and the disturbed character of many Irish deposits mean that modern year-by-year precision is unavailable. What can responsibly be described is the evidence for Ireland during a broad interval around this point: a cold landscape, not yet at the height of the Last Glacial Maximum, supporting a striking but thinly documented Ice Age fauna.

A Cold Interval Before Maximum Ice

Ireland was then part of the wider north-west European world of the last glacial cycle. It was not the uniformly ice-smothered island sometimes imagined from later phases of the Ice Age. The great British-Irish Ice Sheet would eventually expand dramatically, reaching its maximum extent on the Atlantic shelf roughly 26,000–24,000 cal BP and then retreating in stages. Around the equivalent of 31,901 BCE, however, evidence from beneath later glacial sediments indicates that at least some Irish regions had remained ice-free during earlier parts of the cycle. This does not mean that conditions were mild. It means that cold, seasonal and periglacial environments could exist beyond, between or before major ice advances.

The most useful evidence comes from deposits whose dates are ranges rather than annual observations. At Derryvree near Maguiresbridge, County Fermanagh, organic-rich freshwater sediments lie between an older till and a later glacial deposit. A conventional radiocarbon result of $30,500 \pm 1,200$

radiocarbon years BP has been calibrated to a broad range of approximately 36,900–31,700 cal BP. That range overlaps the chronological neighbourhood of 31,901 BCE, but it cannot prove that its plants and insects lived in that exact year. Greenagho, also in Fermanagh, has organic deposits beneath till with a reported age suggesting ice-free conditions before the later expansion of the Irish ice sheet, though the reliability and precise implications of legacy dates require caution.

Derryvree's pollen, plant and insect evidence points to open, treeless ground with sedges, grasses, herbs, juniper and freshwater mosses. The insects indicate cold northern conditions, while the sediments suggest pools, wet mossy ground and abundant plant detritus: a muskeg-like environment rather than an unbroken desert of snow. Such terrain would have changed markedly with season, exposure and drainage. Wind, frost action, shallow water, sparse vegetation and patches of sheltered growth probably made a varied habitat across lowlands, slopes and river basins. It was harsh country, but not lifeless country.

Castlepook's Ice-Age Fauna

For southern Ireland, Castlepook Cave near Doneraile in north County Cork is central. Excavations there in the late nineteenth and early twentieth centuries recovered a very large mixed collection of animal bones from cave deposits. The collection includes remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, spotted hyaena and lemmings, alongside other animals. It establishes beyond reasonable doubt that Ireland was, during parts of the pre-Last Glacial Maximum, within the range of cold-adapted and open-country mammals.

Older radiocarbon measurements on a mammoth bone and a spotted-hyaena bone from Castlepook produced dates of about $33,500 \pm 1,200$ and $34,300 \pm 1,800$ radiocarbon years BP respectively. Later work has reconsidered the dating of southern Irish Marine Isotope Stage 3 faunas using improved pretreatment and accelerator dating. The principal lesson is not that every Castlepook specimen belongs to one brief moment. Rather, the cave preserves material accumulated across a long and complicated span, and some previously accepted dates have been revised substantially. Castlepook is therefore excellent evidence for a Pleistocene animal world in Ireland, but poor evidence for reconstructing a single year.

The cave's contents also need taphonomic reading: bones do not arrive in caves only through human action. Spotted hyaenas are capable scavengers and bone accumulators, and many Castlepook bones bear damage consistent with carnivore activity. Animals may also have died naturally, been moved by water or slope processes, or been mixed when early excavators removed deposits. Mammoth and reindeer remains show that large herbivores entered or moved through the wider landscape; hyaena, wolf and Arctic fox show that predators and scavengers did too. Yet the relative abundance of bones in a cave cannot be converted simply into a census of animals outside it.

Recent sedimentary ancient-DNA research at Castlepook has added a new line of evidence, detecting a wider Late Pleistocene fauna in cave sediment and recovering mitochondrial information from Irish hyaena and mammoth. As a 2026 preprint, it remains developing research rather than a final peer-reviewed verdict. Even so, its findings are consistent with an important wider conclusion: Ireland's large mammals were not necessarily isolated curiosities. They formed part of broader Eurasian populations and dispersal networks before the Last Glacial Maximum. The physical route or routes of those movements remain a matter for palaeogeographical investigation, not a licence to assume a permanent, easily crossed land bridge.

People: A Possibility, Not a Population

The human story must be told more cautiously still. A reindeer bone from the Castlepook collection has been reported as bearing marks consistent with stone-tool butchery, and it has been discussed as possible evidence for human activity around 33,000 years ago. If that interpretation is sustained by continued analysis, it would greatly extend the antiquity of human presence in Ireland. It would indicate at least a visit, encounter or episode of carcass processing during the wider Middle Upper Palaeolithic period.

But this is not evidence for a settled Irish population in 31,901 BCE. No securely dated house, hearth, stone-tool assemblage, burial, occupation surface or repeated camp sequence has yet been demonstrated for this age in Ireland. The relevant bone was recovered from an old cave collection rather than modern controlled excavation, and the distinction between human cut marks, trampling, carnivore damage and other surface modification demands rigorous microscopic study. The evidence permits a possibility of people; it does not support claims about their language, kin groups, numbers, route of arrival or permanent residence.

Accordingly, there can be no responsible account of Irish political affairs, diplomacy, leaders or organised warfare for this date. Nor is there evidence for Irish religious institutions, formal learning, art traditions or traded goods. If human visitors did reach the island, they would have belonged to mobile Upper Palaeolithic hunter-gatherer worlds known elsewhere in north-west Europe, for whom knowledge of animals, weather, stone and seasonal movement was essential. That is an informed regional comparison, not direct evidence from Ireland. It must not be mistaken for a recovered Irish society.

Subsistence Without an Economy

The landscape nevertheless had resources. Reindeer could provide meat, marrow, hide, sinew, antler and bone; mammoth carcasses, whether hunted elsewhere, scavenged or naturally dead, represented unusually large concentrations of usable food and raw material. Smaller mammals and birds, freshwater pools and plants would have contributed to a complex food web. For carnivores, a cave such as Castlepook might serve as shelter, den or a place where bones accumulated. For any human party, it might have been a temporary refuge or a risky place shared with predators, rather than a home.

It would be misleading to call this a trading economy. There is no evidence for exchange between Irish communities because no such communities have been identified. Nor can animal movement be called trade. What can be said is that the occurrence of mammoth, hyaena and reindeer demonstrates ecological connectivity: suitable habitats and movement corridors existed at intervals across the north-western fringe of Europe. Lower global sea levels altered coastlines and exposed parts of the continental shelf, but sea level, ice loading and local land movement created changing and uncertain barriers. The exact geography experienced by each animal population remains under investigation.

What This Date Can Mean

The most historically important development around the notional date of 31,901 BCE was environmental rather than political. Ireland was a cold, dynamic part of Pleistocene Europe, with open vegetation, freshwater wetlands and an assemblage of large mammals now absent from the island. Some

areas had not yet been overridden by the expanding ice sheet that would later erase, bury and rearrange much of the evidence. The surviving record is patchy partly because subsequent glaciation, erosion, acidic soils and antiquarian excavation have all destroyed or confused deposits.

Castlepook Cave and Derryvree therefore stand not as monuments to a known year, but as archives of long intervals. Derryvree preserves environmental signals from a cold, ice-free phase in Fermanagh; Castlepook preserves fragments of an extraordinary southern fauna and a debated hint of human action. Together they show why Ireland's deep past cannot be narrated as a blank before settlement, yet also why restraint is essential. Around this point in the Late Pleistocene, there may have been brief human contact with Ireland's reindeer country. There is no evidence, however, for an Irish polity, village or continuous human history. The securely recoverable story is one of animals, climate, changing ice and the fragile survival of clues.



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 — Castlepook Cave Fauna (32000 BCE). Sources: References 3, 21, 24, 30, 87, 114–115, 131, 145, 166, 209, 236, 248, 257, 310, 319, 330, 406, 409, 427.
2. Chapter 002 — Cut-Marked Reindeer Bone (31999 BCE). Sources: References 3, 31, 38, 48, 61, 76, 116, 129, 145, 150, 166, 188, 195, 232, 236, 255, 270, 326, 350, 386, 390, 428.
3. Chapter 003 — Castlepook Reindeer Marks (31998 BCE). Sources: References 21, 32, 48, 60, 77, 117, 121, 132, 167, 210, 233, 236, 260, 304, 351, 365, 387, 406, 418, 429.
4. Chapter 004 — Ice Age Threshold (31997 BCE). Sources: References 3, 28, 41, 48, 69, 78, 117, 131, 145, 150–151, 201, 211, 236, 274, 311, 351, 387, 390, 410.
5. Chapter 005 — Castlepook's Cold-Stage Fauna (31996 BCE). Sources: References 2–3, 28, 30, 46, 77, 118, 123, 131, 146, 166, 195, 210, 232, 236, 257, 267, 274, 356, 388, 424, 434.
6. Chapter 006 — Cork Reindeer Butchery (31995 BCE). Sources: References 3, 20, 25, 31, 79, 123, 131, 145, 165, 186, 195, 212, 220, 236, 251, 265, 274, 306, 335, 386, 406, 415.
7. Chapter 007 — Castlepook Reindeer Femur (31994 BCE). Sources: References 3, 14, 30, 48, 117, 131, 145, 186, 196, 213, 236, 240, 301, 364–365, 385, 387, 406, 419, 427.
8. Chapter 008 — Ireland Before Settlement (31993 BCE). Sources: References 3, 10, 31, 48–49, 57, 76, 116, 131, 165–166, 193, 197, 201, 233, 236, 240, 252, 268, 315, 330, 356, 406, 424.
9. Chapter 009 — Castlepook Reindeer Butchery (31992 BCE). Sources: References 3, 18, 22, 32, 117, 132, 167–168, 170, 230, 236, 312, 331, 357, 369, 387, 397, 406, 429, 435.
10. Chapter 010 — Atlantic Ice Sheet Growth (31991 BCE). Sources: References 3, 21, 32, 77, 117, 132, 170, 201, 236, 268, 274, 278, 294, 315, 326, 376, 387, 391, 410, 429.
11. Chapter 011 — Castlepook's Pleistocene Fauna (31990 BCE). Sources: References 3, 14, 28, 30, 48, 59, 119, 132, 166, 169, 209, 236, 268, 271, 330, 340, 350, 360, 376, 389, 406, 427.
12. Chapter 012 — Derryvree's Tundra Archive (31989 BCE). Sources: References 54, 57, 75, 126, 131–132, 161, 164, 170, 174, 209, 221, 252, 257, 272, 278, 327, 341, 385, 388, 406, 424, 429.
13. Chapter 013 — Castlepook Reindeer Evidence (31988 BCE). Sources: References 3, 21, 27, 32, 117, 123, 132, 145, 165, 170, 189, 236, 255, 268, 271, 278, 352, 385, 387, 421.
14. Chapter 014 — Castlepook's Cut-Marked Femur (31987 BCE). Sources: References 31, 48, 115, 120, 131, 133, 142, 166, 170, 175, 226, 237, 257, 272, 304, 342, 350, 386, 390, 406, 424, 427.
15. Chapter 015 — Castlepook's Mammoth Fauna (31986 BCE). Sources: References 10, 30, 61, 97, 116, 120, 134–135, 186, 209, 233, 236, 240, 251, 257, 268, 298, 330, 341, 350, 389, 406, 412, 427, 430.
16. Chapter 016 — Butchery Marks at Castlepook (31985 BCE). Sources: References 3, 31, 48, 69–70, 80, 93, 116, 123, 132, 145, 166, 177, 195, 237, 282, 330, 389, 406, 409, 417, 427.
17. Chapter 017 — Castlepook Reindeer Cut Mark (31984 BCE). Sources: References 3, 17, 24, 32, 61, 69, 76, 120, 132, 145, 166, 193, 236, 292, 307, 347–348, 357, 376, 389, 391, 406, 409, 429.
18. Chapter 018 — Ice-Age Threshold (31983 BCE). Sources: References 1, 21, 24, 31, 48, 76, 116, 145, 166, 171, 188, 222, 236–237, 241, 245, 268, 278, 346, 388, 424, 427.
19. Chapter 019 — Castlepook Hyena Den (31982 BCE). Sources: References 3, 24, 31, 48, 61, 120, 131, 169, 195, 209, 236, 240, 257, 271, 330, 350, 389, 406, 422, 428.
20. Chapter 020 — Reindeer Butchery at Castlepook (31981 BCE). Sources: References 3, 14, 21, 48, 77, 101, 120, 145, 165, 167, 170, 234, 236, 242, 282, 315, 353, 357, 387, 406.

- 21.** Chapter 021 — Shandon Cave Fauna (31980 BCE). Sources: References 5, 28, 32, 77, 88, 111, 117, 132, 188, 195, 209, 236, 240, 246, 260, 289, 303, 308, 310, 357, 368, 376, 387, 424.
- 22.** Chapter 022 — Reindeer Processing at Castlepook (31979 BCE). Sources: References 3, 14, 22, 28, 61, 87, 120, 131, 145, 175, 194–195, 209, 236, 248, 257, 278, 330, 389–390, 411.
- 23.** Chapter 023 — Doneraile Reindeer Bone (31978 BCE). Sources: References 3, 14, 21–22, 28, 32–33, 73, 76, 107, 116, 129, 145, 209, 236, 307, 341, 350, 406, 427.
- 24.** Chapter 024 — Derryvree Beneath the Till (31977 BCE). Sources: References 7, 47, 76, 102, 113, 120, 153–155, 197, 209, 236, 245, 248, 255, 278, 296–297, 309, 332, 341, 377, 400, 406, 413, 427, 430.
- 25.** Chapter 025 — Derryvree Ice-Free Interval (31976 BCE). Sources: References 32, 61, 77, 117, 123, 170, 190, 196, 236, 247, 252, 272, 278, 290, 327, 330, 350, 387, 394, 406, 424, 429.
- 26.** Chapter 026 — Ice Before History (31975 BCE). Sources: References 2–3, 24, 30, 76, 107, 120, 134, 136, 145, 156, 203, 238, 285, 292, 307, 342, 356, 376, 384, 388, 392, 420, 433.
- 27.** Chapter 027 — Castlepook Reindeer Incision (31974 BCE). Sources: References 3, 28, 32, 69, 117, 122–123, 132, 145, 166, 196, 209, 236, 278, 350, 357, 389–390, 405, 425, 429, 435.
- 28.** Chapter 028 — Castlepook's Marked Reindeer Femur (31973 BCE). Sources: References 3, 28, 32, 44, 49, 82, 117, 132, 145, 176, 196, 214, 236, 240, 272, 289, 310, 331, 376, 387, 418, 435.
- 29.** Chapter 029 — Marine Isotope Stage Three (31972 BCE). Sources: References 3, 31, 76, 86, 123, 137, 148, 151–152, 158, 170, 188, 209, 231, 236, 274, 281, 299, 330, 343, 350, 377, 389.
- 30.** Chapter 030 — Ice-Age Ireland (31971 BCE). Sources: References 2–3, 21, 30, 48, 77, 90, 98, 120, 145, 177, 187, 190, 198, 236, 240, 275, 303, 354, 387, 406, 427.
- 31.** Chapter 031 — Castlepook Cave Deposits (31970 BCE). Sources: References 21, 30, 48, 61, 115, 117, 132, 138, 166, 236, 240, 245, 265, 274, 350, 357, 389, 406, 419, 427.
- 32.** Chapter 032 — Castlepook's Glacial Fauna (31969 BCE). Sources: References 48, 65, 69, 77, 117, 131, 159, 167, 190, 196, 236, 243, 257, 285, 330, 376, 387, 406, 410, 418, 429.
- 33.** Chapter 033 — Fermanagh Subglacial Organics (31968 BCE). Sources: References 3, 7, 30, 48, 76, 153, 186, 196, 233, 236, 303, 332, 365, 389, 401–402, 406, 424, 426–427.
- 34.** Chapter 034 — Castlepook Faunal Assemblage (31967 BCE). Sources: References 3, 8, 24, 28, 32, 48, 81, 86, 132, 145, 170, 190, 205, 236, 246, 278, 376, 387, 406, 429.
- 35.** Chapter 035 — Before the Ice Maximum (31966 BCE). Sources: References 3, 28, 31, 69, 87, 116, 131, 145, 166, 188, 221, 237, 278, 307, 330, 356, 389, 409, 426–427.
- 36.** Chapter 036 — Crag Cave Calcite Growth (31965 BCE). Sources: References 3, 14, 28, 31, 61, 93, 120, 131, 145, 188, 197, 223, 236, 272, 285, 298, 321, 330, 389, 406, 424, 427.
- 37.** Chapter 037 — Castlepook Reindeer Toolmarks (31964 BCE). Sources: References 3, 32, 36, 61, 77, 88, 145, 196, 209, 236, 246, 264, 274, 316, 330, 357, 376, 387, 394, 429.
- 38.** Chapter 038 — Derryvree Interstadial Deposits (31963 BCE). Sources: References 21–22, 32, 61, 84, 94, 120, 132, 150, 170, 236, 257, 273, 310, 322, 350, 362, 376, 389, 393, 406, 430.
- 39.** Chapter 039 — Herb-Rich Tundra (31962 BCE). Sources: References 31, 48, 51, 79, 116, 131, 145, 179, 199, 237, 240, 268, 272, 306, 314, 327, 334, 389, 398, 406, 409, 417.
- 40.** Chapter 040 — Castlepook's Marked Bone (31961 BCE). Sources: References 3, 24, 28, 32, 77, 99, 111, 120, 132, 143, 151, 165, 183, 236, 254, 288, 293, 387, 409, 418.
- 41.** Chapter 041 — Exposed Celtic Sea Shelf (31960 BCE). Sources: References 3–4, 24, 32, 48, 55, 117, 132, 145, 190, 196, 236, 250, 260, 331, 366–367, 376, 387, 421.

- 42.** Chapter 042 — Mammoth Cave Fauna (31959 BCE). Sources: References 3, 28, 32, 41, 49, 77, 117, 145, 236, 272, 310, 351, 365, 376, 387, 391, 406, 418, 421, 429.
- 43.** Chapter 043 — Cork Animal Processing (31958 BCE). Sources: References 3, 28, 31, 49, 76, 89, 145, 166, 195, 202, 209, 236, 261, 265, 291–292, 341, 389, 406, 408.
- 44.** Chapter 044 — Carden’s Reindeer Cut Mark (31957 BCE). Sources: References 3, 28, 31, 70, 76, 115, 123, 138, 145, 166, 209, 236, 247, 278, 330, 350, 376, 388, 406, 428.
- 45.** Chapter 045 — Castlepook’s Reindeer Bone (31956 BCE). Sources: References 3, 28, 32, 48, 115, 117, 132, 194, 214, 236, 252, 268, 272, 281, 318, 365–366, 385, 387, 429.
- 46.** Chapter 046 — British-Irish Ice Sheet Expansion (31955 BCE). Sources: References 3, 28, 31, 34, 76, 120, 134, 145, 166, 209, 236, 271, 315, 320, 323, 366, 376, 388, 406, 426.
- 47.** Chapter 047 — Ruth Carden’s Reassessment (31954 BCE). Sources: References 3, 14, 24, 28, 30, 76, 120, 134, 145, 166, 188, 195, 236, 257, 272, 275, 327, 330, 388, 390.
- 48.** Chapter 048 — Carden’s Reindeer Femur (31953 BCE). Sources: References 31, 69, 76, 105, 132, 145, 166, 173, 191, 195, 223, 236, 245, 272, 290, 341, 376, 389, 424, 427.
- 49.** Chapter 049 — Southern Irish Raised Beaches (31952 BCE). Sources: References 9, 12, 49, 55, 95, 111, 117, 132, 143, 196, 215, 236, 241, 255, 268, 319, 326, 361, 387, 391, 418, 425.
- 50.** Chapter 050 — Southern Ice-Free Ground (31951 BCE). Sources: References 21, 28, 31, 48, 145, 169, 171, 193, 195, 236, 252, 278, 330, 341, 344, 350, 389, 405–406, 427.
- 51.** Chapter 051 — Before Maximum Ice (31950 BCE). Sources: References 74, 76, 120, 166, 187–188, 195, 201, 222, 236, 252, 257, 272, 287, 291, 330, 388, 391, 406, 409, 424, 427.
- 52.** Chapter 052 — Crag Cave Interstadial (31949 BCE). Sources: References 3, 21, 24, 30, 48, 115, 120, 129, 131, 236, 250, 286, 332, 337–338, 365–366, 376, 389, 406.
- 53.** Chapter 053 — Before the Ice Peak (31948 BCE). Sources: References 3, 49–50, 108, 116, 131, 148, 172, 186, 195, 209, 231, 236, 257, 263, 307, 330, 350, 378, 389, 406, 417.
- 54.** Chapter 054 — Ice and Uncertainty (31947 BCE). Sources: References 3, 28, 31, 40, 48, 70, 76, 115, 134, 138, 236, 274, 285, 291–292, 327, 332, 389, 406, 427.
- 55.** Chapter 055 — Greenagho Ice-Free Deposits (31946 BCE). Sources: References 32, 58, 71, 77, 139, 145, 160, 169, 216, 236, 260, 262, 336, 338–340, 363, 376, 391, 406, 410, 416, 418, 424, 429.
- 56.** Chapter 056 — Glacial Erosion Legacy (31945 BCE). Sources: References 3, 21, 28, 32, 48, 115, 117, 132, 140, 166, 211, 236, 257, 268, 294, 331, 372, 376, 387, 391, 406, 418.
- 57.** Chapter 057 — Mammoth Cave Assemblage (31944 BCE). Sources: References 3, 24, 28, 30, 48, 117, 132, 171, 236, 240, 257, 280, 283, 302, 357, 385, 389, 391, 406, 427.
- 58.** Chapter 058 — IntCal Calibration Curve (31943 BCE). Sources: References 3, 19, 30, 48, 76, 103, 157, 159, 166, 188, 222, 231, 236, 265, 273, 292, 296, 328–330, 341, 424, 427, 433.
- 59.** Chapter 059 — Castlepook Cave Mammals (31942 BCE). Sources: References 3, 32, 117, 132, 145, 173, 209, 233, 236, 240, 248, 251, 257, 264, 285, 366, 373, 376, 389, 406.
- 60.** Chapter 060 — Spotted Hyaena at Castlepook (31941 BCE). Sources: References 2–3, 24, 26, 30, 69, 116, 128, 134, 145, 186, 209, 226, 232, 236, 257, 350, 385, 388, 390, 424, 427.
- 61.** Chapter 061 — Courtmacsherry Coastal Deposits (31940 BCE). Sources: References 3, 28, 30, 57, 76, 86, 120, 131, 170, 195, 206, 209, 221, 272, 278, 327, 330, 372, 399, 424, 427, 436.
- 62.** Chapter 062 — Uneven Ice-Sheet Advance (31939 BCE). Sources: References 3, 24, 31, 77, 145, 150, 160, 168, 170, 200, 208, 226, 246, 272, 278, 327, 358, 377, 389, 397, 406, 430.

- 63.** Chapter 063 — Ulster Pollen And Beetles (31938 BCE). Sources: References 3, 11, 14, 24, 32, 48, 80, 115, 131, 145, 236, 313, 315, 319, 379, 385, 389–390, 406, 409, 422, 429.
- 64.** Chapter 064 — Periglacial Shrub Tundra (31937 BCE). Sources: References 3, 15, 21, 26, 48, 61, 80, 106, 120, 144, 188, 197, 202, 209, 237, 276, 341, 389, 406, 408, 426.
- 65.** Chapter 065 — Castlepook's Putative Toolmark (31936 BCE). Sources: References 21, 23, 31, 56, 76, 86, 120, 124, 137, 170, 188, 223, 236, 240, 257, 268, 330, 350, 376, 389, 406, 432.
- 66.** Chapter 066 — Approaching Last Glacial Maximum (31935 BCE). Sources: References 3, 24, 29, 39, 48, 61–62, 116, 120, 124, 132, 148, 152, 160, 178, 236, 357, 377, 389, 391, 395, 406, 414, 435.
- 67.** Chapter 067 — Ruth Carden's Cut Mark (31934 BCE). Sources: References 3, 21, 24, 32, 109, 115, 117, 122, 131–132, 145, 156, 236, 248, 272, 291, 376, 385, 387, 406, 423, 429.
- 68.** Chapter 068 — Ireland at the Ice Margin (31933 BCE). Sources: References 3, 24, 30, 48, 68, 72, 104, 150, 170, 192, 209, 223, 233, 273, 278, 330, 341, 406, 424, 427.
- 69.** Chapter 069 — Cave Sediment Chronologies (31932 BCE). Sources: References 3, 14, 32, 132, 143, 150, 159, 167, 217, 236, 256, 269, 274, 300, 310, 324, 351, 376, 387, 390.
- 70.** Chapter 070 — Early Animal Butchery (31931 BCE). Sources: References 3, 14, 28, 37, 48, 110, 131, 135, 145, 150, 160, 166, 209, 236, 238, 245, 252, 257, 330, 380, 388, 406, 424, 427.
- 71.** Chapter 071 — Castlepook's Ambiguous Toolmark (31930 BCE). Sources: References 3, 24, 32, 77, 117, 124, 132, 145, 170, 190, 211, 236, 239, 242, 248, 272, 289, 310, 351, 376, 389, 429.
- 72.** Chapter 072 — Derryvree Organic Silts (31929 BCE). Sources: References 31, 76, 80, 103, 115, 131, 135, 154, 160, 182, 188, 195, 209, 231, 236, 253, 291–292, 296, 385, 389, 406, 427, 433.
- 73.** Chapter 073 — Midlandian Glacial Stage (31928 BCE). Sources: References 3, 24, 28, 31, 70, 77, 132, 145, 165–166, 218, 236, 281, 331, 351, 385, 387, 406, 422, 427.
- 74.** Chapter 074 — Derryvree Freshwater Sequence (31927 BCE). Sources: References 21, 32, 45, 48, 77, 86, 116, 190, 196, 227, 236, 285, 293, 308, 310, 333, 351, 357, 391, 406, 425, 429.
- 75.** Chapter 075 — Cave Bone Taphonomy (31926 BCE). Sources: References 3, 31, 64, 76, 108, 141, 153, 188, 197, 209, 236, 290, 335, 372, 389–390, 406, 415, 424, 427.
- 76.** Chapter 076 — Carden's Castlepook Interpretation (31925 BCE). Sources: References 3, 14, 31, 53, 76, 117, 136, 145, 181, 191, 209, 236, 257, 272, 341, 350, 365, 371, 389, 406, 426.
- 77.** Chapter 077 — The Castlepook Femur (31924 BCE). Sources: References 3, 24, 32, 48, 71, 76, 132, 145, 167, 195, 204, 211, 233, 236, 260, 271, 330, 387, 390, 410, 424, 429.
- 78.** Chapter 078 — Castlepook's Reindeer Horizon (31923 BCE). Sources: References 3, 24, 70, 76, 120, 145, 160, 188, 195, 237, 240, 268, 295, 304–305, 356, 388–390, 417, 424, 427.
- 79.** Chapter 079 — Castlepook's Hyena Galleries (31922 BCE). Sources: References 3, 24, 30, 49, 56, 120, 135, 143, 145, 150, 169, 238, 250, 257, 276, 350, 376, 388, 391, 409, 419, 427.
- 80.** Chapter 080 — Castlepook's Reindeer Country (31921 BCE). Sources: References 3, 16, 21, 24, 30, 43, 48, 69, 116, 131, 149, 163, 177, 209, 236, 285, 370, 389–390, 409, 427.
- 81.** Chapter 081 — Hyaena Land, Castlepook (31920 BCE). Sources: References 3, 24, 31, 48, 76, 113, 140, 142, 160, 165, 188, 190, 195, 236, 268, 275, 330, 377, 388, 417.
- 82.** Chapter 082 — The Cut-Marked Reindeer (31919 BCE). Sources: References 3, 24, 29, 49, 88, 117, 137, 143, 145, 150, 165–166, 177, 190, 197, 233, 236, 268, 291, 387, 409, 429.
- 83.** Chapter 083 — Reindeer at Doneraile (31918 BCE). Sources: References 3, 24, 32, 49, 69, 117, 132, 145, 167, 197, 209, 236, 257, 290, 304, 351, 376, 387, 391, 397, 406, 410, 425, 429.

- 84.** Chapter 084 — Castlepook Cave Assemblage (31917 BCE). Sources: References 6, 24, 32, 48, 61, 66, 77, 115, 117, 145, 160, 167, 195, 236, 268, 276, 355, 376, 387, 397, 403, 406, 429.
- 85.** Chapter 085 — The Doneraile Tundra (31916 BCE). Sources: References 3, 14, 24, 28, 31, 48, 76, 131, 145, 165, 188, 193, 197, 203, 236, 276, 330, 344, 379, 381, 388, 427.
- 86.** Chapter 086 — Castlepook's Marked Reindeer Femur Revisited (31915 BCE). Sources: References 3, 24, 28, 32, 48, 77, 100–101, 120, 132, 224, 236, 255, 257, 317, 326, 353, 376, 387, 407, 410, 418, 421.
- 87.** Chapter 087 — Doneraile's Mammoth Cave (31914 BCE). Sources: References 3, 28, 30, 48–49, 87, 129, 177, 209, 236, 240, 257, 265, 268, 285, 290, 330, 365, 389, 417.
- 88.** Chapter 088 — Doneraile's Reindeer Cutmark (31913 BCE). Sources: References 3, 24, 28, 31, 112, 115, 124, 131, 145, 170, 188, 237, 240, 265, 274, 276, 356, 377, 385, 389, 424, 427.
- 89.** Chapter 089 — Elephant Hall Bone Sands (31912 BCE). Sources: References 3, 24, 28, 32, 48, 52, 117, 132, 147, 177, 211, 236, 240–241, 249, 260, 325, 335, 345, 350, 374, 376, 388.
- 90.** Chapter 090 — Castlepook's Mammoth Assemblage (31911 BCE). Sources: References 3, 31, 42, 48, 76, 116, 130, 134, 159, 166, 185, 209, 237, 240, 268, 276, 290, 310, 341, 350, 377, 389–391.
- 91.** Chapter 091 — Castlepook's MIS 3 Fauna (31910 BCE). Sources: References 3, 14, 24, 30, 48, 115, 150, 156, 170, 177, 195, 274, 285, 342, 375, 382, 389–390, 404, 409, 419, 427.
- 92.** Chapter 092 — Greenagho's Mosses (31909 BCE). Sources: References 3, 7, 24, 48, 91, 132, 167, 183, 233, 236, 240, 244, 252, 257, 271, 305, 330, 387, 409, 429.
- 93.** Chapter 093 — Derryvree's Tundra Pools (31908 BCE). Sources: References 3, 5, 24, 35, 49, 85, 132, 219, 227, 235–236, 252, 260, 264, 267, 276, 376, 385, 388, 396, 429.
- 94.** Chapter 094 — The Castlepook Question (31907 BCE). Sources: References 24, 48, 67, 76, 127, 131, 165, 184, 207, 228, 233, 237–238, 240, 252, 257, 268, 276, 291, 376, 379, 388–389, 404.
- 95.** Chapter 095 — Muskeg Beneath Fermanagh (31906 BCE). Sources: References 3, 31, 115, 125, 131, 143, 145, 148, 150, 165, 180, 228, 236, 252, 257, 277, 350, 383, 389, 427.
- 96.** Chapter 096 — Elephant Hall's Mammoth Bone (31905 BCE). Sources: References 3, 28, 31, 96, 145, 177, 209, 227, 229, 232, 236, 258, 265, 268, 276, 330, 376, 379, 385, 389.
- 97.** Chapter 097 — Derryvree's Periglacial Waters (31904 BCE). Sources: References 3, 13–14, 24, 32, 63, 92, 137, 183, 187, 196, 229, 236, 257, 271, 279, 389–390, 406, 409, 418, 429.
- 98.** Chapter 098 — Hyaena Hall's Open Country (31903 BCE). Sources: References 3, 14, 24, 32, 48, 115, 120, 132, 137, 177, 236, 240, 266, 268, 284, 341, 349, 376, 387, 406.
- 99.** Chapter 099 — Bogbean Beneath the Tills (31902 BCE). Sources: References 32, 83, 117, 160, 176–177, 209, 225, 236, 250, 252, 259, 264, 272, 276, 327, 331, 340, 365, 376, 387, 431.
- 100.** Chapter 100 — Castlepook and Derryvree (31901 BCE). Sources: References 13, 30, 69, 87, 92, 116, 132, 162, 169, 180, 237, 265, 268, 276, 315, 359, 389–390, 409, 427.

References

1. **1974:0011 - Mount Sandel, Derry**
<https://excavations.ie/report/1974/Derry/0000187/>
2. **2019:148 - Alice & Gwendoline Cave, Clare**
<https://excavations.ie/report/2019/Clare/0027706/>
3. **32564 - Castlepook Cave, Co. Cork**
<https://excavations.ie/report/2022/Cork/0032564/>
4. **A 10Be-Dated Record of Glacial Retreat in Connemara, Ireland, Following the Last Glacial Maximum and Implications for Regional Climate**
<https://doi.org/10.1016/j.palaeo.2022.110901>
5. **A 60,000 Year Greenland Stratigraphic Ice Core Chronology**
<https://doi.org/10.5194/cp-4-47-2008>
6. **A Critical Review and Re-Investigation of the Pleistocene Deposits Between Cranfield Point and Kilkeel, Northern Ireland**
<https://nora.nerc.ac.uk/id/eprint/521184/>
7. **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>
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://doi.org/10.1016/j.margeo.2019.03.003>
9. **Advances in Irish Quaternary Studies**
<https://doi.org/10.2991/978-94-6239-219-9>
10. **Advice to the Public**
<https://www.archaeology.ie/sites/default/files/media/publications/NMS%20Caves%20Leaflet%20lo-res.pdf>
11. **Aghnadarragh ASSI**
<https://www.daera-ni.gov.uk/protected-areas/aghnadarragh-assi>
12. **A Hyæna-Den in Ireland: The Exploration of Castlepook Cave, County Cork**
https://upload.wikimedia.org/wikipedia/commons/a/a2/Geological_magazine_%28IA_geologicalmagazi651918wood%29.pdf
13. **A Middle Midlandian Fresh-Water 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
14. **Ancient DNA, radiocarbon dating and osteological analyses of red deer from Ireland: implications for population history and human colonisation**
<https://www.npws.ie/sites/default/files/general/Quaternary%20Science%20Reviews%2042%20%282012%29%2074-84%20Carden%20et%20al.pdf>
15. **Ancient Hybridization and an Irish Origin for the Modern Polar Bear Matriline**
<https://pmc.ncbi.nlm.nih.gov/articles/PMC4677796/>
16. **Ancient hybridization and an Irish origin for the modern polar bear matriline**
<https://pubmed.ncbi.nlm.nih.gov/21737280/>
17. **Ancient Hybridization of Brown and Polar Bears**
<https://pgl.soe.ucsc.edu/edwards11.pdf>
18. **A New Bayesian Chronology for Mesolithic Occupation at Mount Sandel, Northern Ireland**
<https://doi.org/10.1017/S0079497X00000311>
19. **A New Bayesian Chronology for Mesolithic Occupation at Mount Sandel, Northern Ireland**
<https://www.cambridge.org/core/journals/proceedings-of-the-prehistoric-society/article/abs/new-bayesian-chronology-for-mesolithic-occupation-at-mount-sandel-northern-ireland/51EC4111C92E2D5FD128928277103028>
20. **A North-Western Habitat: the Paleoethology and Colonisation of a European Peninsula**
<https://intarch.ac.uk/journal/issue61/1/6.html>

21. Anthropogenic changes to the Holocene nitrogen cycle in Ireland

<https://pmc.ncbi.nlm.nih.gov/articles/PMC6007156/>

22. Archaeological Excavations at Killuragh Cave, Co. Limerick: A Persistent Place in the Landscape from the Early Mesolithic to the Late Bronze Age

<https://researchrepository.ucd.ie/rest/bitstreams/47195/retrieve>

23. Archaeological excavations at Killuragh Cave, Co. Limerick: a persistent place in the landscape from the Early Mesolithic to the Late Bronze Age

<https://researchrepository.ucd.ie/server/api/core/bitstreams/0fa70d1c-1476-4f2f-b49a-7a47c83c23bc/content>

24. Archaeological Heritage of County Cork

<https://www.corkcoco.ie/sites/default/files/2023-06/archaeological-heritage-of-county-cork-2020.pdf>

25. Archaeological Impact Assessment: Gortnahomna More, Castlemartyr, County Cork

<https://gortnahomnamorelrd.ie/library/docs/other/Archaeological%20Impact%20Assessment.pdf>

26. Archaeology & Landscape

<https://discoveryprogramme.ie/what-we-do/research/archaeology-landscape/>

27. Archaeology: The Burren and Cliffs of Moher UNESCO Global Geopark

<https://www.burrengeopark.ie/learn-engage/geology-of-the-burren/archaeology/>

28. Archaeology Research Excavation Grant 2022: Final Report

https://www.ria.ie/assets/uploads/2024/05/areg_2022_jennings_final_report_web_ready.pdf

29. Archaeology Research Excavation Grant Report: Castlepook Cave Geophysical Survey

<https://www.ria.ie/assets/uploads/2024/10/AREG-2023-Richard-Jennings.pdf>

30. 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>

31. 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>

32. A Reconsideration of the Radiocarbon Dating of the Marine Isotope Stage 3 Fauna from Southern Ireland

<https://doi.org/10.1111/bor.12451>

33. A Review of Research Needs in Irish Archaeology

https://www.heritagecouncil.ie/content/files/review_research_needs_irish_archaeology_2007_1mb.pdf

34. A Stratigraphic Framework for Abrupt Climatic Changes During the Last Glacial Period Based on Three Synchronized Greenland Ice-Core Records

https://pure.aber.ac.uk/ws/portalfiles/portal/5708372/A_stratigraphic_framework_for_abrupt_climatic_changes_during_the_Last_Glacial_period_based_on_three_synchronized_Greenland_ice_core_records_refining_and_extending_the_INTIMATE_event_stratigraphy.pdf

35. A Stratigraphic Framework for Abrupt Climatic Changes During the Last Glacial Period Based on Three Synchronized Greenland Ice-Core Records

<https://doi.org/10.1016/j.quascirev.2014.09.007>

36. 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/10.1002/jqs.1063>

37. A Stratigraphic Framework for Abrupt Climatic Changes During the Last Glacial Period Based on Three Synchronized Greenland Ice-Core Records: Refining and Extending the INTIMATE Event Stratigraphy

<https://phrepo.phbern.ch/7196/1/1-s2.0-S0277379114003485-main.pdf>

38. Atlas of the Irish Rural Landscape: Archaeological Heritage

<https://www.tcd.ie/media/tcd/geography/pdfs/Atlas2020.pdf>

39. Badhbh's Hole, Dungarvan Valley Caves Project, 2004

<https://excavations.ie/report/2004/Waterford/0012783/>

40. Bayesian modelling the retreat of the Irish Sea Ice Stream

<https://research.bangor.ac.uk/en/publications/bayesian-modelling-the-retreat-of-the-irish-sea-ice-stream/>

41. Behavioural Tendencies of the Last British–Irish Ice Sheet Revealed by Data–Model Comparison

<https://doi.org/10.1002/jqs.3628>

42. Behavioural Tendencies of the Last British–Irish Ice Sheet Revealed by Data–Model Comparison

<https://onlinelibrary.wiley.com/doi/10.1002/jqs.3628>

43. Biogeography of Ireland: Past, Present, and Future

<https://irishbiogeographicalsociety.com/pdf/OccPub2biogeographyIrelandIBS.pdf>

44. BRITICE-CHRONO Maps and GIS Data of the Last British-Irish Ice Sheet 31 to 15 ka

<https://doi.org/10.1594/PANGAEA.945729>

45. 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>

46. BRITICE Glacial Mapping Project

<https://www.sheffield.ac.uk/geography-planning/research/geography/projects/britice>

47. 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>

48. Castlepook Cave, County Geological Site Report

https://gsi.geodata.gov.ie/downloads/Geoheritage/Reports/CK032_Cork_CGS_Castlepook_Cave.pdf

49. Castlepook Caves

https://www.npws.ie/sites/default/files/publications/pdf/Goodwillie_1986_ASI_Cork.pdf

50. Cave Exploration in Ireland

<https://www.nature.com/articles/069189a0>

51. Celtic Sea linear tidal sand ridges, the Irish Sea Ice Stream and the Fleuve Manche: Palaeotidal modelling of a transitional passive margin depositional system

<https://www.sciencedirect.com/science/article/pii/S0025322709000061>

52. Cenozoic: Tertiary and Quaternary (until 11,700 Years Before 2000)

<https://files.core.ac.uk/download/pdf/297011667.pdf>

53. Chapter 2: Changing State of the Climate System

<https://www.ipcc.ch/report/ar6/wg1/chapter/chapter-2/>

54. 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

55. 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>

56. 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>

57. Climate Change and Hunter Gatherers in Ireland: Problems, Potentials and Pressing Research Questions

<https://researchrepository.ucd.ie/entities/publication/3a076621-5bd0-483a-9721-a227af59f136>

58. Climate Change and Hunter Gatherers in Ireland: Problems, Potentials and Pressing Research Questions

<https://doi.org/10.3318/priac.2020.120.01>

59. Composition and Consequences of the IntCal20 Radiocarbon Calibration Curve

<https://www.cambridge.org/core/journals/quaternary-research/article/abs/composition-and-consequences-of-the-intcal20-radiocarbon-calibration-curve/D7CFA50B4447F0F7172F8AC1B7DCB43B>

60. Could Brown Bears (Ursus arctos) Have Survived in Ireland During the Last Glacial Maximum?

<https://doi.org/10.1098/rsbl.2013.0281>

61. Could brown bears have survived in Ireland during the Last Glacial Maximum?

<https://pmc.ncbi.nlm.nih.gov/articles/PMC3730640/>

62. County Geological Heritage Audit Reports

<https://gsi.ie/programmes-projects/geoheritage/geoheritage-activities/county-geological-heritage-audits/county-geological-heritage-audit-reports/>

63. Cutmarks and Carcass Decay

<https://www.nhm.ac.uk/our-science/research/projects/cutmarks-carcass-decay.html>

64. Cut Marks on Bone Surfaces: Influences on Variation in the Form of Traces of Ancient Behaviour

<https://pubmed.ncbi.nlm.nih.gov/27274806/>

65. CV17040 Irish Sea Palaeolandscape Investigation Survey

https://data.gov.ie/en_GB/dataset/cv17040-irish-sea-palaeolandscape-investigation-survey

66. **Dansgaard-Oeschger Events in Climate Models: Review and Baseline Marine Isotope Stage 3 Protocol**
<https://doi.org/10.5194/cp-19-915-2023>
67. **Dansgaard-Oeschger events in climate models: review and baseline Marine Isotope Stage 3 protocol**
<https://cp.copernicus.org/articles/19/915/2023/index.html>
68. **Dating Constraints on the Last British-Irish Ice Sheet: A Map and Database**
<https://www.tandfonline.com/doi/pdf/10.4113/jom.2011.1145>
69. **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/>
70. **Deglaciation chronology of the Donegal Ice Centre, north-west Ireland**
<https://onlinelibrary.wiley.com/doi/full/10.1002/jqs.3077>
71. **Deglaciation Chronology of the Donegal Ice Centre, North-West Ireland**
<https://doi.org/10.1002/jqs.3077>
72. **Deglaciation Chronology of the Donegal Ice Centre, North-West Ireland**
<https://onlinelibrary.wiley.com/doi/10.1002/jqs.3077>
73. **Deglaciation chronology of the Donegal Ice Centre, northwest Ireland**
<https://pure.ulster.ac.uk/en/publications/deglaciation-chronology-of-the-donegal-ice-centre-northwest-ireland/>
74. **Deglaciation of the Burren Glacio-Karst, Western Ireland, During Termination 1**
<https://onlinelibrary.wiley.com/doi/full/10.1002/jqs.70068>
75. **Derrylin Complex**
<https://www.habitas.org.uk/escr/site.asp?Item=487>
76. **Dimensions and chronology of the last ice sheet in Western Ireland**
<https://www.sciencedirect.com/science/article/abs/pii/S0277379107003022>
77. **Dimensions and Chronology of the Last Ice Sheet in Western Ireland**
<https://doi.org/10.1016/j.quascirev.2007.10.019>
78. **Dimensions and Chronology of the Last Ice Sheet in Western Ireland**
<https://doi.org/10.1016/j.quascirev.2007.11.012>
79. **Dimensions and Chronology of the Last Ice Sheet in Western Ireland**
https://www.researchgate.net/publication/221947864_Dimensions_and_chronology_of_the_last_ice_sheet_in_Western_Ireland
80. **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/>
81. **Dimensions and Chronology of the Last Ice Sheet in Western Ireland**
<https://doi.org/10.1016/j.quascirev.2007.11.006>
82. **Distribution and Range Expansion of Deer in Ireland**
<https://doi.org/10.1111/j.1365-2907.2010.00170.x>
83. **Dryas octopetala**
<https://fermanagh.bsbi.org/dryas-octopetala-l>
84. **Dual ancestries and ecologies of the Late Glacial Palaeolithic in Britain**
<https://www.nature.com/articles/s41559-022-01883-z>
85. **Dynamic Cycles, Ice Streams and Their Impact on the Extent, Chronology and Deglaciation of the British-Irish Ice Sheet**
https://www.researchgate.net/publication/222890081_Dynamic_cycles_ice_streams_and_their_impact_on_the_extent_chronology_and_deglaciation_of_the_British-Irish_Ice_Sheet
86. **Early Deglaciation of the British-Irish Ice Sheet on the Atlantic Shelf**
<https://eprints.whiterose.ac.uk/140069/8/1-s2.0-S0277379117306157-main.pdf>
87. **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/>

88. **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>
89. **Early deglaciation of the British-Irish Ice Sheet on the Atlantic shelf northwest of Ireland driven by glacioisostatic depression and high relative sea level**
<https://eprints.whiterose.ac.uk/140069/>
90. **Early deglaciation of western Ireland**
<https://livrepository.liverpool.ac.uk/3033771/1/OCofaighetal2019Early%20deglaciation%20of%20western%20Ireland.pdf>
91. **Early Midlandian–Middle Midlandian, Pleistocene, Northern Ireland**
https://earthwise.bgs.ac.uk/index.php/Early_Midlandian%E2%80%93Middle_Midlandian,_Pleistocene,_Northern_Ireland
92. **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
93. **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>
94. **Episodic speleothem deposition tracks the terrestrial impact of millennial-scale last glacial climate variability in SW Ireland**
<https://www.sciencedirect.com/science/article/abs/pii/S0277379116303699>
95. **Episodic Speleothem Deposition Tracks the Terrestrial Impact of Millennial-Scale Last Glacial Climate Variability in SW Ireland**
<https://doi.org/10.1016/j.quascirev.2016.08.001>
96. **Episodic Speleothem Deposition Tracks the Terrestrial Impact of Millennial-Scale Last Glacial Climate Variability in SW Ireland**
<https://centaur.reading.ac.uk/68373/>
97. **Episodic speleothem deposition tracks the terrestrial impact of millennial-scale North Atlantic climate variability during MIS3**
<https://files01.core.ac.uk/download/pdf/74206935.pdf>
98. **Evidence for high-frequency late Glacial to mid-Holocene climate variability from oxygen isotope values of Lough Inchiquin, Ireland**
<https://doi.org/10.1017/qua.2016.10>
99. **Evidence from personal ornaments suggest nine distinct cultural groups between 34,000 and 24,000 years ago in Europe**
<https://doi.org/10.1038/s41562-023-01803-6>
100. **Exhibition Galleries: National Museum of Ireland – Natural History**
https://www.museum.ie/getmedia/548be922-4e00-4c0a-8721-1f34cf1c2e51/NMI_NHFP_Eng.pdf
101. **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>
102. **Exploring controls of the early and stepped deglaciation on the western margin of the British Irish Ice Sheet**
https://research-repository.st-andrews.ac.uk/bitstream/10023/23305/1/Benetti_2021_JQS_Exploring_CC.pdf
103. **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>
104. **Exploring Controls of the Early and Stepped Deglaciation on the Western Margin of the British Irish Ice Sheet**
<https://onlinelibrary.wiley.com/doi/10.1002/jqs.3315>
105. **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>
106. **Extent and deglacial chronology of the last British-Irish ice sheet; implications of exposure dating using cosmogenic isotopes**
<https://hero.epa.gov/reference/1282551/>
107. **Extent and deglacial chronology of the last British–Irish Ice Sheet: implications of exposure dating using cosmogenic isotopes**
<https://onlinelibrary.wiley.com/doi/10.1002/jqs.1310>

108. 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>

109. 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>

110. Extent and Retreat History of the Barra Fan Ice Stream Offshore Western Scotland and Northern Ireland During the Last Glaciation

<https://research.bangor.ac.uk/en/publications/extent-and-retreat-history-of-the-barra-fan-ice-stream-offshore-w/>

111. Extent and Timing of the Last Glacial Maximum (LGM) in Britain and Ireland: A Review

<https://doi.org/10.1002/jqs.1404>

112. Extent and Timing of the Last Glacial Maximum in Britain and Ireland: A Review

<https://onlinelibrary.wiley.com/doi/abs/10.1002/jqs.1404>

113. Field Guides

<https://iqua.ie/publications/field-guides/>

114. First evidence of a Late Upper Palaeolithic human presence in Ireland

<https://doi.org/10.1016/j.quascirev.2016.07.003>

115. 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/>

116. First evidence of a Late Upper Palaeolithic human presence in Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0277379116300610>

117. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

<https://doi.org/10.1016/j.quascirev.2016.02.029>

118. First evidence of a Late Upper Palaeolithic human presence in Ireland

<https://doi.org/10.1016/j.quascirev.2016.07.012>

119. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

<https://doi.org/10.1016/j.quascirev.2016.07.029>

120. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

<https://mariondowd.com/wp-content/uploads/2025/04/2016-qsr-palaeolithic-ireland.pdf>

121. Genetic Turnovers and Northern Survival During the Last Glacial Maximum in European Brown Bears

<https://doi.org/10.1002/ece3.5172>

122. Geological Mapping Programme

<https://www.gsi.ie/ga-ie/programmes-and-projects/geological-mapping/pages/default.aspx>

123. Geology of Ireland

<https://www.gsi.ie/ga-ie/geoscience-topics/geology/pages/geology-of-ireland.aspx>

124. Geology of Ireland

<https://www.gsi.ie/en-ie/geoscience-topics/geology/Pages/Geology-of-Ireland.aspx>

125. Geology of the Rockall Basin and Adjacent Areas

<https://webapps.bgs.ac.uk/memoirs/docs/B06844.html>

126. Glacial geomorphology in the Wicklow Mountains, Ireland

<https://doi.org/10.1080/17445647.2022.2132885>

127. Global distribution of centennial-scale records for Marine Isotope Stage 3: a database

<https://www.sciencedirect.com/science/article/pii/S0277379101001391>

128. Growth, dynamics and deglaciation of the last British–Irish ice sheet: the deep-sea ice-rafted detritus record

<https://www.bas.ac.uk/data/our-data/publication/growth-dynamics-and-deglaciation-of-the-last-british-irish-ice-sheet-the-deep-sea-ice-rafted-detritus-record/>

129. 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>

130. Growth and Retreat of the Last British–Irish Ice Sheet, 31,000 to 15,000 Years Ago: Open-Access PDF

<https://pure.ulster.ac.uk/ws/portalfiles/portal/104683424/bor.12594.pdf>

131. 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/>

132. 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>

133. Growth and Retreat of the Last British–Irish Ice Sheet, 31,000 to 15,000 Years Ago: The BRITICE-CHRONO Reconstruction

<https://onlinelibrary.wiley.com/doi/full/10.1111/bor.12594>

134. 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>

135. 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>

136. 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>

137. 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>

138. Growth and Retreat of the Last British–Irish Ice Sheet, 31,000 to 15,000 Years Ago: The BRITICE-CHRONO Reconstruction

<https://nora.nerc.ac.uk/id/eprint/533160/>

139. Growth and Retreat of the Last British–Irish Ice Sheet, 31,000 to 15,000 Years Ago: the BRITICE-CHRONO Reconstruction

<https://doi.org/10.1002/2019RG000651>

140. Growth and Retreat of the Last British–Irish Ice Sheet, 31,000 to 15,000 Years Ago: The BRITICE-CHRONO Reconstruction

<https://durham-repository.worktribe.com/output/1190460/growth-and-retreat-of-the-last-british-irish-ice-sheet-31-000-to-15-000-years-ago-the-briticechron-reconstruction>

141. Growth and Retreat of the Last British–Irish Ice Sheet, 31,000 to 15,000 Years Ago: The BRITICE-CHRONO Reconstruction

<https://eprints.whiterose.ac.uk/id/eprint/190923/>

142. Guide to the National Museum of Ireland

https://www.museum.ie/getmedia/a3ebbb22-2057-4200-aae8-cd958854d89f/ks_guide_web_en-%281%29.pdf

143. 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

144. H.A.R.P.: investigating Mesolithic landscapes of life and death at the western edge of Europe

<https://www.cambridge.org/core/journals/antiquity/article/harp-investigating-mesolithic-landscapes-of-life-and-death-at-the-western-edge-of-europe/8E66BC66B12F5E3D952C3254AE48852F>

145. Heritage Artefacts of County Cork

<https://www.corkcoco.ie/sites/default/files/2023-06/heritage-artefacts-of-county-cork-2021.pdf>

146. High-resolution record of Northern Hemisphere climate extending into the last interglacial period

<https://doi.org/10.1038/nature02805>

147. Homo sapiens Reached the Higher Latitudes of Europe by 45,000 Years Ago

<https://doi.org/10.1038/s41586-023-06923-7>

148. Hydrographic Survey Data Uncovers Preserved Glacial Landscape

<https://www.gov.uk/government/news/hydrographic-survey-data-uncovers-preserved-glacial-landscape>

149. IAH Field Trip 2014

<https://www.iah-ireland.org/field-guides/2014.pdf>

150. Ice Age Ireland: Cool Fossils!

https://www.museum.ie/getmedia/acab45bf-2252-4f25-9cf0-c0268f0c7f0d/Ice_Age_Activity_Overview.pdf

151. Ice Age Ireland: Woolly Mammoth Activity Sheet

https://www.museum.ie/getmedia/48b32fce-19cc-4d70-8e6f-2cf2d7aff73f/Ice_Age_Activity_Mammoth.pdf

152. Ice Age Ireland – Cool Fossils

<https://cms.museum.ie/en-IE/Museums/Natural-History/Engage-And-Learn/Schools-Educational-Visits/Primary/fgdgd>

153. Ice sheet extension to the Celtic Sea shelf edge at the Last Glacial Maximum

<https://www.sciencedirect.com/science/article/abs/pii/S0277379114004934>

154. IE GSI Quaternary Geomorphology 50K Ireland Feature Service Metadata

https://gsi.geodata.gov.ie/server/rest/services/Quaternary/IE_GSI_Quaternary_Geomorphology_50K_IE26_ITM/FeatureServer/6/metadata?f=html&format=default

155. IE GSI Quaternary Geomorphology 50K Ireland MapServer

https://gsi.geodata.gov.ie/server/rest/services/Quaternary/IE_GSI_Quaternary_Geomorphology_50K_IE26_ITM/MapServer

156. IntCal20

<https://intcal.org/index.html>

157. IntCal20

<https://www.cambridge.org/core/journals/radiocarbon/calibrations/intcal-20>

158. IntCal Data

<https://www.intcal.org/data.html>

159. IntCal Publications

<https://intcal.org/publications.html>

160. IntCal Publications

<https://www.intcal.org/publications.html>

161. Introduction to the Late Quaternary and Holocene of Northern Ireland

<https://www.habitas.org.uk/escr/site.asp?Item=101>

162. Investigating Seasonal Mobility in Irish Giant Deer (*Megaloceros giganteus*)

https://research-portal.uu.nl/files/139756950/J_Quaternary_Science_2022_Douw_Investigating_seasonal_mobility_in_Irish_giant_deer_Megaloceros_giganteus_Blumenbach_.pdf

163. Investigating seasonal mobility in Irish giant deer *Megaloceros giganteus* (Blumenbach, 1799) through strontium isotope (⁸⁷Sr/⁸⁶Sr) analysis

<https://onlinelibrary.wiley.com/doi/10.1002/jqs.3447>

164. Ireland's First Settlers: Time and the Mesolithic

<https://www.everand.com/book/295852825/Ireland-s-First-Settlers-Time-and-the-Mesolithic>

165. 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/>

166. Ireland: Submerged Prehistoric Sites and Landscapes

https://link.springer.com/chapter/10.1007/978-3-030-37367-2_11

167. Ireland: Submerged Prehistoric Sites and Landscapes

https://doi.org/10.1007/978-3-030-37367-2_11

168. Ireland: Submerged Prehistoric Sites and Landscapes

<https://cora.ucc.ie/handle/10468/9883?show=full>

169. Ireland: Submerged Prehistoric Sites and Landscapes

https://pure.ulster.ac.uk/ws/portalfiles/portal/78797612/IrelandSubmergedPrehistoricSit_chapter.pdf

170. Ireland Through Geological Time

<https://www.gsi.ie/en-ie/education/the-geology-of-ireland/Pages/Ireland-through-geological-time.aspx>

171. Ireland Through Geological Time

<https://gsi.ie/education/the-geology-of-ireland/ireland-through-geological-time/>

172. Ireland Under The Ice

<https://joycecountrygeoparkproject.ie/en/geological-stories/ireland-under-the-ice/>

173. Ireland's Earliest Settlers: Evidence for an Irish Palaeolithic

https://pure.qub.ac.uk/files/373000291/JSmall_thesis_final_2.pdf

174. Ireland's Maritime Archaeology: Our Ancient Coastal Landscapes

https://www.heritagecouncil.ie/content/files/irelands_maritime_archaeology_2006_1mb.pdf

175. Irish Cave Exploration

<https://www.nature.com/articles/012212b0>

176. Irish Cave Exploration

<https://doi.org/10.1038/012212b0>

177. Irish Caves Database: Mammoth Cave, Castlepook

<https://irishcaves.ubss.org.uk/gazetteer/cork/mammoth-cave/>

178. Irish Fauna: Ground Floor

https://www.museum.ie/getmedia/cd11862c-a1a7-4691-a39f-d8f77f2268ea/nhm_guide_web_en.pdf

179. Irish Fossil Brown Bear (*Ursus arctos*) Records

<https://maps.biodiversityireland.ie/Dataset/445>

180. Irish Pleistocene Biostratigraphy

https://www.researchgate.net/publication/290822499_Irish_Pleistocene_biostratigraphy

181. Irish Quaternary Association

<https://iqua.ie/>

182. Irish Quaternary Association Publications

<https://iqua.ie/publications/>

183. Irish Quaternary Vertebrates

https://doi.org/10.2991/978-94-6239-219-9_9

184. Irish Quaternary Vertebrates

https://www.researchgate.net/publication/309313860_Irish_Quaternary_Vertebrates

185. Karst of Ireland

https://gsi.geodata.gov.ie/downloads/Groundwater/Other/GSI_Karst_of_Ireland_David_Drew_2018.pdf

186. Landform Modification by Palaeo-Ice Streams in East-Central Ireland

<https://www.cambridge.org/core/journals/annals-of-glaciology/article/landform-modification-by-palaeo-ice-streams-in-east-central-ireland/AF897D89C945C41287CB51097A79F48A>

187. 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

188. 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>

189. Last Glacial Maximum cirque glaciation in Ireland and implications for reconstructions of the Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2016.10.032>

190. 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>

191. Last Glacial Maximum Cirque Glaciation in Ireland and Implications for Reconstructions of the Irish Ice Sheet

<https://pure.ulster.ac.uk/en/publications/last-glacial-maximum-cirque-glaciation-in-ireland-and-implication/>

192. Late Glacial and Holocene Aeolian Deposition and Soil Formation in Relation to the Late Palaeolithic Ahrensburg Occupation, Site Geldrop-A2, the Netherlands

<https://www.cambridge.org/core/journals/netherlands-journal-of-geosciences/article/late-glacial-and-holocene-aeolian-deposition-and-soil-formation-in-relation-to-the-late-palaeolithic-ahrensburg-occupation-site-geldrop-a2-the-netherlands/CA10F0864C00DC0047AFE4CB473D63D4>

193. Lateglacial Vegetation and Environment in Ireland: First Results from Four Western Sites

<https://www.sciencedirect.com/science/article/pii/S0277379193900079>

194. Late Midlandian, Pleistocene, Northern Ireland

https://earthwise.bgs.ac.uk/index.php/Late_Midlandian%2C_Pleistocene%2C_Northern_Ireland

195. Late Pleistocene chronostratigraphy and ice sheet limits, southern Ireland

<https://researchportal.plymouth.ac.uk/en/publications/late-pleistocene-chronostratigraphy-and-ice-sheet-limits-southern/>

196. Late Pleistocene chronostratigraphy and ice sheet limits, southern Ireland

<https://doi.org/10.1016/j.quascirev.2010.01.011>

197. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0277379110000132>

198. Late Pleistocene chronostratigraphy and ice sheet limits, southern Ireland

<https://doi.org/10.1016/j.quascirev.2010.01.010>

199. Late Pleistocene chronostratigraphy and ice sheet limits, southern Ireland

https://www.researchgate.net/publication/229374613_Late_Pleistocene_chronostratigraphy_and_ice_sheet_limits_southern_Ireland

200. Late Pleistocene chronostratigraphy and ice sheet limits, southern Ireland

<https://durham-repository.worktribe.com/output/1486214>

201. 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>

202. Making Yourself at Home on an Island: The First 1000 Years (+?) of the Irish Mesolithic

<https://www.cambridge.org/core/journals/proceedings-of-the-prehistoric-society/article/abs/making-yourself-at-home-on-an-island-the-first-1000-years-of-the-irish-mesolithic/21AA60BEF106818487E375A8EC5605C0>

203. Mammals: National Museum of Ireland Natural History Collections

<https://cms.museum.ie/en-IE/Collections-Research/Natural-History-Collections/Collections-List/Mammals>

204. 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>

205. Marine20—The Marine Radiocarbon Age Calibration Curve (0–55,000 cal BP)

<https://doi.org/10.1017/RDC.2020.68>

206. Marine Institute Releases New Seabed Geomorphology Map

<https://www.marine.ie/site-area/news-events/press-releases/marine-institute-releases-new-seabed-geomorphology-map>

207. Marine isotope stage 3 sea level fluctuations: Data synthesis and new outlook

<https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2007RG000226>

208. Maximum extent and dynamic behaviour of the last British-Irish Ice Sheet west of Ireland

<https://doi.org/10.1016/j.quascirev.2015.08.010>

209. Maximum extent and dynamic behaviour of the last British–Irish Ice Sheet west of Ireland

<https://www.sciencedirect.com/science/article/pii/S027737911530113X>

210. Maximum Extent and Dynamic Behaviour of the Last British–Irish Ice Sheet West of Ireland

<https://doi.org/10.1016/j.quascirev.2015.08.019>

211. 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>

212. Maximum Extent and Dynamic Behaviour of the Last British–Irish Ice Sheet West of Ireland

https://www.researchgate.net/publication/282451488_Maximum_extent_and_dynamic_behaviour_of_the_last_British-Irish_Ice_Sheet_west_of_Ireland

213. Maximum extent and dynamic behaviour of the last British–Irish Ice Sheet west of Ireland

<https://doi.org/10.1016/j.quascirev.2015.07.003>

214. Maximum Extent and Dynamic Behaviour of the Last British–Irish Ice Sheet West of Ireland

<https://doi.org/10.1016/j.quascirev.2015.09.019>

215. Maximum Extent and Dynamic Behaviour of the Last British–Irish Ice Sheet West of Ireland

<https://doi.org/10.1016/j.quascirev.2015.08.026>

216. Maximum Extent and Dynamic Behaviour of the Last British–Irish Ice Sheet West of Ireland

<https://doi.org/10.1016/j.quascirev.2015.08.015>

217. Maximum Extent and Dynamic Behaviour of the Last British–Irish Ice Sheet West of Ireland

<https://doi.org/10.1016/j.quascirev.2015.10.006>

218. Maximum Extent and Dynamic Behaviour of the Last British–Irish Ice Sheet West of Ireland

<https://doi.org/10.1016/j.quascirev.2015.10.002>

219. Maximum Extent and Dynamic Behaviour of the Last British–Irish Ice Sheet West of Ireland

<https://doi.org/10.1016/j.quascirev.2015.07.019>

220. Maximum Extent and Readvance Dynamics of the Irish Sea Ice Stream and Irish Sea Glacier Since the Last Glacial Maximum

<https://livrepository.liverpool.ac.uk/3124994/>

221. Maximum extent and readvance dynamics of the Irish Sea Ice Stream and Irish Sea Glacier since the Last Glacial Maximum

<https://eprints.whiterose.ac.uk/174565/1/jqs.3313.pdf>

222. Maximum Extent and Readvance Dynamics of the Irish Sea Ice Stream and Irish Sea Glacier Since the Last Glacial Maximum

<https://onlinelibrary.wiley.com/doi/full/10.1002/jqs.3313>

223. 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>

224. 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>

225. *Menyanthes trifoliata*

<https://fermanagh.bsbi.org/menyanthes-trifoliata-l>

226. Mesolithic – Iron Age

<https://heritageireland.ie/ga/ailt/mesolithic-iron-age-8000bc-400ad/>

227. Middle Midlandian Freshwater Series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland

<https://doi.org/10.1098/rspb.1972.0018>

228. Middle Midlandian Freshwater Series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland

<https://pure.ulster.ac.uk/en/publications/middle-midlandian-freshwater-series-at-derryvree-maguiresbridge-c-3/>

229. Middle Midlandian Interstadial Deposits at Greenagho, Near Belcoo, County Fermanagh, Northern Ireland

<https://www.jstor.org/stable/30002377>

230. Modelled Relative Sea-Level Histories for the Northwest Coast of Ireland

<https://nora.nerc.ac.uk/id/eprint/513300/1/Plots%20et%20al%202015%20Mar%20Geol.pdf>

231. New Age Constraints for the Maximum Extent of the Last British-Irish Ice Sheet (NW Sector)

<https://nora.nerc.ac.uk/id/eprint/21216/>

232. New Data for the Last Glacial Maximum in Great Britain and Ireland

<https://pure.ulster.ac.uk/en/publications/new-data-for-the-last-glacial-maximum-in-great-britain-and-irelan-3/>

233. New Data for the Last Glacial Maximum in Great Britain and Ireland

<https://www.sciencedirect.com/science/article/pii/S0277379101001020>

234. New Data for the Last Glacial Maximum in Great Britain and Ireland

[https://doi.org/10.1016/S0277-3791\(01\)00102-8](https://doi.org/10.1016/S0277-3791(01)00102-8)

235. New Data for the Last Glacial Maximum in Great Britain and Ireland

[https://doi.org/10.1016/S0277-3791\(01\)00109-3](https://doi.org/10.1016/S0277-3791(01)00109-3)

236. New insights on the fauna of Ireland's Younger Dryas and Early Holocene from Alice & Gwendoline Cave

<https://doi.org/10.1016/j.quascirev.2024.108827>

237. 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>

238. New Insights on the Fauna of Ireland's Younger Dryas and Early Holocene from Alice & Gwendoline Cave

https://clarecastleballyea.clareheritage.org/wp-content/uploads/sites/5/2025/03/New_insights_on_the_fauna_of_Irelands_Yo_compressed.pdf

239. NGRIP Ice-Core Data and the GICC05modelext Timescale

<https://nbi.ku.dk/english/research/pice/centre-for-ice-and-climate/data/>

240. Occurrence of mammalia relicts at site Castlepook Cave

<https://doi.pangaea.de/10.1594/PANGAEA.63585>

241. 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

242. On the Cave of Castlepook, Near Doneraile, Co. Cork

<https://doi.org/10.1017/S0016756800122435>

243. 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.2002.01750.x>

244. Origin of British and Irish Mammals: Disparate Post-Glacial Colonisation and Species Introductions

<https://doi.org/10.1016/j.quascirev.2014.05.026>

245. 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>

246. 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>

247. Oscillating retreat of the last British-Irish Ice Sheet on the continental shelf offshore Galway Bay, western Ireland

<https://eprints.gla.ac.uk/206157/>

248. Outreach and Education Resources

<https://iqua.ie/outreach-and-education-resources/>

249. Overview of the European Upper Palaeolithic: The Homo sapiens Bone Record

<https://doi.org/10.1016/j.jasrep.2024.104391>

250. OxCal Online

<https://c14.arch.ox.ac.uk/oxcal.html>

251. Palaeobiology of an Extinct Ice Age Mammal: Stable Isotope and Cementum Analysis of Giant Deer Teeth

<https://www.sciencedirect.com/science/article/pii/S0031018209003411>

252. Palaeoecology

<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-16-600dpi.pdf>

253. Palaeoenvironmental Research Unit

<https://www.universityofgalway.ie/pru/>

254. Palaeogenomics of Upper Palaeolithic to Neolithic European hunter-gatherers

<https://doi.org/10.1038/s41586-023-05726-0>

255. 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>

256. Pattern, Style and Timing of British–Irish Ice Sheet Retreat: Shetland and Northern North Sea Sector

<https://doi.org/10.1002/jqs.3163>

257. Pattern and timing of retreat of the last British-Irish Ice Sheet

<https://nora.nerc.ac.uk/id/eprint/507486/>

258. Pattern and Timing of Retreat of the Last British-Irish Ice Sheet

<https://www.sciencedirect.com/science/article/pii/S0277379110002817>

259. Pattern and Timing of Retreat of the Last British-Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2011.09.024>

260. Pattern and Timing of Retreat of the Last British–Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2010.07.019>

261. Paviland Cave: contextualizing the ‘Red Lady’

<https://www.cambridge.org/core/journals/antiquity/article/abs/paviland-cave-contextualizing-the-red-lady/1CE7AB86DAB0DCE1CFEBB4B3E9A2DD13>

262. Paviland Cave: Contextualizing the ‘Red Lady’

<https://doi.org/10.15184/aqy.2014.21>

263. Peatland Archaeology

<https://www.heritagecouncil.ie/content/files/Peatland-Archaeology.pdf>

264. Phylogeographic, Ancient DNA, Fossil and Morphometric Analyses Reveal Ancient and Modern Introductions of a Large Mammal: The Complex Case of Red Deer (*Cervus elaphus*) in Ireland

<https://doi.org/10.1016/j.quascirev.2012.02.012>

265. 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.sciencedirect.com/science/article/abs/pii/S0277379112000856>

266. Physiographic Units Map of Ireland: Report

https://gsi.geodata.gov.ie/downloads/Quaternary/Reports/Physiographic_Units_Map_of_Ireland_REPORT.pdf

267. Pleistocene vertebrates in the British Isles

<https://rhinoresourcecenter.com/wp-content/uploads/2012/04/1336577813.pdf>

268. Pleistocene Vertebrates in the British Isles

https://www.rhinoresourcecenter.com/pdf_files/133/1336577813.pdf

269. Post-Glacial Relative Sea-Level Observations from Ireland and Their Role in Glacial Rebound Modelling

<https://www.tara.tcd.ie/items/fc2b75e6-d093-462a-8904-81257701605a>

270. Postglacial relative sea-level observations from Ireland and their role in glacial rebound modelling

<https://onlinelibrary.wiley.com/doi/abs/10.1002/jqs.1119>

271. 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)

272. Prehistoric Details

<https://source.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-%281%29/Stone-Age/Prehistoric-Details>

273. 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)

274. Prehistoric Details: Mell Flint Flake

<https://cms.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-%281%29/Stone-Age/Prehistoric-Details>

275. Prehistoric Ireland

<https://source.museum.ie/en-IE/Museums/Archaeology/Exhibitions/Prehistoric-Ireland>

276. Proceedings of the Royal Irish Academy: Castlepook Cave faunal report

https://upload.wikimedia.org/wikipedia/commons/d/da/Proceedings_of_the_Royal_Irish_Academy_%281A_proceedings%29.pdf

277. 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/>

278. Quaternary

<https://www.gsi.ie/data-and-maps/quaternary/>

279. Quaternary Deposits and Glacial Stratigraphy in Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0277379187900084>

280. Quaternary Geological Map of Ireland

https://inchheritage.org/dist/resources/Quaternary_500k_All_Ireland_Map.pdf

281. Quaternary Geology

<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-28-Corrected-after-print-version.pdf>

282. Quaternary Geology of Ireland

<https://www.gsi.ie/ga-ie/data-and-maps/Pages/Quaternary.aspx>

283. Quaternary Geomorphology, Geological Survey Ireland

<https://www.gsi.ie/en-ie/data-and-maps/Pages/Quaternary.aspx>

284. 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>

285. Quaternary Site Descriptions

<https://iqua.ie/wp-content/uploads/2020/10/Quaternary-sites-of-Ireland-map-INQUA-2019.pdf>

286. Radiocarbon

<https://archeox.conted.ox.ac.uk/fact-sheets/chronology/dating-methods/radiocarbon.html>

287. **Radiocarbon, Volume 16, Number 1: Geological Samples, including Castlepook Cave**
<https://journals.uair.arizona.edu/index.php/radiocarbon/article/viewFile/381/386>
288. **Radiocarbon chronology for the Early Gravettian of northern Europe: new AMS determinations for Maisières-Canal, Belgium**
<https://www.cambridge.org/core/journals/antiquity/article/abs/radiocarbon-chronology-for-the-early-gravettian-of-northern-europe-new-ams-determinations-for-maisierescanal-belgium/6EAC3ABD991AF934D9DCBE3980ADD99E>
289. **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>
290. **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>
291. **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>
292. **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>
293. **Radiocarbon constraints on the history of the western Irish ice sheet prior to the Last Glacial Maximum**
<https://doi.org/10.1130/G23167A.1>
294. **Radiocarbon Dates from the Oxford AMS System: Archaeometry Datelist 31**
<https://doi.org/10.1111/j.1475-4754.2002.tb01101.x>
295. **Radiocarbon Dates from the Oxford AMS System: Archaeometry Datelist 31**
<https://onlinelibrary.wiley.com/doi/10.1111/j.1475-4754.2002.tb01101.x>
296. **Radiocarbon Dating and Chronological Modelling: Radiocarbon Dating**
<https://historicalengland.org.uk/images-books/publications/radiocarbon-dating-chronological-modelling/radiocarbon-dating/>
297. **Rapid glaciation and a two-step sea level plunge into the Last Glacial Maximum**
<https://www.nature.com/articles/s41586-018-0335-4>
298. **Rapid response of climatic conditions during the last glacial: evidence from U-series dated Irish speleothems**
https://www.researchgate.net/publication/258617696_Rapid_response_of_climatic_conditions_during_the_last_glacial_evidence_from_U-series_dated_Irish_speleothems
299. **Recent Developments in Calibration for Archaeological and Environmental Samples**
<https://eprints.gla.ac.uk/210774/>
300. **Recent Developments in Calibration for Archaeological and Environmental Samples**
<https://doi.org/10.1017/RDC.2020.42>
301. **Reconstructing the last Irish Ice Sheet 2: a geomorphologically-driven model of ice sheet growth, retreat and dynamics**
<https://doi.org/10.1016/j.quascirev.2009.09.014>
302. **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>
303. **Reconstruction and ³⁶Cl Based Geochronology of the Deglaciation of Central Ireland**
<https://eprints.gla.ac.uk/381095/>
304. **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/>
305. **Relative Sea-Level Changes and Crustal Movements in Britain and Ireland Since the Last Glacial Maximum**
<https://www.sciencedirect.com/science/article/abs/pii/S0277379118300040>
306. **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
307. **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/>
308. **Response of the Irish Ice Sheet to Abrupt Climate Change During the Last Deglaciation**
<https://doi.org/10.1016/j.quascirev.2012.01.001>

309. Restricted cirque glaciers in the Wicklow Mountains, Ireland, during the Nahanagan Stadial (Greenland Stadial-1/Younger Dryas)

<https://onlinelibrary.wiley.com/doi/10.1002/jqs.3699>

310. 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/>

311. Revisiting Alice and Gwendoline Cave, Co. Clare: New Light on the 1902 Excavations

<https://doi.org/10.3318/PRIAC.2021.121.07>

312. Revisiting Alice and Gwendoline Cave, Co. Clare: New Light on the 1902 Excavations

https://www.researchgate.net/publication/357691009_Revisiting_Alice_and_Gwendoline_Cave_Co_Clare_new_light_on_the_1902_excavations

313. Revisiting Alice and Gwendoline Cave, Co. Clare: New Light on the 1902 Excavations

https://clarecastleballyea.clareheritage.org/wp-content/uploads/sites/5/2025/03/Revisiting_Alice_and_Gwendoline_Cave_Co_compressed.pdf

314. Sea-level change and inner shelf stratigraphy off Northern Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0025322706000909>

315. Sedimentary Ancient DNA Reveals Late Pleistocene Faunal Connectivity Between Ireland and Eurasia

<https://www.biorxiv.org/content/10.64898/2026.07.10.737191v1>

316. Sedimentary Ancient DNA Reveals Late Pleistocene Faunal Connectivity Between Ireland and Eurasia

https://labs.society.org/articles/by?article_doi=10.64898%2F2026.07.10.737191

317. Sedimentary ancient DNA reveals Late Pleistocene faunal connectivity between Ireland and Eurasia

<https://doi.org/10.64898/2026.07.10.737191>

318. 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>

319. 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/>

320. Sedimentology and Chronology of the Advance and Retreat of the Last British-Irish Ice Sheet on the Continental Shelf West of Ireland

<https://pure.ulster.ac.uk/en/publications/sedimentology-and-chronology-of-the-advance-and-retreat-of-the-la-3/>

321. Spatio-Temporal Dynamics of Speleothem Growth and Glaciation in the British Isles

<https://cp.copernicus.org/articles/21/261/2025/cp-21-261-2025.html>

322. Spatio-temporal dynamics of speleothem growth and glaciation in the British Isles

<https://cp.copernicus.org/articles/21/261/2025/>

323. Spatio-Temporal Dynamics of Speleothem Growth and Glaciation in the British Isles

<https://mural.maynoothuniversity.ie/id/eprint/19484/1/cp-21-261-2025.pdf>

324. Spatio-Temporal Dynamics of Speleothem Growth and Glaciation in the British Isles

<https://doi.org/10.5194/cp-21-261-2025>

325. Stable Isotopes Show Homo sapiens Dispersed into Cold Steppes ~45,000 Years Ago at Ilsehöhle in Ranis, Germany

<https://doi.org/10.1038/s41559-023-02318-z>

326. Stoats provide evidence of natural overland colonization of Ireland

<https://pmc.ncbi.nlm.nih.gov/articles/PMC2176200/>

327. Stone Age

<https://source.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-%281%29/Stone-Age>

328. Stone Age

[https://source.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-\(1\)/Stone-Age](https://source.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-(1)/Stone-Age)

329. Stone Dead: Uncovering Early Mesolithic Mortuary Rites, Hermitage, Ireland

<https://www.cambridge.org/core/journals/cambridge-archaeological-journal/article/abs/stone-dead-uncovering-early-mesolithic-mortuary-rites-hermitage-ireland/DD38A24800EA528C5E3CE27300F88B7E>

330. 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/>

331. 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>

332. 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>

333. Subglacial Bedform Geomorphology of the Irish Ice Sheet Reveals Major Configuration Changes During Growth and Decay

<https://doi.org/10.1002/jqs.627>

334. TCD Researchers Trace the Ancestry of Polar Bears to Ireland

https://www.tcd.ie/news_events/articles/tcd-researchers-trace-the-ancestry-of-polar-bears-to-ireland/

335. Terra Incognita: The Palaeolithic Record of Northwest Europe and the Information Potential of the Southern North Sea

<https://www.cambridge.org/core/journals/netherlands-journal-of-geosciences/article/terra-incognita-the-palaeolithic-record-of-northwest-europe-and-the-information-potential-of-the-southern-north-sea/085EB9BCBF3ACA457BD5DF72A83C086D>

336. Terra Incognita: The Palaeolithic Record of Northwest Europe and the Information Potential of the Southern North Sea

<https://doi.org/10.1017/njg.2014.1>

337. The 'Red Lady' Ages Gracefully: New Ultrafiltration AMS Determinations from Paviland

<https://pubmed.ncbi.nlm.nih.gov/18929395/>

338. The 'Red Lady' of Paviland

<https://oumnh.ox.ac.uk/learn-red-lady-of-paviland-0>

339. The Age and Context of the KC4 Maxilla, Kent's Cavern, UK

<https://doi.org/10.1017/eea.2016.21>

340. The Antiquity of Man in Ireland

<https://doi.org/10.1017/CBO9781316530368.007>

341. The Antiquity of Man in Ireland

<https://www.cambridge.org/core/books/abs/irish-stone-age/antiquity-of-man-in-ireland/E2F2C600F242ED3B71040EF9A7B3E38C>

342. The Archaeology of Caves in Ireland

<https://caves.org/journal-of-cave-and-karst-studies/jcks-articles/the-archaeology-of-caves-in-ireland-2/>

343. The Archaeology of Caves in Ireland

<https://www.jstor.org/stable/j.ctt16t8zkc>

344. The Archaeology of Caves in Ireland

<https://mariondowd.com/wp-content/uploads/2025/04/2015-the-archaeology-of-caves-in-ireland.pdf>

345. The Archaeology of Caves in Ireland

<https://caves.org/wp-content/uploads/Publications/JCKS/v78/cave-78-03-218.pdf>

346. The Archaeology of Ireland: From the Mesolithic to the Modern Era

<https://irisharchaeology.org/the-archaeology-of-ireland-from-the-mesolithic-to-the-modern-era/>

347. The Behavioural Ecology of Reindeer (*Rangifer tarandus*) During the Last Glaciation

<https://era.ed.ac.uk/server/api/core/bitstreams/7ce08589-8663-46a4-b92a-7cc41f5d80d4/content>

348. The Burren

<https://www.geolsoc.org.uk/science-and-policy/100-great-geosites/landscape/the-burren/>

349. The Climate and Landscape of the Middle Part of the Weichselian Glaciation in Europe: The Stage 3 Project

<https://www.cambridge.org/core/journals/quaternary-research/article/abs/climate-and-landscape-of-the-middle-part-of-the-weichselian-glaciation-in-europe-the-stage-3-project/4CA4F00D6AAF48A6F0AD828152D13D98>

350. The colonization of Ireland: A human ecology perspective

<https://www.sciencedirect.com/science/article/pii/S0277379120305941>

351. The Colonization of Ireland: A Human Ecology Perspective

<https://doi.org/10.1016/j.quascirev.2020.106632>

352. The colonization of Ireland: A human ecology perspective

<https://doi.org/10.1016/j.quascirev.2020.106421>

353. The Colonization of Ireland: A Human Ecology Perspective

https://hungarcolab.weebly.com/uploads/1/3/0/2/130279092/tune_2020_-_colonization_of_ireland.pdf

354. The colonization of Ireland: A human ecology perspective

<https://doi.org/10.1016/j.quascirev.2020.106677>

355. The Colonization of Ireland: A Human Ecology Perspective

<https://doi.org/10.1016/j.quascirev.2020.106656>

356. The deglaciation of the western sector of the Irish Ice Sheet from the inner continental shelf to its terrestrial margin

<https://eprints.gla.ac.uk/213261/>

357. The Deglaciation of the Western Sector of the Irish Ice Sheet from the Inner Continental Shelf to its Terrestrial Margin

<https://doi.org/10.1111/bor.12448>

358. The deglaciation of the western sector of the Irish Ice Sheet from the inner continental shelf to its terrestrial margin

<https://onlinelibrary.wiley.com/doi/full/10.1111/bor.12448>

359. The Deglaciation of the Western Sector of the Irish Ice Sheet from the Inner Continental Shelf to its Terrestrial Margin

<https://research-repository.st-andrews.ac.uk/handle/10023/20046>

360. The Dungarvan Valley Caves Project First Interim Report

<https://researchonline.ljmu.ac.uk/id/eprint/14938/>

361. The Earliest Evidence for Anatomically Modern Humans in Northwestern Europe

<https://doi.org/10.1038/nature10484>

362. The early prehistory in the west of Ireland: Investigations into the social archaeology of the Mesolithic, west of the Shannon, Ireland

https://lithicsireland.ie/driscoll_killian_2006_the_early_prehistory_in_the_west_of_ireland_web.pdf

363. The Early Upper Palaeolithic in British Caves: Problems and Potential

<https://doi.org/10.1111/1467-9655.14313>

364. The evolution of the terrestrial-terminating Irish Sea glacier during the last glaciation

<https://onlinelibrary.wiley.com/doi/10.1002/jqs.3229>

365. The Exploration of Castlepook Cave, Co. Cork

https://sources.nli.ie/Record/PS_UR_073459

366. The Exploration of Castlepook Cave, County Cork, Being the Third Report from the Committee Appointed to Explore Irish Caves

<https://www.jstor.org/stable/20490276>

367. The Exploration of the Caves of County Clare

<https://doi.org/10.1017/S0080440100008414>

368. The Exploration of the Caves of County Clare: Geology

https://sources.nli.ie/Record/PS_UR_021495

369. The Exploration of the Caves of County Clare: Introduction, Remarks on Animal Remains (Except Birds) and Summary of Results

https://sources.nli.ie/Record/PS_UR_089348

370. The extinction of the giant deer *Megaloceros giganteus* (Blumenbach): New radiocarbon evidence

<https://durham-repository.worktribe.com/preview/1304976/27831.pdf>

371. The Gravettian presence

<https://archeologie.culture.gouv.fr/chaudet/en/gravettian-presence>

372. The History of Red Deer in Ireland: A Multidisciplinary Approach

[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)

373. The Ice Age in Ireland

<https://www.askaboutireland.ie/narrative-notes/the-ice-age-in-ireland/index.xml>

374. 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>

- 375. The IntCal20 approach to radiocarbon calibration curve construction: a new methodology using Bayesian splines and errors-in-variables**
<https://eprints.gla.ac.uk/217180/>
- 376. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)**
<https://doi.org/10.1017/RDC.2020.41>
- 377. 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>
- 378. 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>
- 379. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)**
<https://eprints.gla.ac.uk/210753/>
- 380. 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>
- 381. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)**
<https://doi.org/10.1017/RDC.2020.41?sid=sciencopen>
- 382. The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0–55 cal kBP)**
<https://epic.awi.de/id/eprint/53055/1/reimer2020r.pdf>
- 383. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)**
<https://www.cambridge.org/core/services/aop-cambridge-core/content/view/83257B63DC3AF9CFA6243F59D7503EFF/S0033822220000417a.pdf/div-class-title-the-intcal20-northern-hemisphere-radiocarbon-age-calibration-curve-0-55-cal-kbp-div.pdf>
- 384. The Irish Elk: When and Why Did this Giant Deer Go Extinct and What Did it Look Like?**
<https://www.nhm.ac.uk/discover/irish-elk-giant-deer.html>
- 385. The Irish Quaternary: A Guide to the Evidence**
<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-17-unlocked.pdf>
- 386. The Irish Quaternary Fauna Project**
<https://www.sciencedirect.com/science/article/abs/pii/S0277379196000376>
- 387. 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)
- 388. The Irish Quaternary Fauna Project**
https://www.researchgate.net/publication/223448450_The_Irish_Quaternary_Fauna_Project
- 389. The Irish Quaternary Fauna Project**
<https://www.sciencedirect.com/science/article/pii/S0277379196000376>
- 390. The Island of Ireland: Drowning the Myth of an Irish Land-Bridge?**
<https://www.tara.tcd.ie/items/af898505-9836-458c-a5d6-78ce11d608ab>
- 391. The Island of Ireland: Drowning the Myth of an Irish Land-Bridge?**
<https://www.tara.tcd.ie/tara8/server/api/core/bitstreams/496ba918-8adf-486f-a535-e9ede845c72f/content>
- 392. The Island of Ireland: Drowning the Myth of an Irish Land-Bridge?**
<https://www.tara.tcd.ie/items/af898505-9836-458c-a5d6-7811d608ab>
- 393. The last Eurasian ice sheets – a chronological database and time-slice reconstruction, DATED-1**
<https://doi.org/10.1111/bor.12142>
- 394. The Last Glacial Maximum**
<https://doi.org/10.1126/science.1172873>
- 395. The Last Glacial Maximum**
<https://pubs.usgs.gov/publication/70036965>
- 396. The Last Glacial Maximum British–Irish Ice Sheet: A Reconstruction Using Digital Terrain Mapping**
<https://doi.org/10.1002/jqs.1143>

397. The Last Irish Ice Sheet: Extent and Chronology

https://doi.org/10.2991/978-94-6239-219-9_5

398. The Last Irish Ice Sheet: Extent and Chronology

https://www.researchgate.net/publication/309313799_The_Last_Irish_Ice_Sheet_Extent_and_Chronology

399. The Last Scottish Ice Sheet

<https://research-repository.st-andrews.ac.uk/handle/10023/16466>

400. The Late-Glacial Sequence in Britain and Ireland

<https://www.cambridge.org/core/books/abs/irish-stone-age/lateglacial-sequence-in-britain-and-ireland/35FF9B72891020A793693C25E8324765>

401. The Late-Glacial Sequence in Britain and Ireland

<https://doi.org/10.1017/CBO9781316530368.005>

402. The Late Devensian (

[https://doi.org/10.1016/0277-3791\(89\)90034-6](https://doi.org/10.1016/0277-3791(89)90034-6)

403. The Marine $\delta^{18}\text{O}$ Record Overestimates Continental Ice Volume During Marine Isotope Stage 3

<https://doi.org/10.1016/j.gloplacha.2022.103814>

404. The marine $\delta^{18}\text{O}$ record overestimates continental ice volume during Marine Isotope Stage 3

<https://www.sciencedirect.com/science/article/pii/S0921818122000819>

405. Themes: Quaternary

<https://gsi.ie/programmes-projects/geoheritage/geoheritage-activities/county-geological-heritage-audits/themes/>

406. The Mesolithic in Ireland: when was it?

<https://www.heritagecouncil.ie/content/files/Our-Ancient-Landscapes-Hunter-Gatherers-in-Ireland.pdf>

407. The nature of MIS 3 stadial–interstadial transitions in Europe: New insights from model–data comparisons

<https://doi.org/10.1016/j.quascirev.2011.08.002>

408. The Prehistory of Britain and Ireland

https://assets.cambridge.org/97805218/48114/excerpt/9780521848114_excerpt.htm

409. The problem of a late quaternary landbridge between Britain and Ireland

<https://www.sciencedirect.com/science/article/pii/0277379185900289>

410. 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)

411. The Quaternary of the Irish Midlands

<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-21-300dpi-OCR.pdf>

412. The Recession of the Last Ice-Sheets

<https://www.cambridge.org/core/books/abs/irish-stone-age/recession-of-the-last-icesheets/F1818A22093D390369DCA9E49F28BDB6>

413. The role of ocean and atmospheric dynamics in the marine-based collapse of the last Eurasian Ice Sheet

<https://www.nature.com/articles/s43247-022-00447-0>

414. The Role of Ocean and Atmospheric Dynamics in the Marine-Based Collapse of the Last Eurasian Ice Sheet

<https://doi.org/10.1038/s43247-022-00447-0>

415. The Southern North Sea and the Human Occupation of Northwest Europe After the Last Glacial Maximum

<https://www.cambridge.org/core/journals/netherlands-journal-of-geosciences/article/southern-north-sea-and-the-human-occupation-of-northwest-europe-after-the-last-glacial-maximum/8109FD0F7130B5E793A23BACE5C32204>

416. The Southern North Sea and the Human Occupation of Northwest Europe After the Last Glacial Maximum

<https://doi.org/10.1017/njg.2014.2>

417. 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>

418. The Timing and Magnitude of the British–Irish Ice Sheet Between Marine Isotope Stages 5d and 2

<https://doi.org/10.1002/jqs.3611>

419. The timing and magnitude of the British–Irish Ice Sheet between Marine Isotope Stages 5d and 2

<https://onlinelibrary.wiley.com/doi/10.1002/jqs.3611>

420. The Wonder Cabinet

<https://cms.museum.ie/en-IE/Museums/Natural-History/Engage-And-Learn/Museum-at-Home/The-Wonder-Cabinet>

421. 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>

422. 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/>

423. Timing and pace of ice-sheet withdrawal across the marine–terrestrial transition west of Ireland during the last glaciation

<https://research.bangor.ac.uk/en/publications/timing-and-pace-of-ice-sheet-withdrawal-across-the-marine-terrest/>

424. 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>

425. 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>

426. Timing and Pace of Ice-sheet Withdrawal Across the Marine–Terrestrial Transition West of Ireland During the Last Glaciation

<https://onlinelibrary.wiley.com/doi/full/10.1002/jqs.3295>

427. Trimlines, blockfields and the vertical extent of the last ice sheet in southern Ireland

<https://onlinelibrary.wiley.com/doi/10.1111/bor.12109>

428. Trimlines, blockfields and the vertical extent of the last ice sheet in southern Ireland

<https://research-repository.st-andrews.ac.uk/handle/10023/6021>

429. Trimlines, Blockfields and the Vertical Extent of the Last Ice Sheet in Southern Ireland

<https://doi.org/10.1111/bor.12109>

430. Trimlines, blockfields and the vertical extent of the last ice sheet in southern Ireland

https://research-repository.st-andrews.ac.uk/bitstream/10023/6021/1/ballantyne2015boreas_earlyview.pdf

431. Understanding Irish Landscape Evolution: Pollen Assemblages from Neogene and Pleistocene Palaeosurfaces in Western Ireland

https://www.researchgate.net/publication/237448209_Understanding_Irish_landscape_evolution_Pollen_assemblages_from_Neogene_and_Pleistocene_palaeosurfaces_in_western_Ireland

432. Using novel methods to track British and Irish Ice Sheet dynamics since the Late Pleistocene, along the west Porcupine Bank, NE Atlantic

<https://www.sciencedirect.com/science/article/pii/S0277379122000944>

433. 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>

434. Visual stratigraphy of the North Greenland Ice Core Project (NorthGRIP) ice core during the last glacial period

<https://doi.org/10.1029/2004JD005134>

435. What Was on the Menu in Prehistoric Ireland?

<https://www.rte.ie/brainstorm/2025/0815/1475736-prehistoric-ireland-food-mesolithic-iron-age-bronze-age/>

436. 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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