

Emerald Gazette

Frozen Earth

31200–31101 BCE

Issue 009 of 340

Compiled & Edited by Gerard J. Hannan BA MBS MA



**Emerald Gazette
Frozen Earth
31200–31101 BCE
Issue 009 of 340**

Compiled & Edited by Gerard J. Hannan BA MBS MA

Gerard J. Hannan BA MBS MA

Copyright © Gerard J. Hannan. All rights reserved.

First Edition

Published 2026

Emerald Gazette

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

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

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

Contents

31200 BCE	3401	31161 BCE	3554
31199 BCE	3405	31160 BCE	3558
31198 BCE	3409	31159 BCE	3562
31197 BCE	3413	31158 BCE	3565
31196 BCE	3417	31157 BCE	3569
31195 BCE	3421	31156 BCE	3573
31194 BCE	3425	31155 BCE	3576
31193 BCE	3428	31154 BCE	3580
31192 BCE	3432	31153 BCE	3584
31191 BCE	3436	31152 BCE	3588
31190 BCE	3440	31151 BCE	3592
31189 BCE	3444	31150 BCE	3596
31188 BCE	3448	31149 BCE	3600
31187 BCE	3452	31148 BCE	3604
31186 BCE	3455	31147 BCE	3608
31185 BCE	3459	31146 BCE	3612
31184 BCE	3463	31145 BCE	3616
31183 BCE	3467	31144 BCE	3620
31182 BCE	3471	31143 BCE	3624
31181 BCE	3475	31142 BCE	3627
31180 BCE	3479	31141 BCE	3630
31179 BCE	3483	31140 BCE	3634
31178 BCE	3487	31139 BCE	3638
31177 BCE	3491	31138 BCE	3642
31176 BCE	3495	31137 BCE	3646
31175 BCE	3499	31136 BCE	3650
31174 BCE	3503	31135 BCE	3654
31173 BCE	3507	31134 BCE	3658
31172 BCE	3511	31133 BCE	3662
31171 BCE	3515	31132 BCE	3666
31170 BCE	3519	31131 BCE	3670
31169 BCE	3523	31130 BCE	3673
31168 BCE	3527	31129 BCE	3677
31167 BCE	3530	31128 BCE	3681
31166 BCE	3534	31127 BCE	3685
31165 BCE	3538	31126 BCE	3689
31164 BCE	3542	31125 BCE	3693
31163 BCE	3546	31124 BCE	3697
31162 BCE	3550	31123 BCE	3700

31122 BCE	3704
31121 BCE	3708
31120 BCE	3712
31119 BCE	3716
31118 BCE	3720
31117 BCE	3724
31116 BCE	3728
31115 BCE	3732
31114 BCE	3736
31113 BCE	3740
31112 BCE	3744
31111 BCE	3748
31110 BCE	3752
31109 BCE	3755
31108 BCE	3759
31107 BCE	3763
31106 BCE	3767
31105 BCE	3771
31104 BCE	3775
31103 BCE	3779
31102 BCE	3783
31101 BCE	3787

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.

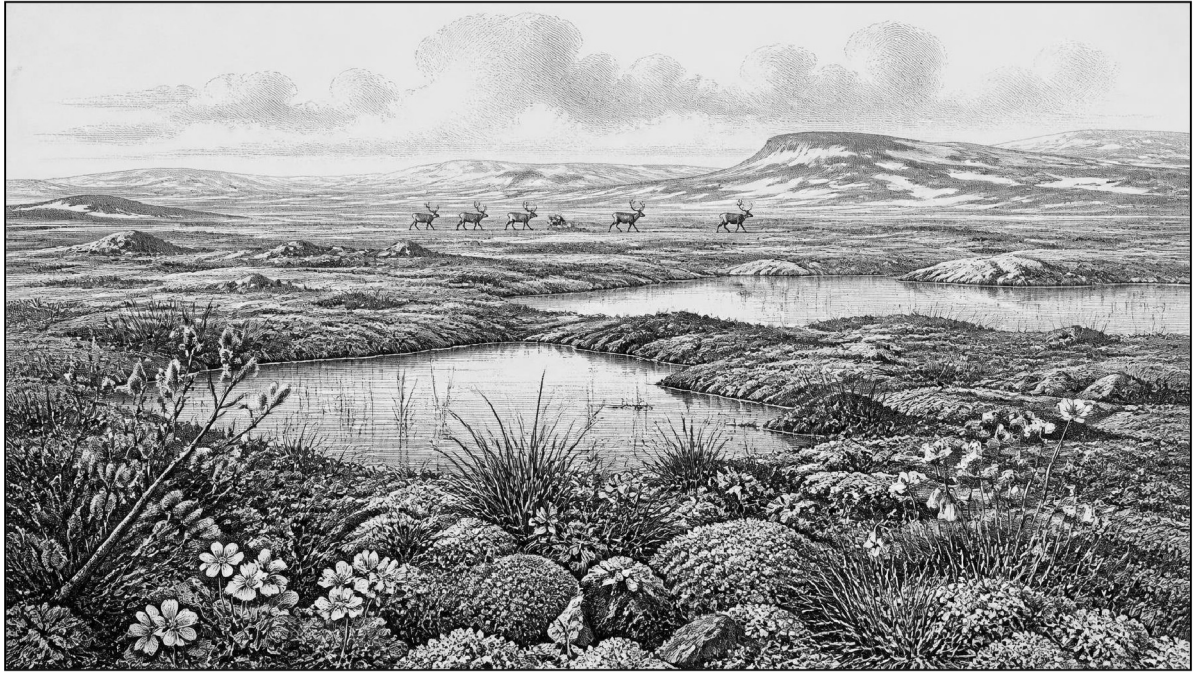
Every issue should therefore be understood both as an individual publication and as another chapter in a much larger project. Read separately, each volume offers a portrait of a particular historical period. Read together, the complete collection becomes an extended chronological journey through the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

31200 BCE

Derryvree Beneath the Drumlin^[1]



The label 31,200 BCE is useful only as a modern signpost. Ireland cannot be recovered year by year at this depth of time: there are no written records, named communities, annual environmental archives or securely dated settlements capable of fixing events to a single calendar year. In archaeological terms, the date falls about 33,150 years before AD 1950, within the later part of Marine Isotope Stage 3, an unstable interval of the last Ice Age. The responsible history is therefore one of ranges, deposits and probabilities rather than an event list.

The most informative Irish evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 exposed organic freshwater silts and fine sands sealed between two thick tills in a drumlin. Their radiocarbon determination, BIRM-166, was 30,500 +1,170/-1,030 radiocarbon years BP. Later published calibration places the deposit broadly between about 36,900 and 31,700 calibrated years BP. A date around 31,200 BCE lies within that wide interval, but cannot be isolated within it. Derryvree is thus not a snapshot of one year; it is a rare surviving record of a cold, ice-free phase in northern Ireland before later ice overran and buried the landscape.

A Land Between Ice Advances

The Derryvree sediments matter because their position is as important as their contents. They lie between older and younger glacial deposits. This proves that, at some point during their formation, open water, wet ground, vegetation and animal life existed where a drumlin was later built into the glacial landscape. The deposit does not show an untouched countryside. It records a landscape already shaped by cold climates and vulnerable to renewed glaciation.

At this time Ireland was not yet uniformly entombed beneath the great British–Irish Ice Sheet of the Last Glacial Maximum. Modern reconstructions show major ice-sheet growth and changing margins over a long period rather than a single simple advance. Derryvree and other pre-maximum evidence indicate that parts of Ireland remained ice-free during the earlier stages of that growth. By the later maximum, generally placed around 27,000 to 23,000 years BP in different sectors, ice covered much of the island and extended across adjacent shelves. The country represented by Derryvree was therefore a precarious interval: not a warm refuge, but a biologically active landscape before more extensive ice transformed it.

That distinction is important. “Ice Age” does not mean every part of Ireland was permanently covered by glacier ice. Conditions could change sharply over centuries or millennia, with cold episodes, less severe interstadials, shifting snowfields and expanding ice margins. Speleothems in Crag Cave, County Kerry, provide an independent indication that milder phases during Marine Isotope Stage 3 could permit liquid water to circulate underground and calcite to grow. Such cave records do not describe Derryvree directly, but they support the wider conclusion that Irish climates at this time fluctuated greatly.

Wet Tundra, Not Woodland

The Derryvree evidence points to open tundra and muskeg rather than forest. Pollen was poorly preserved, yet it was dominated by herbaceous types. Plant macrofossils included cold-adapted mosses, while the broader assemblage has been interpreted as sedge-rich wet ground with pools, aquatic plants and sparse vegetation on drier patches. Fossils of bogbean and water-milfoil indicate freshwater habitats; dwarf willow, mountain-avens, juniper and other herbs belong to an exposed, treeless setting. Insects reinforce the picture of mossy, plant-rich wetland with open water.

This was not necessarily a featureless white wasteland. In the short growing season, wet hollows and pool margins could have been locally productive, supporting mosses, sedges and flowering tundra plants. Yet the overall climate was severe: winters were long and cold, ground conditions were affected by frost, and trees were absent or exceptionally scarce. The landscape was patchy, low-growing and open to wind. A traveller standing on a drier rise would have seen little that resembled later Irish woods, fields or bogs.

Regional variation mattered. Derryvree is a local archive in Fermanagh, not a map of the entire island. Its freshwater basin tells us most securely about its own catchment. Nonetheless, the sediment’s survival beneath later till demonstrates that portions of northern Ireland had open terrestrial and freshwater environments during this broad period. The same caution applies to southern Irish caves: they illuminate animal presence and cave processes, but not a continuous island-wide landscape.

Castlepook’s Animal Record

Castlepook Cave, also called Mammoth Cave, near Doneraile in County Cork is the chief southern counterpart to Derryvree. Excavations in the early twentieth century recovered more than 2,000 bones, making it Ireland’s richest cave assemblage for vertebrate life before the Last Glacial Maximum. Its dated animal remains span a very long period, roughly 45,700 to 19,950 years BP. They must not all be treated as contemporaries of 31,200 BCE, but they show that Ice Age Ireland at different points supported a striking fauna: woolly mammoth, giant deer, reindeer, brown bear and spotted hyena, with Arctic fox, wolf and lemmings appearing among later cold-stage material.

For the date in question, reindeer are especially relevant. Their presence is consistent with open, cold country in which grazing and browsing animals could move across extensive treeless ground. Mammoths and giant deer belong to the same broad Pleistocene world, but a cave assemblage is not a census of

animals standing together on a single day. Caves collect remains through many processes: carnivores drag in carcass parts, animals die or shelter within them, water redistributes bones, and earlier excavations can disturb layers. Spotted hyena at Castlepook is particularly significant because hyenas could accumulate and modify bones. The cave is evidence for an ecological network, not a ready-made scene of harmonious cohabitation.

The revised radiocarbon work on Castlepook has also changed the chronology. Improved bone pretreatment produced dates substantially older than some results obtained in the 1990s, and suggests that species such as giant deer and spotted hyena may have disappeared locally before the Last Glacial Maximum. The lesson is methodological as well as historical: dates and identifications are not fixed forever. Old collections, especially those excavated before modern stratigraphic standards, can yield new knowledge but require rigorous re-examination.

The Human Question

There is no securely excavated camp, hearth, dwelling, tool assemblage or human burial in Ireland that can responsibly be assigned to 31,200 BCE. Consequently, there is no basis for describing a settled population, a language, a leader, political territory, conflict, alliance, religion or formal learning. Nor is there evidence for farming, domestic animals, fields, villages, long-distance commercial exchange or seafaring communities on the island at this point.

One find nevertheless makes this period unusually important. A reindeer femur from Castlepook, held in the National Museum of Ireland's natural-history collections, was reported in 2021 as bearing a deep mark interpreted as the result of processing with a stone tool. The bone was publicised as being about 33,000 years old. If the mark is confirmed as anthropogenic and genuinely contemporary with the fresh bone, it would indicate that one or more Upper Palaeolithic people handled a reindeer carcass in Ireland far earlier than the formerly accepted human record.

That is a consequential but limited interpretation. A marked bone would not prove permanent occupation, a camp at Castlepook, or the killing of the animal at the cave. It might reflect a short visit, scavenging or butchery elsewhere followed by transport or redeposition. The cave's complex excavation history and the known role of water and carnivores make caution essential. Recent archaeological work has sought surviving deposits in the cave, but it has not transformed the old assemblage into a securely stratified Upper Palaeolithic settlement. The strongest statement remains conditional: early human activity in Ireland around this broad period is possible and potentially evidenced by one remarkable object, but it is not yet documented as a community.

No Politics, but a Changing World

Political history cannot be written for this Ireland. There were no Irish kingdoms, borders, treaties or institutions to observe, and it would be misleading to project later social categories onto a glacial landscape. If people did visit, their social world would have been that of mobile Upper Palaeolithic hunter-gatherers known elsewhere in north-west Europe: small groups reliant on knowledge of animals, seasons, stone and shelter. This is a comparison, not direct evidence from Ireland. No Irish artefact assemblage permits a reconstruction of clothing, kinship, ritual or technology for 31,200 BCE.

The most important development was environmental. A cold wetland-and-tundra mosaic existed in places within Ireland during a window before expanding ice reshaped the island. Freshwater sediments at Derryvree preserve that fact; Castlepook preserves evidence of the larger mammals and carnivores that

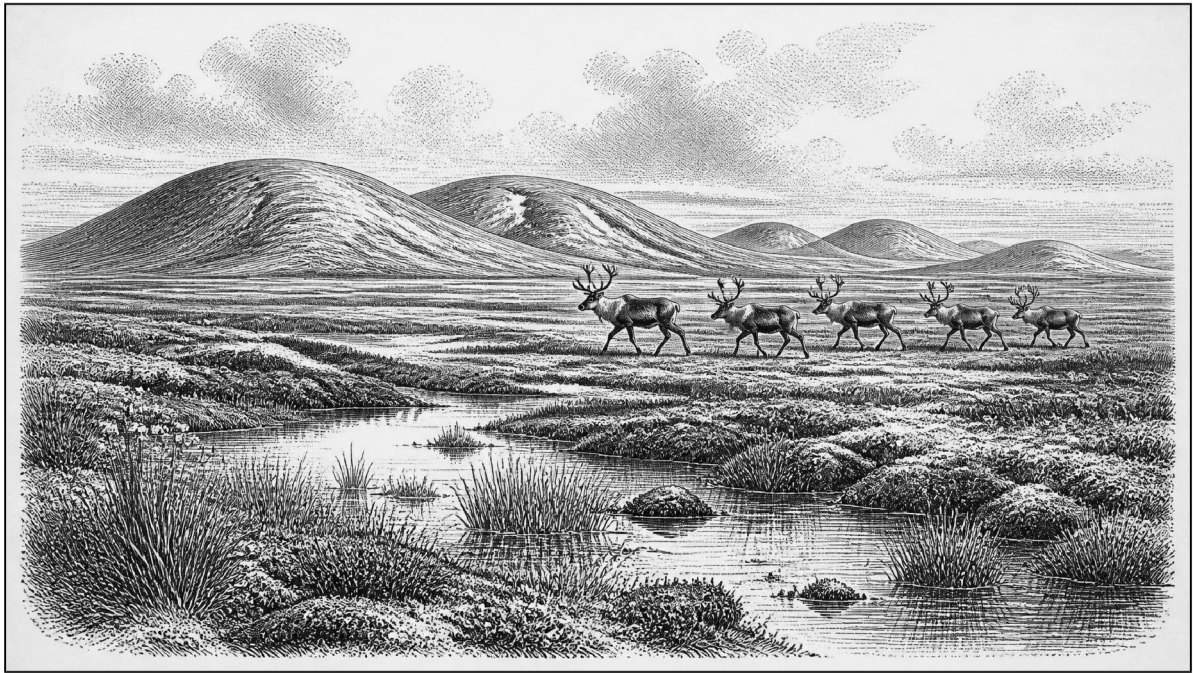
used Irish landscapes over a broad span of the Ice Age. Together they replace the older image of a uniformly empty, frozen island with a more exact one: an intermittently habitable, ecologically varied land whose evidence is sparse, local and often buried beneath the work of later glaciers.

For 31,200 BCE, therefore, the honest history of Ireland is one of uncertainty disciplined by evidence. The year itself cannot be singled out. But the calibrated Derryvree interval, the cave fauna of County Cork, and the approaching growth of the British–Irish Ice Sheet allow a defensible reconstruction of the wider world: open cold country, shallow freshwater, tundra plants, grazing animals and predators, with the tantalising but unproven possibility that people briefly entered that world too.

Chapter 002 of 100

31199 BCE

Derryvree's Periglacial Record ^[2]



A date labelled 31,199 BCE offers a useful point on a modern timeline, but it must not be mistaken for an anniversary in the prehistoric Irish past. No people in Ireland then used calendars, writing, named years or political records; nor can archaeology identify an event that happened in one particular modern calendar year. In radiocarbon terms, the label falls roughly 33,148 years before the 1950 ‘present’ used by laboratories. The responsible evidence is broader and less exact: it concerns environmental and faunal records dating to parts of Marine Isotope Stage 3, the long, unstable cold phase before the Last Glacial Maximum.

The closest important Irish environmental archive is Derryvree, near Maguiresbridge in County Fermanagh. There, a road cutting through a drumlin exposed organic freshwater silts and fine sands trapped between two distinct sheets of glacial till. The organic bed produced a conventional radiocarbon determination of 30,500 radiocarbon years BP, with a large uncertainty. Modern calibration places it broadly around 35,900 calibrated years BP, again with substantial margins. That range does not permit a claim that Derryvree describes conditions in 31,199 BCE precisely. It does, however, provide the best grounded picture of an Irish landscape in the wider middle-to-late part of the last glacial cycle to which this notional year belongs.

A Country Between Ice Advances

Derryvree's position between tills is crucial. A till is debris deposited by glacier ice: an unsorted mixture of clay, stones and larger fragments. The lower till shows that ice had already crossed the district; the upper till shows that a later advance covered and sealed the freshwater deposits. For a time between

those glacial episodes, this part of Fermanagh was not beneath an ice sheet. It was cold, exposed and shaped by periglacial processes—repeated freezing and thawing in ground close to, or seasonally below, freezing.

That does not mean Ireland was uniformly ice-free. The extent, thickness and timing of Irish ice during Marine Isotope Stage 3 remain subjects of active research. Offshore evidence indicates that the British–Irish Ice Sheet was smaller and more variable before its later, major expansion, while local ice masses and shifting margins may have affected different regions at different times. The great ice-sheet maximum came later, mainly after about 26,000 years ago. Around the period relevant here, Ireland should therefore be envisaged not as a single frozen block, but as a geographically varied north-western peninsula or island margin, vulnerable to abrupt climatic swings and encroaching ice.

Lower sea levels altered the map. Much water was locked in global ice sheets, exposing broad shelves around north-west Europe. Ireland's exact connections to Britain and the continent changed with sea level, ice and local topography, but terrestrial animals could evidently reach Ireland during favourable episodes. The presence of large mammals in southern Irish cave deposits is direct evidence of such faunal movement. It is not, by itself, proof of a permanent human population or of easy travel at every moment.

Moss, Sedges and Open Water

The Derryvree organic layers preserve pollen, seeds, mosses and insects rather than houses or tools. Their value lies in combination. The plant remains indicate a treeless landscape: grasses, sedges, herbaceous plants, dwarf shrubs and mosses occupied wet ground around shallow pools. Juniper occurred, but woodland did not. Researchers described the setting as muskeg-like—a waterlogged mosaic of peat-forming vegetation, pools and wet hollows—set within open tundra.

Some of the most striking finds are plant macrofossils, remains large enough to identify beyond pollen grains. They include species now characteristic of cold northern or alpine environments, such as mountain-avens, Arctic clubmoss and bogbean. Aquatic and waterside plants testify to standing or slow-moving fresh water even within a harsh climate. Fossil beetles add another line of evidence: their ecological requirements support an interpretation of cold, open, damp terrain with plant-rich pool margins. This was not a lifeless white desert. It was a seasonally changing wetland-tundra environment, with brief productive summers but severe winters.

The evidence also sets limits on imaginative reconstruction. A fossil seed can demonstrate that a plant grew nearby, and an insect assemblage can indicate habitats and temperature conditions; neither can tell us the colour of a particular season, the size of a local herd, or whether people camped beside a named pool. The ancient Derryvree surface was later buried beneath ice-derived sediments and then transformed by thousands of years of landscape change. What survives is a sampled ecological record, not a complete view.

The Southern Cave Evidence

County Cork provides a complementary, though equally complicated, archive. Castlepook Cave near Doneraile yielded a remarkable assemblage of Late Pleistocene animal remains, accumulated in cave passages that were used and disturbed by carnivores, water and earlier excavation. Recorded fauna include reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings

and spotted hyaena. Such animals imply connections with the cold, open habitats of Pleistocene Britain and continental Europe. A spotted-hyaena skull from Castlepook is especially arresting evidence that this now African species once ranged into Ireland during a different climatic world.

Yet the cave must not be read as a single scene. Bones from different episodes may have been moved, mixed or redeposited, and modern redating has shown that several older radiocarbon results underestimated their true age. Recent work suggests that some Castlepook mammals belonged to substantially earlier parts of Marine Isotope Stage 3, perhaps around 40,000 calibrated years ago or more. The assemblage establishes that southern Ireland was accessible to a diverse cold-stage fauna over a long interval; it cannot prove that all listed species lived together in the Doneraile district in 31,199 BCE.

A reindeer femur from Castlepook has been reported as carrying a deep mark made while the bone was fresh and consistent with a sharp stone implement. If that interpretation and its chronological association are accepted, it may be evidence for people butchering or processing reindeer in Ireland around 31,000 BC. It is an important claim, but it remains a single modified bone rather than an excavated settlement. No securely associated lithic assemblage, hearth, dwelling floor, human burial, art or repeated occupation surface has yet been found there. A cautious conclusion is stronger than either dismissal or certainty: people may have visited Ireland in this period, but a resident community has not been demonstrated.

People Beyond the Evidence

For that reason, the normal headings of a historical yearbook have little direct content. There is no evidence for Irish rulers, territories, diplomacy, treaties, warfare, social ranks, temples, formal religion, markets or long-distance trade networks in this notional year. There are no names, languages, place-names or stories recoverable from the period. To supply them would be invention.

Interpretation can nevertheless proceed carefully. Across north-west Europe, Upper Palaeolithic people were mobile hunter-gatherers with sophisticated stone-tool traditions, social knowledge of landscapes and seasonal animal behaviour, and cultural practices that are visible at better-preserved continental and British sites. If people reached Ireland during a temperate interval within the cold stage, they were likely visitors operating in small, flexible groups rather than inhabitants of villages or states. Reindeer would have offered meat, fat, hide, sinew, antler and bone; caves might provide shelter or serve as carnivore dens, but evidence from Castlepook does not establish their human use as camps.

That comparison is an inference, not an Irish fact. Ireland's island-edge position, rapidly changing climate and limited surviving record make it entirely possible that visits were brief, rare or separated by long absences. Later ice expansion probably removed, buried or reworked many open-air traces. Caves have preserved bones better than artefacts, and chance discovery has shaped the archive. The silence of the record is meaningful, but it is not simple proof that no one ever came.

Approaching the Ice Maximum

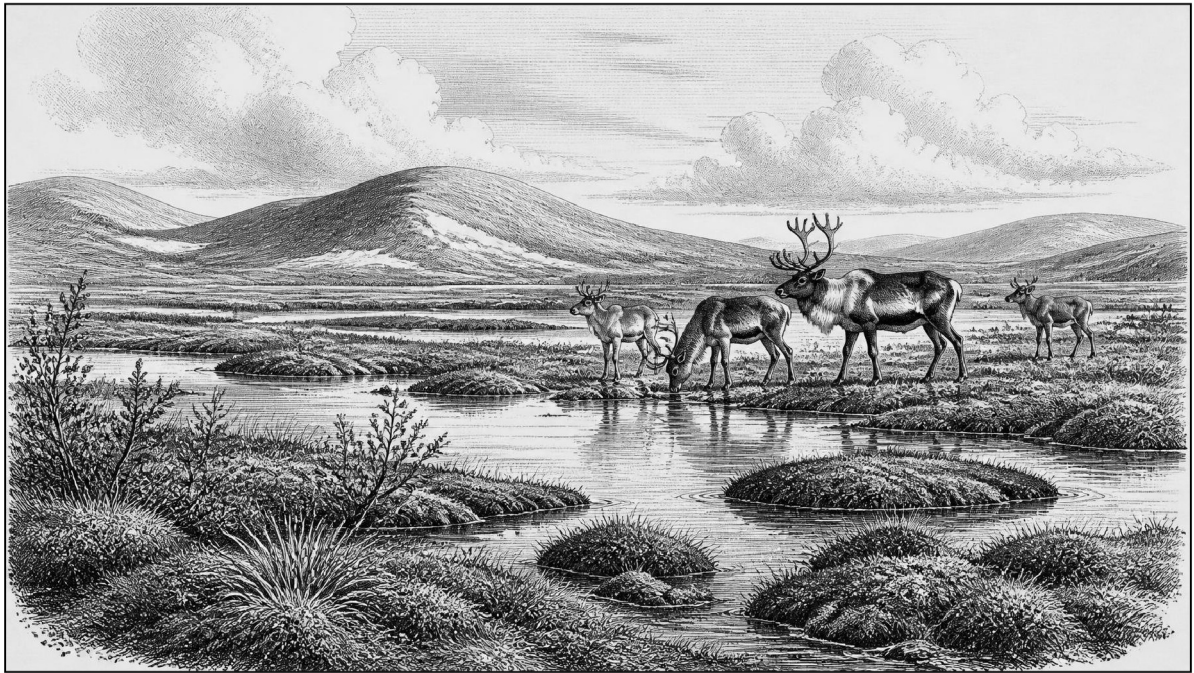
The largest development visible from this distant point is environmental rather than political: the tightening of cold conditions that would culminate in the Last Glacial Maximum. In subsequent millennia, expanding ice transformed Ireland's surface, scouring bedrock, transporting sediment and creating or reshaping many of the landforms that later communities inherited. The Derryvree freshwater bed survived precisely because it was sealed between glacial deposits; its preservation is both a scientific gift and a reminder of the destructive force of later glaciation.

Thus Ireland around the broad timeframe represented by 31,199 BCE was a place of tundra wetlands, shallow waters, sparse vegetation and mobile cold-adapted animals, not yet the familiar green and wooded island of later prehistory. Derryvree provides the clearest local evidence for that world. Castlepook reveals that a wider Pleistocene animal community reached the south, and perhaps that humans did too. Together they illuminate an Irish past without kings or chronicles: one recorded in silt, moss, bone, pollen, beetles and the difficult work of dating them honestly.

Chapter 003 of 100

31198 BCE

BIRM-166's Waterlogged Tundra^[3]



The label *31,198 BCE* offers a useful point of orientation, but it cannot describe a recorded Irish year. No written calendar, settlement sequence or datable human event permits that degree of precision. In archaeological terms it falls roughly 33,147 years before AD 1950, within the Late Pleistocene and broadly Marine Isotope Stage 3, a fluctuating cold phase of the last Ice Age. The responsible evidence is therefore regional and range-based: buried freshwater sediments in County Fermanagh, animal bones from caves in the south, and wider reconstructions of the growing British–Irish Ice Sheet.

The closest securely relevant Irish environmental archive is the Derryvree freshwater series near Maguiresbridge, County Fermanagh. Organic silts and fine sands were found enclosed between two tills, sediments deposited by separate advances of glacier ice. A conventional radiocarbon determination, BIRM-166, gave $30,500 \pm 1,100$ radiocarbon years BP. Modern calibration places it broadly at about 36,900–31,700 calibrated years BP, rather than at one calendar year. The nominal date considered here lies within that wide span. It does not mark the start or end of the deposit, a single season of sedimentation, or an event that can be assigned to a particular generation.

A Landscape Between Ice Advances

Derryvree's position between tills is its essential historical value. It demonstrates a sequence in which ice occupied the locality, retreated or ceased to cover it long enough for freshwater sediment and organic matter to accumulate, and was followed by renewed glaciation. The upper till sealed the earlier wetland, preserving an unusually fragile record of plants, insects and shallow water. This is firm stratigraphic evidence for an ice-free interval at that place. It is not proof that every part of Ireland was ice-free at the same moment, nor a map of the whole island's climate.

Nevertheless, Derryvree belongs to a significant wider picture. Organic deposits beneath later glacial sediments at Greenagho, also in Fermanagh, and marine evidence from the west indicate that the last Irish ice sheet did not simply appear across a uniformly frozen island. Research on the British–Irish Ice Sheet instead points to a prolonged build-up. Around the broad time represented by Derryvree, ice cover in Ireland was probably limited and dynamic, while the large ice sheet that later reshaped the island was still expanding. Its greatest volume belongs much later, around 23,000 years BP. The familiar Irish landscape of drumlins, till plains and glacially scoured rock was consequently not yet in its final form.

At Derryvree, the evidence indicates treeless, periglacial wet ground: a cold freshwater basin with pools, saturated soil and sedge- and moss-rich margins. Finds of plant macrofossils include bogbean, mountain-avens and other taxa compatible with open tundra or tundra-steppe conditions. Such a setting should not be imagined as an unbroken sheet of snow. Even in a severe climate, shallow water, seasonal thaw, sparse herbaceous cover and sheltered hollows created varied microhabitats. The older descriptive term “muskeg” usefully conveys wet organic ground, but it should not conceal this local complexity.

Animals in an Open Country

The Irish cave record supplies a complementary, though more difficult, view. Castlepook Cave near Doneraile in north County Cork has produced remains of reindeer, giant deer, woolly mammoth, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. These animals were not all necessarily present together, and their dated bones span many millennia. Early excavations also disturbed deposits, while water action appears to have re-sorted material in parts of the cave. A cave bone is therefore evidence for an animal and a broad ecological world, not automatically a snapshot of a single local herd or a neatly ordered layer of occupation.

Even with those cautions, the fauna shows that Ireland supported a far richer Late Pleistocene large-mammal community than later historic experience might suggest. Reindeer and lemmings point towards cold open environments; mammoth and giant deer indicate extensive grazing landscapes; hyaenas, wolves and bears reveal a food web with both predators and scavengers. Grass, sedges, herbs and dwarf shrubs, rather than forest, would have formed the basis of much of this ecosystem. The animals could move through a changing north-west European zone in which sea levels were far lower than today and coastlines were differently configured. That does not mean that Ireland was necessarily connected to Britain by dry land at this precise stage, but it does mean that its relationship with surrounding seas and habitats differed radically from the modern island.

Faunal dates require continual reappraisal. Improvements in the pre-treatment of old bone samples have shown that several radiocarbon measurements obtained during the 1990s were too young. Re-dating at Castlepook produced substantially older results for some specimens and strengthened the case that several species occurred in Ireland during Marine Isotope Stage 3, before the Last Glacial Maximum. The revision is an important reminder that scientific dating is not a fixed label attached once and for all to an object: it depends upon surviving collagen, laboratory methods, contamination control and calibration curves.

The Human Question

The most arresting, but least settled, question is whether people were in Ireland around this broad period. A reindeer femur from Castlepook has been publicised as roughly 33,000 years old and as bearing a deep mark interpreted by zooarchaeologist Ruth Carden as damage made by a sharp stone tool during

carcass processing. A County Cork heritage publication uses the broad shorthand “c. 31,000 BC”. If the mark is confirmed as anthropogenic and contemporary with the animal’s death, it would provide evidence for an Upper Palaeolithic person handling reindeer in Ireland far earlier than the better-established terminal-Pleistocene evidence.

That conclusion must remain carefully framed. The bone itself, not a stone-tool assemblage, is the evidence; no securely associated hearth, dwelling, weapon, worked flint or burial has yet been recovered from this date in Ireland. The mark’s cause is an interpretation requiring microscopic and taphonomic assessment, while the cave’s complicated excavation and depositional history limit what can be inferred about its original setting. The bone would not establish a permanent settlement at Castlepook, a population across the island, or a named hunting people. At most, it raises the serious possibility of a brief human presence, perhaps involving mobile hunters with knowledge of reindeer and carcass processing.

The distinction matters because Ireland’s currently secure archaeological narrative is far later. Evidence for human activity becomes clearer near the end of the Pleistocene, including a butchered brown-bear bone from Alice and Gwendoline Cave, County Clare, dated to about 12,810–12,590 calibrated years BP. Substantial evidence for recurring settlement belongs to the Mesolithic, after about 8000 BCE. Thus the Castlepook reindeer is potentially transformative precisely because it is isolated: it may identify an earlier chapter, but it cannot yet supply the detail normally expected of a chapter in human history.

No Politics, No Recorded Beliefs

There is no evidence from this period for Irish political communities, chiefs, diplomacy, warfare, law, institutions or named peoples. Nor can religion, language, art, learning or family organisation be recovered responsibly from the Derrynvree deposits and cave fauna. It would be misleading to fill these silences by importing the social practices of later Mesolithic groups, or by assuming that any possible visitors behaved exactly like better-known Upper Palaeolithic communities in continental Europe.

If people did visit, the basic practical requirements are more safely stated than their social identities. They would have needed acute knowledge of weather, game movement, safe passage, animal anatomy and usable stone. Reindeer could provide meat, fat, hide, sinew and bone, but a cut-marked fragment alone cannot reveal whether a carcass was hunted, scavenged, transported, shared, or processed beside the cave. There is equally no evidence for agriculture, animal husbandry, pottery, metalworking, long-distance commodity trade or permanent built settlement. Economy, in the limited sense that it can be discussed, was the ecology of wild resources and seasonal movement.

A Record of Change, Not a Single Day

For Ireland around 31,198 BCE, the principal development was environmental instability on the approach to a more extensive glaciation. In Fermanagh, freshwater life and open tundra vegetation accumulated in a basin later buried beneath ice-derived sediment. Across the island, caves preserve scattered testimony to mammals adapted to an open, cold and sometimes harsh landscape. The later advance of the British–Irish Ice Sheet would erode, bury and rework many older surfaces, helping to explain why the evidence for both animals and people is fragmentary.

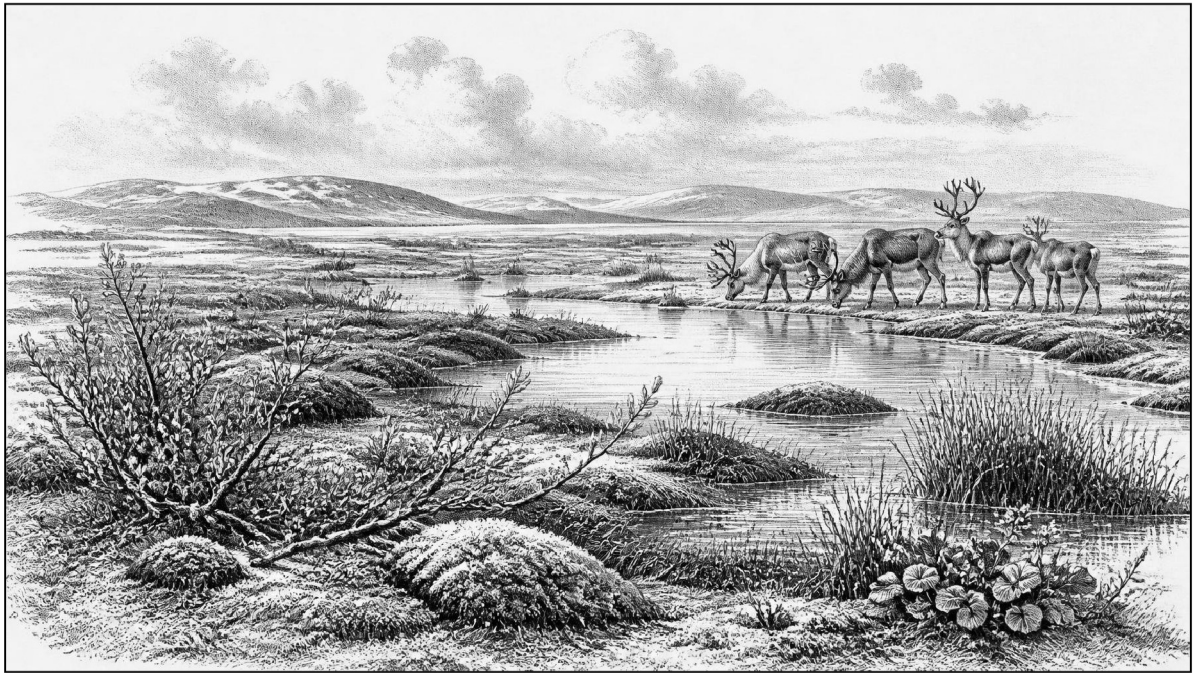
This is therefore not a year of kings, battles or monuments. It is a deep-time interval illuminated by a road-cut wetland deposit, laboratory dating and a handful of cave bones. Derrynvree provides the clearest local evidence: not a frozen void, but a treeless, waterlogged tundra landscape between episodes of ice.

Castlepook offers the tantalising prospect that humans may have entered that wider world. Until tools, securely stratified deposits or further independently assessed bones are found, the most accurate conclusion remains both modest and remarkable: Late Pleistocene Ireland contained habitable pockets, diverse cold-climate fauna, and a possible trace of people long before continuous human settlement can be demonstrated.

Chapter 004 of 100

31197 BCE

Derryvree's Bogbean Pool^[4]



31,197 BCE is not a date that can be matched to an Irish event, ruler, battle or settlement. It is a modern calendar label projected far back into the Late Pleistocene. For a time this remote, calendar-year precision is unavailable: the evidence comes from layers of sediment, fossil plants and animals, glacial landforms, and radiocarbon measurements whose calibrated ranges span centuries or millennia. The most responsible question is therefore not what happened in Ireland in this exact year, but what the archaeological and environmental record can say about the island around 33,100 calibrated years before present.

That broad interval falls within the Midlandian glaciation, Ireland's part of the last glacial cycle, and within Marine Isotope Stage 3. It was before the Last Glacial Maximum, when ice later covered almost all Ireland and much of the surrounding continental shelf. Conditions were cold and unstable, but Ireland was not necessarily a single unbroken ice-cap at every moment or in every region. The island's clearest local archive for this part of the story lies at Derryvree, near Maguiresbridge in County Fermanagh.

A Date Range, Not a Chronicle

Road works in 1969 cut through a drumlin at Derryvree and exposed an extraordinary sequence: freshwater silts and fine sands lay between two thick deposits of glacial till. This arrangement matters. The lower till records an earlier ice advance; the silts show that the site later held standing or slow-moving freshwater in an ice-free local landscape; the upper till shows that glacier ice subsequently returned. It is a sequence of changing environments, not a human habitation layer.

Organic material from the freshwater bed produced the classic determination BIRM-166, 30,500 radiocarbon years before present, with a substantial laboratory uncertainty. Subsequent calibration places its possible calendar age broadly around 36,900–31,700 calibrated years before present. The modern label

31,197 BCE falls near the younger end of that wide range, but it cannot identify a particular season, generation or episode within the deposit. Nor can Derryvree be treated as a weather report for every part of Ireland. Its force lies in showing that this district of south Fermanagh was locally ice-free while the sediments accumulated and that life persisted in a severe periglacial setting.

This distinction is important because the timing and pattern of Irish ice-sheet growth remain subjects of refinement. Some reconstructions infer that major expansion of the Irish sector of the British–Irish Ice Sheet followed during the later part of this interval; others emphasise earlier advances and a highly mobile, fluctuating ice margin. All agree on the larger point: the maximum ice cover belonged later, broadly around 27,000–23,000 calibrated years before present. Around the period represented by 31,197 BCE, the landscape was changing towards that fuller glacial state rather than standing at its eventual maximum.

Cold Water and Open Ground

Derryvree overturns any simple image of an entirely blank, white Ireland. The freshwater silts contained pollen, plant macrofossils, mosses and insects. Their combined message is of open, treeless tundra or muskeg-like wetland: a patchwork of frost-affected ground, saturated hollows, shallow pools and low vegetation. Grasses, sedges, herbs and juniper were recorded, while plant fossils include bogbean, dwarf willow, mountain-avens and lesser clubmoss. Mosses and insect remains support the interpretation of waterlogged ground with pools rich in organic matter.

The evidence does not warrant imagining a familiar modern bog, let alone a forest. Pollen was often poorly preserved, and a few grains from trees such as pine or hazel need not prove woodland growing nearby; pollen can travel long distances or be redeposited. The stronger conclusion is negative as well as positive: tall closed woodland was absent locally, while low herbaceous and wetland vegetation endured through short growing seasons and long, harsh winters.

Such environments could be productive in summer despite their severity. Sedges and grasses provided fodder; pools and wet margins sustained aquatic plants, invertebrates and birds; low shrubs offered limited shelter. Yet freezing and thawing, snow cover, seasonal flooding and thin soils constrained everything. The Derryvree record is therefore evidence for an ecological mosaic, not for a uniformly hospitable refuge. A creature moving through it would have encountered resources concentrated in particular places and seasons.

Animals on a Changing Island

Caves, especially Castlepook Cave near Doneraile in north Cork, provide a complementary but different archive. Castlepook is Ireland's richest known repository of vertebrate remains from the period leading up to the Last Glacial Maximum. Its material includes woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Individual bones there date across a long interval, approximately 45,700 to 19,950 years before present. They must not be assembled into one perfectly synchronous scene.

Nevertheless, the fauna establishes that Ireland supported, at differing times, a far more cold-adapted and large-bodied animal community than that of later historic Ireland. Reindeer are especially relevant to a treeless grazing landscape. Mammoths and giant deer evoke open country with extensive forage, while hyaenas, wolves and bears show that large carnivores and scavengers used the island as well. The cave

itself was not a neutral census station: carnivores could drag in carcass parts, animals could die naturally, water could disturb deposits, and early twentieth-century excavation altered their original context. Cave bones reveal presence and possibility more securely than they reveal population sizes or local food webs.

Sea level was lower than today because vast volumes of water were stored in northern ice sheets. Ireland's coastline and its connections to Britain changed accordingly, though the exact routes available to animals and people varied with ice extent, sea level and local topography. It is reasonable to infer intermittent ecological links across the Irish Sea region, since the fauna had to reach the island. It is not responsible to turn that inference into a mapped highway or a claim that Ireland was permanently joined to Britain at this specific point in time.

The Human Question at Castlepook

The possibility of people in Ireland around this era rests on exceptionally slight evidence. A reindeer femur fragment from Castlepook has been reported as radiocarbon dated to roughly 33,000 years ago and as bearing a deep mark interpreted as made by a sharp stone tool during butchery. If that taphonomic interpretation is confirmed, it would be a striking indication that one or more Upper Palaeolithic people processed a reindeer in Ireland before the Last Glacial Maximum.

But the distinction between evidence and interpretation must remain sharp. The date belongs directly to the animal bone, not to a securely excavated occupation surface. Castlepook has not produced a securely associated lithic assemblage, hearth, house floor, burial, human skeleton, cave art or repeated settlement sequence of this age. The National Museum of Ireland continues to describe Palaeolithic human presence in Ireland as unproven, while current fieldwork at Castlepook seeks surviving undisturbed deposits and better dating. The bone is therefore an important claim under investigation, not proof of a resident Irish population in 31,197 BCE.

If people did reach the island, they were almost certainly mobile hunter-gatherers rather than settlers of villages. They would have belonged to the wider Upper Palaeolithic world of north-west Europe, where communities possessed sophisticated knowledge of stone, animal movement, hides, fire and seasonal terrain. None of that broader knowledge permits us to assign language, ethnicity, kin groups, named cultures or a fixed territory to Ireland. A single potentially butchered bone cannot disclose how many visitors came, from where, how long they remained, or whether they returned.

No Politics, No Diplomacy, No Recorded Religion

For this period, political affairs and diplomacy are not merely unknown; they are categories for which the Irish evidence offers no direct basis. There were no states, written agreements, dynasties or boundaries recoverable from the record. If humans were present, social life would have been organised through small, mobile communities and personal relationships, but even that is an inference from comparative Upper Palaeolithic archaeology elsewhere rather than an observed Irish settlement pattern.

The same restraint applies to religion, culture and learning. Ireland has no securely dated ritual site, burial, artwork, musical object or formal tool assemblage from around this time. The natural world may have held social and symbolic meanings for any people who visited it, as animals and places did in other Upper Palaeolithic societies, but no Irish object can demonstrate those meanings. The greatest cultural lesson of the period is methodological: silence in the record is not evidence of an empty landscape, but neither is it a licence to fill the silence with imagined tribes and ceremonies.

What This Moment Represents

Around the broad interval denoted by 31,197 BCE, Ireland was a cold, open and environmentally variable part of the north-west European world. In Fermanagh, freshwater wetlands existed between episodes of glaciation, supporting a resilient flora of low plants, mosses and aquatic species. Across the island, cold-stage mammals had moved through landscapes whose coastlines, ice margins and habitats were in flux. In Cork, Castlepook Cave preserves the material remains of that animal world and a tantalising, but still limited, possible trace of human butchery.

The decisive development was not a historical event but an approaching transformation. Ice sheets would expand and rework much of the island, eroding or burying older surfaces and helping explain why the evidence is so fragmentary. Derryvree survived beneath later till; Castlepook's protected chambers retained bones from many episodes. Together they provide a disciplined glimpse of Ireland before maximum glaciation: not an empty stage, not a known homeland, but a living periglacial landscape whose history is preserved in mud, pollen, seeds, insects and bone.

Chapter 005 of 100

31196 BCE

Crag Cave's Flowstone Record ^[5]



31,196 BCE is a modern chronological label, not a year that can be recovered from Irish evidence. At this depth in time, archaeology and earth science cannot identify a particular season, individual, journey or event. The most responsible approach is to place the date within a broader Late Pleistocene interval: roughly 33,145 years before AD 1950, during Marine Isotope Stage 3, a cold and climatically unstable part of the last Ice Age. The best Irish evidence provides calibrated ranges, environmental sequences and occasional animal remains, not an annal for one calendar year.

A useful local framework is the Derryvree freshwater series near Maguiresbridge, County Fermanagh. Organic silts there yielded a conventional radiocarbon determination of 30,500 $\pm$ 1,170/–1,030 radiocarbon years BP. Modern calibration places that result broadly at about 36,900–31,700 calibrated years BP, or approximately 34,950–29,750 BCE. Thus 31,196 BCE falls inside the range represented by this environmental archive, but it cannot be assigned to an exact layer, pool, animal or human action. Radiocarbon ages measure changing atmospheric carbon rather than directly supplying modern calendar years, and their uncertainties become especially important this far back.

An Ice-Free Fermanagh Wetland

Derryvree was exposed when roadworks in 1969 cut across a drumlin, a hill moulded by glacier ice. Beneath the surface lay two separate layers of till, the unsorted debris deposited by glaciers. Between them were freshwater silts, fine sands and organic material. The sequence establishes a clear relative history: ice had covered the site; an interval followed in which water, plants and insects accumulated in an ice-free landscape; then a later glacier advanced and sealed the deposit beneath a new layer of till. It is a remarkable survival, because later ice often erased or reworked the evidence of earlier landscapes.

The fossils indicate a cold, open and largely treeless tundra or muskeg environment, not a forested Ireland. Pollen was dominated by herbaceous plants; plant remains included mosses and wetland species; and insect evidence points to waterlogged ground with open pools and abundant plant material. Grasses, sedges, herbs and low-growing shrubs could exploit short summers, while damp hollows supported mossy vegetation and shallow freshwater. A few grains of tree pollen do not demonstrate local woodland: they may have travelled long distances or been reworked from older sediments. The secure inference is of a sparse, periglacial wetland mosaic in south Fermanagh.

This was not a timeless frozen waste. Seasonal thaw, standing water and plant growth are all built into the Derryvree record. Yet the climate was severe enough to prevent closed woodland from developing. Frost action, snow cover, short growing seasons and wind exposure would have shaped the terrain. Such country offered patchy but real resources for grazing animals and their predators: forage along wetland margins, sheltered ground, freshwater and routes through open valleys. The landscape was productive in a cold-adapted sense, but it was neither mild nor densely vegetated.

Flowstone and Approaching Ice

Crag Cave near Castleisland, County Kerry, supplies a different kind of evidence. Uranium-series dates on cave flowstone show that speleothems formed in south-west Ireland during parts of the interval around the beginning of Marine Isotope Stage 2. Flowstone needs liquid water percolating through soil and limestone above the cave, so its growth is evidence against local, continuous deep permafrost or overriding ice at that precise cave location while it formed. It does not prove that the whole island was ice-free, nor does it provide an annual weather report. It does, however, reinforce the picture of an Ireland experiencing varied local conditions during a period of major climatic transition.

At the larger scale, Ireland stood close to the expansion of the last British–Irish Ice Sheet. Recent reconstructions trace growth and subsequent retreat of that ice sheet between about 31,000 and 15,000 years ago, while evidence from Derryvree and Greenagho indicates that north-central Ireland had remained ice-free until at least about 34,000 years ago. The date under consideration therefore belongs near a threshold: some Irish landscapes retained water, vegetation and animal life, but renewed glaciation was approaching and would later overwhelm much of the island. It would be wrong to map that changing ice margin too precisely for 31,196 BCE; the evidence supports regional sequences and broad phases, not a single island-wide snapshot.

Castlepook's Animal World

Far to the south, Castlepook Cave near Doneraile in County Cork preserves Ireland's richest known assemblage of pre-Last Glacial Maximum vertebrate remains. Its Ice Age fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, with later cold-stage material including Arctic fox, wolf, collared lemming, Norwegian lemming and mountain hare. These finds demonstrate that Ireland was, at different times in the Late Pleistocene, part of a wider north-west European ecological world in which large herbivores, carnivores and cold-adapted small mammals moved through suitable habitats. They should not be treated as a single herd or community living simultaneously around the cave in 31,196 BCE: cave deposits were accumulated over long periods, were disturbed by water, and include material brought in by carnivores.

Spotted hyaenas are especially important to interpretation. Castlepook was not simply a human site with bones left after meals. Carnivores could drag prey and scavenged limbs into the cave, gnaw bones, leave droppings and mix remains from different episodes. Water could also transport or rearrange sediment. The cave is consequently a powerful record of fauna and taphonomy—the processes by which remains entered, altered and survived at a site—but a difficult place from which to reconstruct a single moment of life. Its unexcavated areas nonetheless retain major potential for carefully controlled future research.

The Reindeer Femur Question

The principal possible human evidence near this period is a reindeer femur from Castlepook, held in the National Museum of Ireland's Natural History collection. It has been presented as dating to about 31,000 BCE and bears a deep mark interpreted by zooarchaeologist Ruth Carden as having been made on fresh bone by a sharp stone tool during carcass processing. If that interpretation is sustained, it would show that a person or small party handled a reindeer in Ireland during the Upper Palaeolithic, greatly extending the island's potential human story beyond the better-established terminal Pleistocene evidence.

The limits are as significant as the possibility. There is no securely associated stone-tool assemblage, hearth, occupation floor, shelter, burial, human bone or repeated butchery area of comparable age. Nor can the femur reveal whether people killed the animal, scavenged it, removed meat or sinew elsewhere, or whether carnivores later took the limb into the cave. The bone is evidence for a possible episode of human activity, not proof of permanent settlement, a population of known size, or a named cultural group. Contemporary Upper Palaeolithic communities elsewhere in Europe show that mobile hunter-gathering was possible in cold environments; they do not fill the Irish evidential gap.

Society Without a Chronicle

Accordingly, there are no identifiable political affairs, rulers, territories, alliances or diplomatic encounters for Ireland at this date. There is no evidence for farms, villages, monuments, formal religion, writing, schools, markets or organised trade within Ireland. Such absences are not proof that every visitor lacked social rules, beliefs or knowledge. If people briefly reached the island, survival would have required practical learning: reading weather, moving across exposed ground, locating water, working hides and bone, maintaining cutting edges, sharing food and communicating routes and risks. But these are cautious inferences from the demands of Ice Age foraging, not recovered facts about a particular Irish group.

Nor should Ireland be imagined as necessarily joined to Britain by a dry, easily crossed land bridge. Sea levels were lower during the Ice Age, but the existence, timing and usefulness of a continuous land connection between Ireland and Britain have long been disputed. For later periods, research has generally rejected a simple, persistent land bridge and instead considers changing coastlines, ice connections, islands and sea crossings. Around 31,196 BCE, any human arrival remains geographically possible but archaeologically untraced; the route, frequency and season are unknown.

What This Date Can Bear

The historical importance of 31,196 BCE lies in the evidence's fragility. Derryvree shows that, within a broad calibrated interval containing this date, part of Ireland supported open, wet, treeless tundra between glacial episodes. Crag Cave records groundwater moving through a south-western karst landscape during the wider transition. Castlepook reveals a fauna adapted to a cold European world and preserves a disputed but consequential sign of possible human carcass processing. Together they describe environmental change, animal movement and a human question—not an eventful year. The clearest Irish story is one of habitats briefly available before renewed ice transformed the country again.

Chapter 006 of 100

31195 BCE

The Castlepook Femur Inquiry^[6]



The label 31,195 BCE is useful only as a modern point of reference. No Irish community recorded years at this depth in time, and archaeology cannot identify an event, individual or season corresponding to it. In radiocarbon convention it falls roughly 33,145 calendar years before AD 1950, within the later part of Marine Isotope Stage 3 (MIS 3), a fluctuating cold phase of the Late Pleistocene. The responsible evidence is therefore regional and range-based: lake and wetland sediments, glacial deposits, animal bones and the difficult archaeology of caves. Together they illuminate an Ireland of tundra-like habitats, mobile animals and changing ice margins, not a country with traceable annual history.

A Landscape Before the Maximum Ice

This was not yet the Last Glacial Maximum, the period when the British–Irish Ice Sheet achieved its greatest overall extent. Nor was Ireland uniformly free of ice. The ice sheet was dynamic and regionally uneven: glaciers advanced, stagnated and retreated in response to shifts in snowfall, temperature, sea level and ocean conditions. Reconstructions indicate rapid growth of ice masses across parts of the British–Irish region after about 31,000 years ago, but they also stress that there was no single moment when every sector reached its maximum. Conditions in Cork, Fermanagh, the Irish Sea basin and the Atlantic shelf could differ sharply.

At this date, modern coastlines, islands and travel routes did not exist in their familiar form. Much seawater was locked in continental ice sheets, lowering global sea level and exposing broad areas of the continental shelf. Ireland's eventual insularity belongs to a much later phase of deglaciation and sea-level change. Yet lower sea level did not automatically make movement easy: routes across the wider Irish Sea

region could still have involved cold water, broken ground, glaciers and dangerous weather. For animals and any people present, Ireland was a marginal north-western extension of a larger European landscape, not the settled island known from later prehistory.

Derryvree's Long Environmental Window

The best Irish environmental evidence broadly relevant to this notional year comes from Derryvree near Maguiresbridge, County Fermanagh. Roadworks in 1969 exposed organic freshwater silts and sands enclosed between two layers of till, the unsorted sediment deposited by glacier ice. This sequence establishes a relative order: an earlier glaciation, an interval in which freshwater and organic material accumulated at the locality, and a later ice advance that sealed the deposit. It does not establish that every part of Ireland was ice-free at once.

Organic material from the Derryvree bed produced a conventional radiocarbon determination of about $30,500 \pm 1,200$ radiocarbon years BP. Calibration converts this into a broad calendar range, commonly expressed as approximately 36,900–31,700 calibrated years BP. The requested year sits within that range, but not at a pinpointed horizon. A calibrated range dates the sampled material and its deposition within limits; it does not date a particular pool, plant, animal movement or human visit to 31,195 BCE.

Even so, the deposit is exceptionally informative. Plant macrofossils, pollen and spores indicate open, treeless vegetation under periglacial conditions. The record includes bogbean (*Menyanthes trifoliata*) and lesser clubmoss (*Selaginella selaginoides*), plants consistent with wet ground and cold, open settings. Sedges, herbs, low shrubs, shallow pools and waterlogged channels probably made up a varied local mosaic. The old description of such ground as muskeg should not invite a picture of a mild peat bog: this was a severe climate with frost, short growing seasons and little shelter from trees. Nevertheless, wetland edges could be biologically productive during favourable months.

This matters because it corrects two opposite misconceptions. Ireland was not a continuously wooded refuge, but it was not necessarily a featureless white desert throughout the whole glacial cycle either. Derryvree preserves evidence for freshwater life and tundra vegetation in a locality later overridden by ice. Such deposits are rare precisely because subsequent glaciation eroded, mixed or buried so much of the earlier landscape.

Reindeer, Carnivores and Cave Evidence

Animal remains from southern Irish caves demonstrate that a richer Pleistocene fauna reached Ireland during parts of MIS 3. Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork, has yielded bones of reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, hare and spotted hyaena. These animals did not necessarily all live together at one time, and a cave collection is not a census of a single valley or year. Cave deposits may accumulate over millennia; bones can be carried in by carnivores, water or people, while nineteenth- and early twentieth-century excavation methods often left incomplete stratigraphic records.

Modern redating has made this caution more important. Improved radiocarbon pretreatment has shown that several Castlepook specimens are substantially older than determinations obtained in the 1990s. The revised evidence places significant elements of the fauna in MIS 3 and suggests that species including giant deer and spotted hyaena may have vanished locally before the Last Glacial Maximum. The result is not a settled chronology of every specimen, but a firmer warning against treating older museum labels or single dates as final.

Reindeer are particularly relevant to the landscape around 31,195 BCE. They could exploit open, cold-country vegetation and would have been part of a food web including large predators and scavengers. Mammoths and giant deer indicate that, at least during suitable intervals, enough grazing and browsing resources existed to sustain very large herbivores. Hyaenas, whose remains and coprolites are known from Castlepook, show that caves could be carnivore dens as well as potential shelters. A bone recovered from a cave may therefore record hunting, scavenging, carnivore transport, natural death or several processes combined.

The Reindeer Femur and the Human Question

One object makes Castlepook unusually important to Irish prehistory: a reindeer femur bearing a deep surface incision, interpreted by zooarchaeologist Ruth Carden as a cut made by a sharp stone tool during carcass processing. Public accounts have associated the bone with roughly 31,000 BC, and it has the potential to move evidence for human activity in Ireland far earlier than the long-accepted terminal-Pleistocene record. If the cutmark interpretation is sustained, it would show that people were capable of reaching Ireland's cold north-western margin and processing animal carcasses during MIS 3.

Its significance should not be overstated. The bone is not a securely excavated camp floor with tools, hearths, shelters and refitting butchered remains. It derives from an old cave collection whose deposits were disturbed by animals, sediment movement and historic excavation. A radiocarbon result dates the death of the reindeer, while identification of a human-made mark is a separate taphonomic judgement. Nor can one marked bone demonstrate permanent occupation, a resident population, a named group or continuous settlement. Recent excavation at Castlepook has sought better contextual evidence, but the inquiry remains open.

The most defensible conclusion is therefore modest but consequential: a reindeer lived in, or reached, north Cork during this broad cold-stage interval; one bone may preserve evidence of human butchery; and the case deserves continued testing. It is more accurate to speak of possible episodic Upper Palaeolithic activity than of an established Irish population. Any visitors may have been highly mobile hunter-gatherers following animal movements and exploiting short-lived opportunities, rather than inhabitants of a village or territory.

Life Without Political History

There is no evidence from which to reconstruct political affairs, diplomacy, warfare, law, religious institutions, language, art or learning in Ireland at this date. No graves, buildings, ornaments, inscriptions, monuments, campsites or stone-tool assemblages securely attributable to 31,195 BCE have been identified. Equally, there is no basis for assigning an ethnic or national identity to any possible visitors. Later Irish traditions, medieval origin stories and modern ideas of nationhood have no evidential reach into MIS 3.

Everyday life can only be discussed conditionally, through wider Upper Palaeolithic comparison. If people processed the Castlepook reindeer, they would have needed portable cutting tools, knowledge of animal anatomy, warm clothing and flexible ways of moving through exposed country. Such inferences describe practical requirements, not finds from a documented Irish camp. A temporary hunting or scavenging episode is plausible; a permanent settlement remains unproven.

Economy and trade must likewise be approached with restraint. There is no evidence for farming, herding, metalworking, pottery, formal exchange networks or maritime commerce in Ireland at this time. The central economy was ecological: plants capturing a brief summer's growth, herbivores converting it into meat and movement, and predators or scavengers following them. For hypothetical human parties, animal resources may have supplied food, hide, sinew, bone and antler. Whether carcasses were hunted, found or contested with carnivores at Castlepook cannot yet be demonstrated.

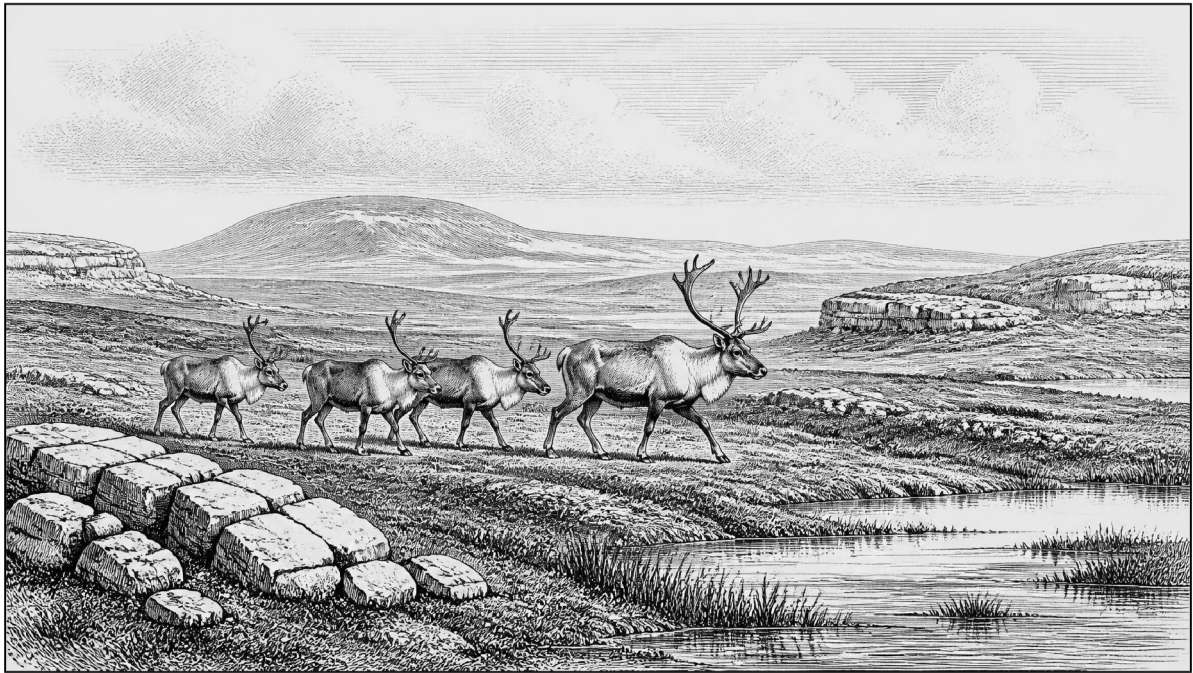
A Record of Possibility

Ireland around 31,195 BCE is best understood through the tension between rich natural evidence and sparse human traces. Derryvree records an ice-free freshwater and tundra environment during a broad interval that includes this date. Castlepook confirms a cold-adapted fauna in the south and raises a serious, though unresolved, possibility of human carcass processing. Beyond those points, certainty falls away. The historical importance of the period lies not in invented chiefs or battles, but in the emergence of evidence that Ireland, long thought archaeologically empty before the end of the Ice Age, may have been visited at its glacial edge far earlier than once believed.

Chapter 007 of 100

31194 BCE

A Reindeer at Doneraile^[7]



The label *31,194 BCE* cannot identify a recorded Irish year, an event, a ruler or a date in anybody's calendar. There were no written records, fixed local calendars or named communities from which an annual history can be made. It is a modern chronological marker, roughly 33,000 years before the conventional radiocarbon reference date of AD 1950. For Ireland at this depth of time, responsible dating is expressed through radiocarbon determinations, calibrated ranges and broad climatic phases, often carrying uncertainties of centuries or more. The most appropriate setting is the later part of Marine Isotope Stage 3, within the Midlandian cold stage of Irish Quaternary history and well before the Last Glacial Maximum.

A Landscape Before Maximum Ice

Ireland was not yet the universally ice-covered land of the glacial maximum, which came much later, broadly between about 27,000 and 21,000 years ago in the wider British–Irish Ice Sheet system. Its climate nevertheless was severe, unstable and unlike that of modern Ireland. Long-term shifts between colder and relatively milder episodes affected glacier growth, vegetation, watercourses and animal movements. It is misleading to picture a single, unchanging 'Ice Age' scene, still less to assume that every part of the island experienced identical conditions at the same moment.

The closest informative environmental sequence is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 exposed freshwater silts and fine sands trapped between deposits of glacial till. Organic material from this sequence produced a conventional radiocarbon date of $30,500 \pm 1,170/1,030$ BP. That measurement is not an annual date and cannot simply be converted into a precise BCE year. It does, however, place the deposit broadly within the Middle Midlandian, the same large climatic interval relevant to the date under consideration.

Derryvree preserves a rare Irish glimpse of a cold, ice-free or ice-marginal landscape. Pollen, seeds, mosses and insect remains point to open tundra or tundra-steppe conditions, with very limited tree cover. Sedges, grasses, mosses, dwarf willow, Arctic-alpine plants and wet-ground species grew where local moisture, soil and the short summer allowed. Shallow pools and waterlogged hollows interrupted more exposed ground. The landscape has often been compared to muskeg: cold, wet, peaty terrain in which vegetation, standing water and frost acted together. This was not a blanket of permanent snow, but neither was it the green, wooded island familiar today.

Animals in a Cold Mosaic

The animal record gives the period its strongest sense of life. Cave deposits, particularly in southern Ireland, have produced remains of large mammals associated with late Pleistocene open-country environments. Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork has yielded woolly mammoth, reindeer, giant deer, brown bear, hare, fox, lemming and spotted hyaena among its rich but complicated faunal archive. These animals were not necessarily contemporaries in one single episode: cave collections formed over long spans and were often excavated before modern stratigraphic methods were available. Their presence nevertheless demonstrates that Ireland could support, at different points in the wider period, a varied cold-climate fauna.

Reindeer were especially well suited to an open, seasonal country. They could exploit lichens, sedges and other tundra resources, and their movements may have followed changing forage and snow conditions. Giant deer and mammoth suggest broad feeding grounds rather than dense forest. Predators and scavengers, including hyaenas, indicate a more complex food web than the phrase ‘frozen wilderness’ implies. Yet cave bones do not provide a census of a national fauna. Carcasses may have been dragged in by carnivores, washed into chambers or accumulated through natural deaths as well as human action.

The Castlepook Question

A fragment of reindeer femur from Castlepook is the most consequential object for any discussion of people in Ireland around this remote date. It was recovered during early twentieth-century cave work and has been reported as roughly 33,000 years old. A prominent deep mark on the bone has been interpreted by zooarchaeologist Ruth Carden as damage made by a sharp stone implement while the bone was fresh: potentially evidence of carcass processing by a human visitor. County Cork heritage material has therefore presented the specimen, cautiously, as a possible indication of Stone Age hunters in the Doneraile district around 31,000 BCE.

The distinction between the evidence and its interpretation is essential. The dated bone establishes the age of the reindeer, within the limits of its laboratory result and calibration; it does not independently date the surface mark, identify its maker or prove where the animal was killed. Nor was the femur recovered in a modern excavation alongside a securely associated tool assemblage, hearth, built shelter or undisturbed floor. Stone-tool cuts must be distinguished from carnivore damage, trampling, sediment abrasion, weathering, breakage and marks introduced during excavation or handling. The proposed human modification is important and plausible enough to warrant serious investigation, but it is not equivalent to proof of a permanent Irish settlement.

If the mark is confirmed as anthropogenic, the most economical interpretation is a brief Upper Palaeolithic incursion: one or a small number of highly mobile hunter-gatherers encountered and processed a reindeer somewhere in the wider landscape. They may have reached Ireland by sea, or across

a shorter sea crossing than exists today when global sea level was lower. It would still not follow that they lived continuously on the island, that Castlepook was a camp, or that their descendants remained. Ireland's position beyond the Irish Sea made access a substantial practical matter even in low-sea-level times.

Society Without a Settlement Record

No political affairs, chiefs, alliances, wars or diplomacy can responsibly be assigned to Ireland in this period. There is no evidence for states, territories, formal institutions or named peoples. Likewise, no Irish shrine, burial, artwork, spoken language or learning tradition can be identified for around 31,194 BCE. The absence is not proof that visiting people had no beliefs, stories, social rules or knowledge; Upper Palaeolithic communities elsewhere in Europe possessed sophisticated stone-working traditions, social networks and symbolic practices. It means only that none of these can presently be demonstrated in Ireland for this date.

Nor can an Irish economy or trade network be reconstructed. A putative hunting visit would imply practical knowledge of animals, seasons, clothing, fire, cutting tools and safe movement through difficult terrain, but these are inferences from the wider Upper Palaeolithic world, not discoveries from a securely excavated Irish camp. There is no direct evidence here for houses, boats, stored food, exchange goods or recurring seasonal rendezvous. The lone reindeer bone, if humanly modified, would illuminate subsistence in the narrowest possible sense: meat and perhaps marrow or hide were valuable resources.

Fragmentary Ireland

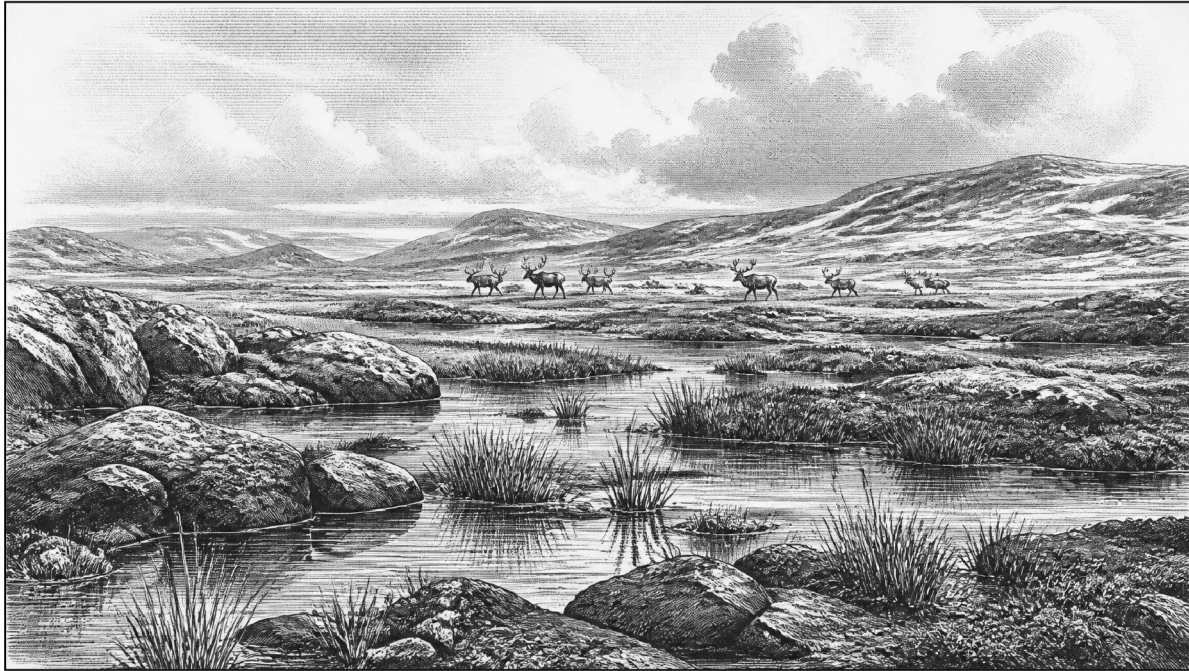
The scarcity of evidence is itself historically meaningful. Later ice advances, erosion, rising seas and the disturbance of cave deposits removed or obscured much of the archaeological record. Sites that once stood on coastal plains may now lie beneath the sea, while glacial action could destroy shallow camps and redeposit sediments. The contrast with continental Europe is striking: people of broadly comparable age left stone tools, living surfaces, ornaments and art in many regions, whereas Ireland offers only scattered environmental archives and a disputed or provisional human trace.

Thus the most accurate portrait of Ireland around 31,194 BCE is not one of a known community but of possibility constrained by evidence. Cold open ground, wetlands and freshwater pools supported hardy vegetation and substantial grazing animals. Cave systems such as Castlepook accumulated bones that now reveal a changing Ice Age ecosystem. A marked reindeer femur raises the prospect that people briefly entered that world. It does not yet allow a conventional national history. The real historical development is the emerging recognition that Ireland's human story may reach further back into the Upper Palaeolithic than older accounts allowed, while remaining precarious, episodic and unresolved.

Chapter 008 of 100

31193 BCE

Mammoths Above the Awbeg^[8]



31,193 BCE is not a date from which Ireland has an annual history. No Irish calendar, written record, named person or recoverable political event can be assigned to this particular year. The label is a modern way of locating a point roughly 33,140 years before the conventional radiocarbon reference year of AD 1950; it is not itself a radiocarbon determination. At this depth of time, evidence comes in broad, calibrated ranges and from deposits accumulated over generations or millennia. The responsible subject is therefore Ireland during the later part of Marine Isotope Stage 3, within the last Ice Age, rather than an invented episode in a precisely known year.

A Landscape Before Maximum Ice

In broad terms, 31,193 BCE falls before the fullest expansion of the last Irish Ice Sheet. The global Last Glacial Maximum is generally placed much later, around 26,500–19,000 years ago. That distinction matters. Ireland was not simply an island uniformly buried beneath ice at this date, nor was it a familiar green and wooded landscape. Its climate and ice cover were changing sharply over comparatively short geological intervals, and conditions differed between regions. The island lay within the shifting climatic frontier of the north-east Atlantic, affected by changing sea levels, sea ice, atmospheric circulation and the advance or retreat of glaciers.

Evidence from beneath later glacial deposits demonstrates that parts of Ireland were ice-free during portions of this wider period. At Derryvree near Maguiresbridge in County Fermanagh, freshwater silts and organic material lay between two tills: sediments deposited by ice before and after the wetland episode. A conventional radiocarbon determination of $30,500 \pm 1,100$ BP has been calibrated to a wide

range of about 36,900–31,700 cal BP. It cannot be converted into a precise date for a single pond, plant or animal, but it establishes that a cold, non-glacial landscape existed in this part of the north during a span relevant to the early thirty-third millennium before present.

The Derryvree evidence points to treeless, waterlogged tundra or muskeg-like ground, with freshwater pools, sedges, mosses and herbs. It does not yield a panoramic map of Ireland, but it strongly cautions against imagining dense woodland. Other sequences, including Greenagho in Fermanagh and Aghnadarragh beside Lough Neagh in County Antrim, likewise preserve rare windows onto the fluctuating Midlandian cold stage. Pollen, plant remains and fossil insects indicate open vegetation and severe seasonality. Some beetles associated with these records now live far to the north in Scandinavia. The exact temperatures and seasons of 31,193 BCE cannot be recovered, but the available evidence supports an exposed, cold environment with wetlands and sparse plant cover rather than a settled agricultural landscape.

Fauna at the Edge of Ice

The most vivid Irish evidence comes from cave deposits, particularly Castlepook Cave—also called Mammoth Cave—near Doneraile in north County Cork. The cave was excavated largely in the early twentieth century, before modern standards of stratigraphic recording. Its collections are nevertheless exceptionally important. Reassessment and improved radiocarbon dating have shown that at least part of its fauna belongs to Marine Isotope Stage 3, well before the Last Glacial Maximum. The wider Irish Quaternary Fauna Project concluded that a considerably richer mammal fauna reached Ireland intermittently between at least about 45,000 and 20,000 years ago.

Castlepook has produced remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. This formidable list should not be turned into a scene in which every species shared one valley on one day. A cave accumulates material in complicated ways: carnivores may drag in prey, water may move bones, collapses may mix layers, and old excavations can obscure original relationships. Yet the assemblage securely changes the scale on which Ireland's Ice Age ecology must be understood. At suitable times, parts of the island supported or were visited by large grazing and browsing mammals, together with predators and scavengers absent from modern Ireland.

Reindeer are especially suggestive of open, cold-adapted country, while mammoth and giant deer indicate extensive plant resources across the wider landscape. Spotted hyaena, known in Ireland principally from Castlepook, is equally important: it warns that some cave bone concentrations may be carnivore accumulations rather than human rubbish. Wolves and hyaenas would have competed for carcasses and may have transported limbs into shelter. The cave therefore documents an ecological network and recurrent movement, not a permanent local herd count. Ireland was connected biologically to Britain and continental north-west Europe at intervals, but the precise routes—whether across exposed shelf terrain, narrowed sea passages or changing coastal margins—remain unresolved.

The Marked Reindeer Femur

One Castlepook object brings the question of people unusually close to this period. A reindeer femur in the old collection has been presented by County Cork heritage material as dating to about 31,000 BC and carries a deep incision interpreted by zooarchaeologist Ruth Carden as a cut made with a sharp stone

tool during carcass processing. If that interpretation is sustained, it is potentially Ireland's earliest evidence that people handled an animal, vastly earlier than the island's securely recognised post-glacial settlement record.

Its significance must be stated with equal care. The bone was not recovered from a modern excavation of a sealed occupation floor. No securely associated hearth, dwelling, human burial, stone-tool assemblage or organised butchery area of comparable age has been found at Castlepook. The date of the animal's death does not independently date the incision, identify its maker, prove where the animal was killed or establish how long any people stayed in Ireland. Surface modification also requires specialist taphonomic judgement, because carnivore damage, trampling, breakage and weathering can leave misleading traces.

The most cautious conclusion is therefore limited but important. In the broader period near 31,193 BCE, reindeer were present in or reached north Cork, and one bone may record cutting with a stone edge. That is compatible with a brief visit by mobile Upper Palaeolithic people exploiting a carcass. It is not proof of a village, a resident population, a regular hunting territory or uninterrupted occupation. Even a genuine cut mark would not reveal whether people hunted the reindeer, found it already dead, removed hide or sinew, took meat, or left the limb where carnivores later carried it into the cave.

Life Beyond the Evidence

For society and everyday life, the archaeological record allows only tightly bounded inference. If humans did visit Ireland in this period, they would have belonged to small, mobile foraging groups able to travel through a demanding cold-stage world and use sharp stone edges. Reindeer and other large mammals could have provided meat, fat, hides, sinew, bone and antler, but none of these specific practices can be demonstrated from the Castlepook femur alone. No Irish evidence of this age identifies a camp layout, family group, language, clothing, boat, weapon type or seasonal round.

There is still less basis for political affairs, diplomacy or warfare. No chieftdom, territory, alliance, conflict or named community can responsibly be reconstructed. The relevant relationships were ecological rather than governmental: herbivores, predators, scavengers, shifting vegetation and advancing ice shaped the opportunities available to any passing people. Nor is there evidence for formal religion, monuments, burials, cave art, writing or institutional learning in Ireland at this date. A possible practical incision on a reindeer bone is not evidence of symbolic art or ceremony.

Trade, in the usual historical sense, is equally invisible. The presence of animals with continental affinities shows that Ireland was not ecologically isolated throughout the Ice Age, but animal dispersal is not commerce. No imported artefact, quarry source, exchange network or boat has been securely associated with Irish human activity around this horizon. The island's later prehistoric monuments, farming settlements and political landscapes lay tens of millennia in the future.

An Archive, Not an Annal

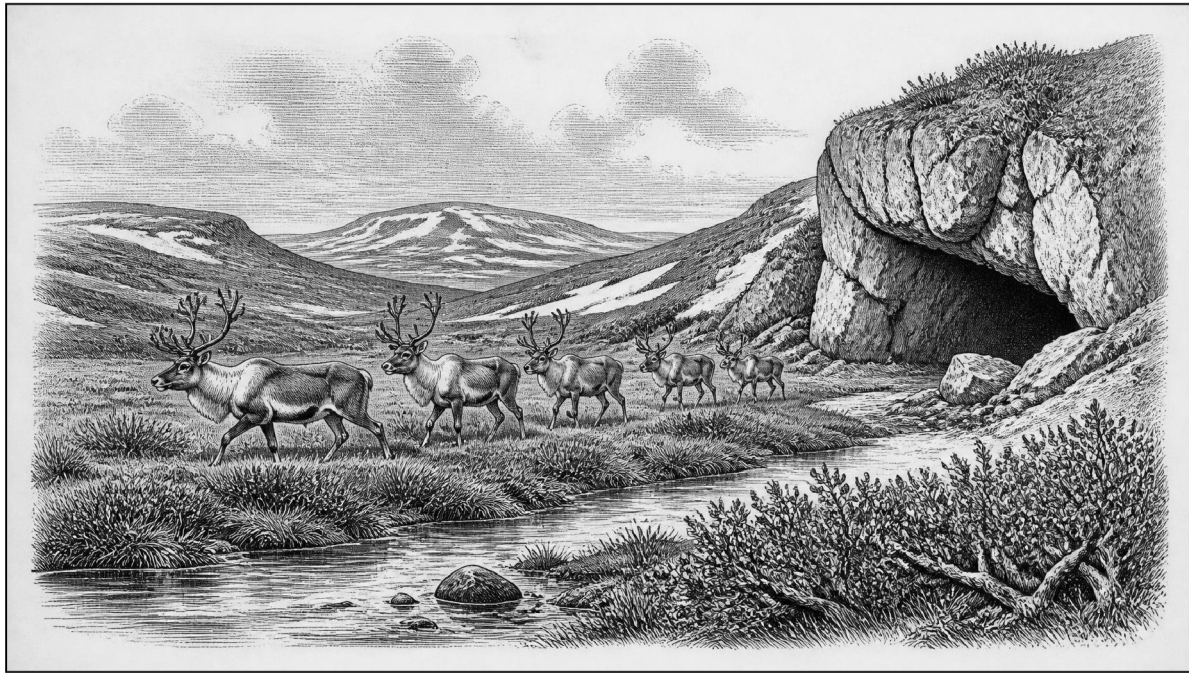
The principal development illuminated by this date is thus environmental and archaeological: Ireland retained, or repeatedly regained, ice-free habitats during a volatile part of the last glaciation; those habitats supported a remarkable cold-stage fauna; and Castlepook preserves a tantalising possible trace of human carcass processing. Derryvree, Greenagho, Aghnadarragh, Crag Cave and Castlepook are not interchangeable records. Each samples a different environment and time range, and each has its own dating and preservation limits.

Later ice advance, erosion, changing sea level and early excavation methods destroyed or obscured much evidence. Future controlled excavation, refined radiocarbon work, microscopic analysis of bone surfaces and sedimentary ancient-DNA research may strengthen, revise or overturn parts of the present picture. For now, 31,193 BCE should be understood not as a year of known Irish events, but as a carefully placed point within a cold, open and changing Pleistocene Ireland—one where mammoths and reindeer belonged to the landscape, and where a single marked bone raises, but does not settle, the question of the first people.

Chapter 009 of 100

31192 BCE

Cork's Deep Bone Question^[9]



Modern calendar-year precision is not available for Ireland in 31,192 BCE. That label corresponds very approximately to 33,141 years before AD 1950, but archaeological and environmental evidence at this depth of time is dated in broad radiocarbon and calibrated ranges, not by individual years. The responsible subject is therefore Ireland during the later part of Marine Isotope Stage 3 (MIS 3), a volatile interval of the last Ice Age. It was long before the fullest expansion of the last British–Irish Ice Sheet, and long before any securely demonstrated, lasting human settlement of the island.

A Date Within Deep Time

The most informative evidence near this notional date does not record a battle, ruler, settlement or named people. It consists of cave bones, waterlogged sediments, fossil plants and insects, glacial deposits, and laboratory measurements made many millennia after their formation. Radiocarbon ages are conventionally counted backwards from AD 1950; because the amount of atmospheric carbon-14 has changed through time, those measurements must be calibrated. At around 33,000 calendar years ago, a result may convert to a wide interval, sometimes with more than one possible part of the calendar curve. A date such as 31,192 BCE is useful for arranging a year-by-year archive, but it cannot identify an event that happened in that year.

In broad terms, this was a cold, open and unstable Irish landscape during MIS 3. Temperatures and ice margins changed repeatedly across centuries and millennia. Ireland was not yet in the most severe phase usually associated with the Last Glacial Maximum, when ice expanded dramatically after roughly 27,000–26,000 years ago and later covered much of the island. Yet this was no mild countryside awaiting later history. The land was shaped by periglacial processes: repeated freezing and thawing, sparse vegetation,

exposed soils and seasonally difficult ground. Its coastlines were also unlike those of today, because global sea level was lower; nevertheless, neither the precise form of the Irish Sea nor a specific route of travel can be reconstructed for this single date.

Castlepook and the Reindeer

The most striking Irish evidence associated with this period comes from Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. Excavations and collecting there in the late nineteenth and early twentieth centuries recovered a remarkable Ice Age fauna. Reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena are among the animals represented in the wider cave collection. Modern re-dating has been especially important: improved pretreatment of bone collagen showed that some older radiocarbon results from Irish caves had underestimated the true age of specimens by thousands of years.

For the horizon around this article's nominal date, reindeer are particularly significant. Their presence is direct evidence for cold-adapted grazing animals in southern Ireland during MIS 3. A cave, however, is not a transparent picture of a living herd. Bones can be brought in by carnivores, dragged by water, moved during collapse, disturbed by later digging or selected by early collectors. Castlepook should therefore be understood as an archive of animal life and deposition over a long period, not as a single camp-site frozen in time.

One reindeer femur fragment has generated exceptional interest because it bears a deep linear mark interpreted by zoologist Ruth Carden as consistent with cutting or chopping by a sharp stone implement on fresh bone. County Cork heritage material has presented the specimen as possible evidence that Upper Palaeolithic hunters processed a reindeer in the Doneraile area about 31,000 BCE. If this interpretation is confirmed, it would extend evidence for human activity in Ireland far beyond the better-established terminal-Pleistocene evidence from County Clare.

That conclusion must remain carefully qualified. The dated bone establishes the age of the animal, not an exact date for the mark or the place where a carcass was killed. The object was recovered from an old cave collection rather than a modern excavation with an associated hearth, stone-tool assemblage, shelter floor or repeated occupation layers. Natural processes can mark and break bone, while cave deposits often mix material of different ages. The incision is an important research question, not proof of a resident population, a village, or a year-specific hunting expedition.

A Country of Open Ground

The Castlepook fauna nonetheless allows a restrained reconstruction of the world beyond the cave. Reindeer indicate open country with forage adequate for herds; mountain hare, Arctic fox and lemmings reinforce the impression of cold, largely treeless environments. Mammoth and giant deer broaden the picture of a productive grazing landscape, though their remains need not all belong to one moment or one locality. Spotted hyaena is equally revealing: it was a powerful scavenger and predator whose denning and bone-accumulating habits may themselves have helped create cave assemblages.

This was not the familiar green, wooded Ireland of later millennia. Pollen, plant macrofossils and insect remains from Irish interstadial deposits point instead towards mosaics of herb-rich tundra, grassland, dwarf shrubs, sedges, mosses and wet ground. Plant cover would have varied by exposure, drainage, altitude and season. Summers could produce a brief but biologically active growing season;

winters were severe, and permafrost or deeply frozen ground affected drainage and soil formation. The apparently empty expanses of a cold landscape could sustain specialised herbivores, carnivores and scavengers, but they did not necessarily support humans year-round.

Derryvree's Buried Wetland

In County Fermanagh, near Maguiresbridge, the Derryvree sequence provides a complementary record. Roadworks exposed sediments within a drumlin: an older glacial till below, freshwater silts, sands and organic deposits in the middle, and later till above. This sequence demonstrates a non-glacial interval between advances of ice. During that interval, pools, marshes or shallow-water habitats accumulated sediment and preserved organic remains; a subsequent glacier sealed them beneath fresh debris.

A radiocarbon determination from Derryvree, BIRM-166, was reported as 30,500 radiocarbon years BP with a substantial uncertainty. Calibration produces a broad calendar range rather than a date that can be attached to a particular season or year. It is reasonable to treat the deposit as evidence for an ice-free or locally ice-free environmental window in later MIS 3, broadly overlapping the world represented by the 31,192 BCE label. It is not responsible to claim that a particular Derryvree pool existed in that numbered year.

The organic remains are valuable because they show that cold Ireland was not simply an unbroken ice sheet. Records from inter-till deposits include aquatic and wetland plants such as bogbean and water-milfoil, alongside mosses, sedges and cold-tolerant terrestrial flora. Beetle and other biological evidence can add details about ground conditions and vegetation. Together, they point to freshwater habitats set within an open, cold landscape. Such places would have concentrated food for animals and created sheltered patches of productivity, although no evidence demonstrates human use of Derryvree at this time.

People: Possibility, Not Population

Across north-west Europe, *Homo sapiens* communities of the Upper Palaeolithic made sophisticated stone tools, used animal skins and bone, maintained social networks across large territories, and in some regions created ornaments, figurative objects and cave art. It would be misleading, however, to transfer all of that evidence automatically to Ireland. No securely associated Upper Palaeolithic tool-kit, human remains, dwelling, burial, art panel or hearth of approximately 33,000 years ago has been recovered from the island.

If the Castlepook mark is human-made, the most cautious interpretation is a brief visit or a small-scale hunting and carcass-processing episode, perhaps made by mobile people moving through the western fringe of the European world. A party following reindeer or exploiting seasonal resources need not have founded a permanent colony. Conversely, the absence of sites cannot prove that no person ever arrived: later glaciation eroded and buried landscapes, changing coastlines drowned possible sites, and Irish cave collections are unevenly excavated and documented. The evidence supports uncertainty rather than a simple tale of either settlement or total emptiness.

No Politics, but a Real Past

There can be no responsible account here of political affairs, diplomacy, warfare, law, religion or learning in the conventional historical sense. There are no names, monuments, inscriptions or settlements from which to infer institutions or beliefs. Nor is there evidence for farming, trade routes, metalwork or

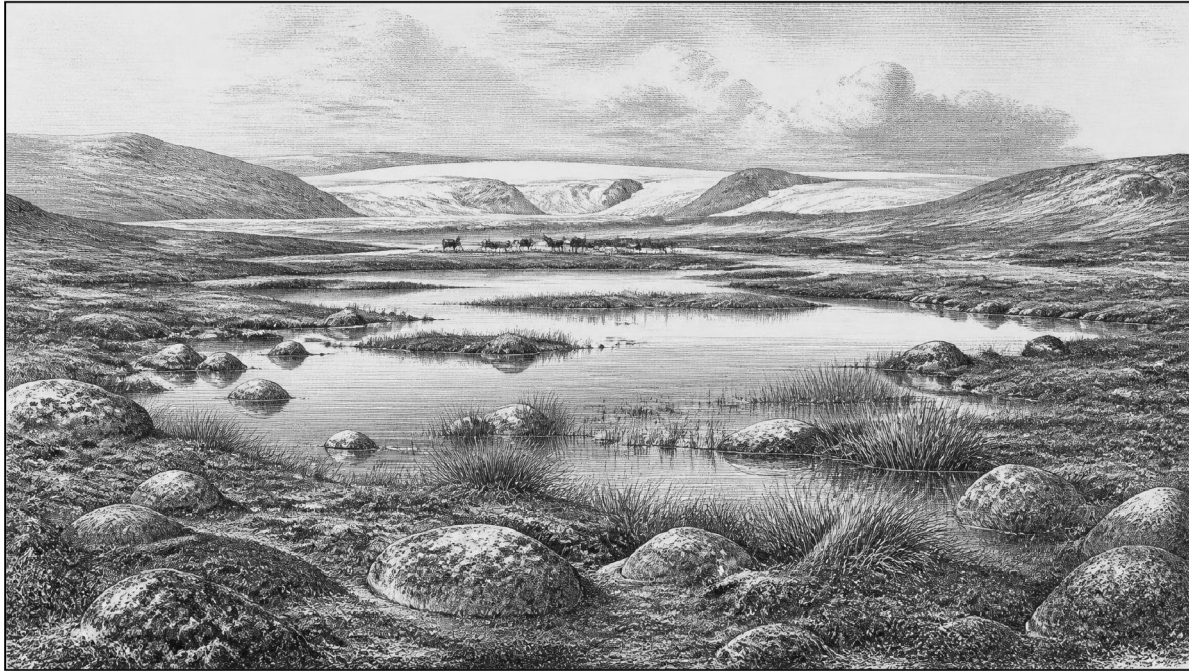
organised exchange within Ireland. Any claim that reindeer hunters were “Irish”, that they belonged to a known archaeological culture, or that they held particular religious ideas would exceed the evidence.

Yet the period is not ahistorical. Around the notional year 31,192 BCE, Ireland formed part of a changing north-west European ecological zone. Its story survives in a reindeer bone from Cork, cold-water sediments beneath a Fermanagh drumlin, and faunal assemblages whose dates have been transformed by modern laboratory methods. The great development of this interval is not a recorded human event but the survival of evidence through later ice, erosion and excavation. Castlepook’s marked femur and Derryvree’s wetland deposits remind us that Ireland’s deepest past is reconstructed from traces: powerful enough to revise old assumptions, but too fragile to bear inventions.

Chapter 010 of 100

31191 BCE

Derryvree's Freshwater Ledger^[10]



31,191 BCE is a modern label imposed on a time far beyond the resolution of Ireland's archaeological record. In the conventional system that counts backwards from AD 1950, it falls at roughly 33,140 calibrated years before present (cal BP). That arithmetic is only a place on a modern timeline, not a date at which a particular Irish event can be identified. No written calendar, annually layered historical archive, settlement surface or securely dated human biography permits precision to a single year. The responsible subject is Ireland during the later part of Marine Isotope Stage 3, a fluctuating phase of the last Ice Age.

The island was not yet the uniformly ice-covered Ireland of the Last Glacial Maximum, but neither was it the green, wooded island of later prehistory. Its surviving evidence is sparse and uneven: freshwater sediments buried beneath glacier deposits in Fermanagh, cave bones from Cork, landforms, pollen, plant remains, insects and radiocarbon measurements. These sources illuminate habitats and broad chronological intervals. They do not yield kings, peoples, battles or a national narrative for this particular numbered year.

A Date Within a Wide Range

Radiocarbon dates are not calendar dates read directly from a bone or organic sediment. Carbon-14 levels in the atmosphere have varied through time, so laboratory ages must be calibrated against independently dated records. IntCal20, the current Northern Hemisphere calibration curve, reaches back to 55,000 cal BP, but uncertainty remains substantial at this depth of time. A date expressed as 31,191 BCE therefore cannot be treated as a known season, generation or event.

The most relevant Irish chronological anchor lies at Derryvree, near Maguiresbridge in County Fermanagh. Road-cutting in 1969 exposed a drumlin containing freshwater silts and fine sands trapped between two thick, distinct layers of till: sediment laid down by glacier ice. The sequence establishes a clear order. An earlier glacial phase deposited the lower till; an interval without ice at that locality allowed a wetland or shallow freshwater body to accumulate sediment and organic material; a later glacier overrode and sealed the deposit beneath upper till.

Organic material from the Derryvree freshwater series produced a conventional radiocarbon age of about 30,500 $\pm$ 1,170–1,030 radiocarbon years BP. Published calibration has placed it broadly between about 36,900 and 31,700 cal BP. The modern label 31,191 BCE, or roughly 33,140 cal BP, falls inside that large range. It cannot be assigned to a particular layer, plant, insect or episode in the pool. Yet Derryvree provides an unusually valuable local window onto conditions broadly comparable in age.

Fresh Water Beneath the Ice

Derryvree's importance lies in its physical survival. Later ice and sediment buried the freshwater deposits, protecting a rare environmental archive even as that same ice erased or rearranged much of the surrounding landscape. Pollen, plant macrofossils and insect remains from such deposits are direct evidence for organisms that lived in or near the water; the sedimentary setting records open fresh water rather than a settled village or a cultivated landscape.

The evidence points to treeless, cold-stage country with wet hollows and open ground, not to forest. In northern Ireland, related Middle Midlandian deposits at Greenagho near Belcoo and at other inter-till sites reinforce the conclusion that ice cover was episodic and regional. The vegetation would have been constrained by short growing seasons, cold winters and exposed terrain. Grasses, sedges, low herbs, mosses and dwarf woody plants are more defensible images than woodland. A freshwater basin could sustain aquatic and waterside life even where the wider landscape was severe.

This was not an empty wasteland. Nor was it a comfortable or stable refuge. Seasonal thaw, standing water, frost-heaving ground and changing snow cover would have shaped where animals could graze and where any people could travel. The important distinction is between evidence and inference: the buried silts demonstrate local freshwater conditions and an interval without overriding ice; the wider reconstruction of tundra-like mosaics is an interpretation supported by fossil assemblages, regional comparison and glacial context.

An Island in Glacial Transition

Ireland around this horizon stood within a changing north-west European ice-age world. Reconstructions of the British–Irish Ice Sheet indicate that the island's later, much more extensive glaciation developed after this broad interval. The sheet reached its maximum extent around 25,000–23,000 years BP, when ice extended near the continental shelf break and the Irish Sea Ice Stream occupied much of the Irish and Celtic Seas. That later maximum must not be projected wholesale backwards onto 31,191 BCE.

Equally, Derryvree must not be taken as proof that all Ireland was ice-free at the same time. Ice accumulated first and most persistently on high ground and its margins did not advance as a single, neat island-wide front. Recent British–Irish reconstructions begin at 31,000 BP because earlier margin evidence is patchy, and modelled ice centres include Northern Ireland. Around 33,140 cal BP, different

Irish regions may have experienced sharply different conditions: exposed lowlands and wetlands in some areas, local mountain glaciers or growing ice caps in others, and coastlines whose positions differed markedly from those of today because global sea level was lower.

There was no political geography in any meaningful sense. No evidence identifies territories, rulers, diplomatic relations or organised warfare in Ireland at this time. Ice, water, terrain and the movements of animals were the principal forces structuring the island's available landscapes.

Castlepook's Animal Archive

County Cork offers another, very different archive. Castlepook Cave, near Doneraile, was excavated principally in the early twentieth century and yielded one of Ireland's most significant collections of Pleistocene animal remains. Its fauna includes remains attributed to reindeer, woolly mammoth, giant deer, brown bear, wolf, fox, hare, lemmings and spotted hyaena. The cave deposits demonstrate that Ireland was visited or inhabited by a wider range of cold-stage mammals than the modern fauna suggests.

Modern redating has made this record more valuable but also more complicated. Improved ultrafiltration methods showed that some earlier cave-bone dates were too young by thousands of radiocarbon years. The reassessment of Castlepook confirms that key animals belonged to Marine Isotope Stage 3 and indicates that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum. However, antiquarian excavation, carnivore activity, water movement and disturbed cave sediments mean that the bones cannot safely be assembled into a single living community or a snapshot of one year.

Reindeer are especially relevant to the imagined landscape around this date. Their presence supports the picture of open, cold country with seasonally available grazing. Hyaena remains matter too: caves were not necessarily human shelters but could be carnivore dens and bone accumulators. Mammoth and giant-deer material evokes large-herbivore movements across wider terrain, but it does not prove that every species was present beside the Derryvree pool, or even alive simultaneously.

The Human Question

A reindeer femur from Castlepook has been described by Dr Ruth Carden as bearing a mark made by a sharp stone tool while the bone was fresh. County Cork heritage material associates the bone with approximately 31,000 BCE and presents it as potential evidence of Upper Palaeolithic butchery. If confirmed, it would be an exceptionally early indication that people reached Ireland during the last Ice Age, perhaps as mobile hunters exploiting animal resources during a more favourable phase.

That possibility must remain carefully qualified. The bone derives from an old cave collection, rather than a newly excavated occupation floor with tools, hearths, shelters, repeated domestic debris or human remains in secure association. The age of an animal bone is not, by itself, the age of a surface mark, nor does a possible cut mark demonstrate permanent settlement. No securely associated stone-tool assemblage of this age has been recovered in Ireland. The evidence may indicate a brief human encounter with a carcass; it cannot yet establish a resident population, a named group or a continuous tradition of occupation.

Life Beyond the Reach of Certainty

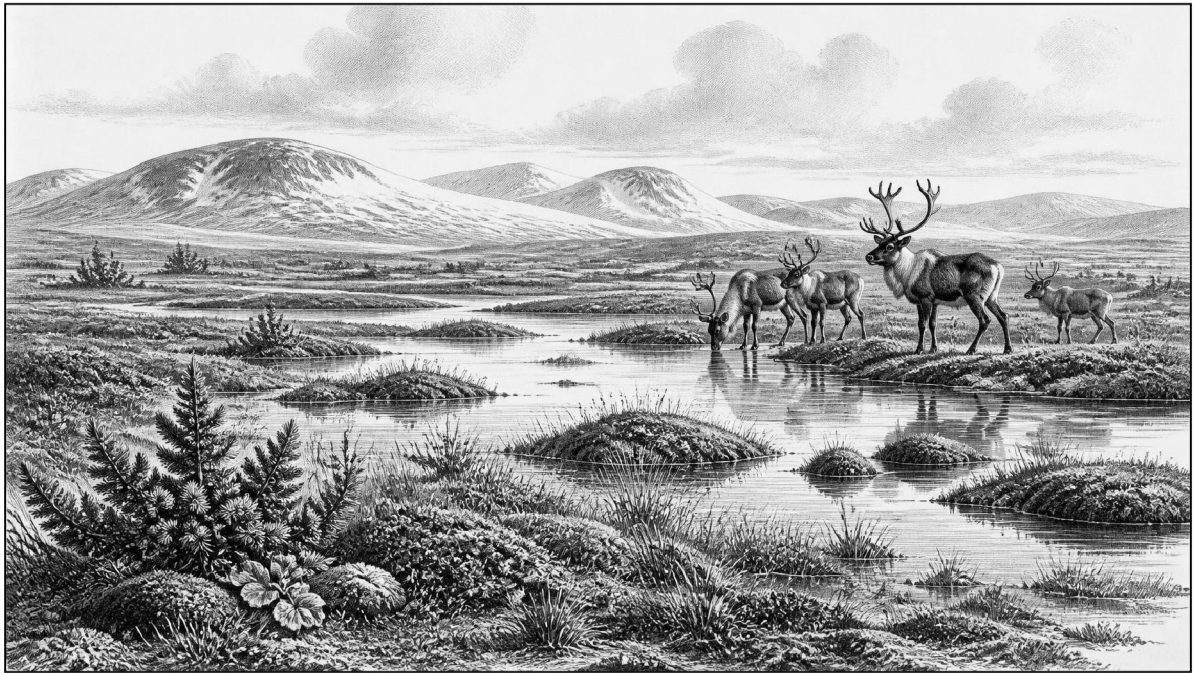
For society, religion, culture and learning, the honest answer is that the evidence is silent. There are no known houses, graves, monuments, artworks, ritual deposits, fields, storehouses or workshops in Ireland that can be securely assigned to this horizon. Nor is there evidence for trade. If people did enter the island, their economy would most plausibly have depended on highly mobile hunting, gathering and the skilled use of perishable materials and stone tools, as among Upper Palaeolithic communities elsewhere in north-west Europe. That is a regional analogy, not a demonstrated description of an Irish camp.

Derryvree's buried freshwater sediments and Castlepook's bones are therefore more significant than any invented event could be. Together they show an Ireland of ecological opportunity amid profound climatic constraint: local water and open ground, large mammals and predators, expanding ice and changing routes across a lower-sea-level north-west Europe. The record is fragmentary, but its restraint is its strength. Around 31,191 BCE, Ireland is best understood not as a stage for year-by-year history, but as a shifting late-Pleistocene landscape whose surviving traces still test the limits of what can responsibly be known.

Chapter 011 of 100

31190 BCE

Derryvree's Willow Marsh^[11]



The label 31,190 BCE is a modern chronological convenience, not a year that can be recovered from an Irish record. Nobody on the island used this calendar; no written source, settlement layer or dated event can identify a particular season, journey or death at that precision. In radiocarbon convention it falls about 33,139 years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3, a long, climatically volatile part of the last Ice Age. The responsible history of Ireland at this point is therefore one of calibrated ranges, buried sediments, fossil animals and changing ice, rather than rulers, wars or institutions.

The closest securely relevant Irish chronological anchor comes from Derryvree near Maguiresbridge, County Fermanagh. Organic freshwater silts and fine sands there produced a radiocarbon age of $30,500 \pm$ roughly 1,100 radiocarbon years BP. Older published calibrations place this deposit broadly between about 36,900 and 31,700 calibrated years BP, equivalent to approximately 34,950–29,750 BCE. The notional date considered here lies within that wide range. It does not mean that the entire deposit, still less an identifiable human action, belongs to 31,190 BCE. Calibration curves translate radiocarbon measurements into calendar ranges because atmospheric carbon-14 has varied over time; at this antiquity, ranges remain broad and must be treated as such.

Freshwater Between the Ice

Derryvree is important because its stratigraphy preserves a sequence of environmental transformation. Roadworks exposed a drumlin cut by two deposits of till, the unsorted sediment left by glacier ice. Between them lay the organic freshwater bed. The order of these layers is direct evidence that ice had covered the locality, then retreated or ceased to occupy it long enough for water, plants, insects and fine

sediment to accumulate, before ice returned and sealed the record beneath renewed glacial material. This is not a picture of all Ireland at one time, but it is unusually strong evidence for local ice-free conditions in north-central Ireland during a cold interval.

The plant and animal traces in the Derryvree sediments point to a treeless, periglacial wetland rather than a forested landscape. Pollen, plant macrofossils, mosses and beetles indicate grasses, sedges, herbs, juniper and cold-adapted aquatic and marsh vegetation. The old term *muskeg* is useful if used carefully: it conveys waterlogged ground rich in moss and plant matter, with pools and wet hollows, not a modern peat bog copied unchanged into the past. Open water must have persisted seasonally or locally for freshwater organisms and sediment to accumulate. Yet the surrounding country was severe, exposed and without the closed woodland familiar from later Irish prehistory.

At this date Ireland should not be imagined as a fixed white wilderness. The island's climate and glacier margins changed over long spans and differed between regions. Derryvree demonstrates that a locality now in Fermanagh could sustain a cold freshwater ecosystem during an interval framed by glaciation. Greenagho, also in Fermanagh, preserves another organic deposit beneath till whose dates show that ice-free phases occurred in the wider region. Cave calcite records, glacial landforms and later dating programmes add to the picture of a landscape repeatedly reorganised by cold, water and ice. They do not support a simple claim that every part of Ireland was either wholly ice-covered or wholly habitable at the same moment.

An Open Northern Landscape

The evidence permits a restrained reconstruction of everyday ecology. Around wetland pools at Derryvree, sedges and other low plants could root in saturated ground; mosses and shallow-water species occupied suitable niches; beetles moved among decaying vegetation and exposed soil. Beyond the wetter places, wind and frost would have favoured short, discontinuous plant cover. Juniper pollen does not prove a dense juniper scrub, but it suggests that woody plants could survive somewhere in the local or regional landscape. There is no basis for portraying the area as productive farmland, thick woodland or a settled lakeside community.

Seasonality probably shaped everything. Long cold winters, frozen or waterlogged ground, snow cover and strong winds would have restricted plant growth. Brighter summers could nevertheless produce brief bursts of vegetation and insect activity, and wetland corridors could be more biologically productive than exposed ground. Such variation mattered to grazing animals and any travelling people. It also explains why sediments like Derryvree's are so valuable: a small basin could retain evidence of life that later ice advances stripped from hillsides and valley floors.

Caves and Cold-Stage Animals

County Cork's Castlepook Cave, near Doneraile, supplies a second, very different archive. Its old collections include remains attributed to mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Direct radiocarbon dating undertaken through the Irish Quaternary Fauna Project showed that a wide range of mammals reached Ireland between at least about 45,000 and 20,000 years ago. Some Castlepook specimens belong to the broad pre-Last Glacial Maximum span relevant to 31,190 BCE. Reindeer, mammoth and spotted hyaena are especially evocative evidence that Ireland was connected ecologically to the wider north-west European cold-stage world.

But a cave-bone assemblage is not a census of animals standing together on one day. Castlepook was investigated largely in the late nineteenth and early twentieth centuries, when excavation and recording standards were very different; collections were later reduced, moved and reassessed. Water action mixed bones of different ages, while carnivores, natural traps and other processes may have contributed to their accumulation. Hyaenas may have used parts of the cave as dens. Thus, the fossils prove that these species occurred in Ireland across a long period, but cannot safely establish the exact composition of a 31,190 BCE herd, hunting ground or predator community.

The Human Question

The most provocative item is a reindeer femur from Castlepook, examined by the zooarchaeologist Ruth Carden. A deep surface mark has been interpreted as consistent with cutting by a sharp stone tool during carcass processing, and Cork heritage material has associated the bone broadly with about 31,000 BCE. If that interpretation and dating are sustained, it would indicate that people reached Ireland far earlier than the formerly secure evidence for terminal-Pleistocene human activity. It would be an important sign of a brief Upper Palaeolithic presence in a cold, animal-rich landscape.

It remains essential, however, to state what this single bone cannot show. No securely associated hearth, stone-tool assemblage, dwelling floor, burial, art panel, human bone or intact occupation surface of comparable age has been identified in Ireland. The cave's disturbed, time-mixed deposits make association difficult. A cut mark on a reindeer limb, even if human-made, demonstrates a limited act of carcass processing, not permanent residence, population size, language, ancestry or social organisation. It cannot tell us whether visitors arrived repeatedly, followed migrating prey, crossed during a particular season, or left descendants. The National Museum of Ireland's cautious public account still notes the absence of clear Palaeolithic evidence for humankind on the island.

No Politics, No Proven Trade

Accordingly, political affairs, diplomacy and warfare cannot be reconstructed for Ireland in this period. There is no evidence for chiefs, kingdoms, tribal names, territorial boundaries, treaties or organised conflict. Nor is there Irish evidence at this date for farming, domesticated animals, pottery, monuments, metalworking, formal religion or writing. If people were present, the most defensible inference is of very small, mobile foraging parties with a capacity to use stone cutting edges and exploit animal resources. Even that is conditional on the Castlepook incision being confirmed as a human cut mark.

Trade is equally unproven. Ireland's fauna demonstrates that animals could reach the island or its then-changing margins from the wider British and European world, but animal movement is not evidence of human exchange. Low sea levels altered coastlines substantially, and later rising seas submerged many potential routes and coastal sites. Yet neither a route nor a land connection should be presumed for a particular year. The mechanisms by which animals, and perhaps people, moved to and from Ireland remain questions of palaeogeography and chronology rather than established travel history.

The Approach of Greater Ice

Although 31,190 BCE preceded the fullest expansion of the Last Glacial Maximum, it belongs to the longer build-up towards it. Modern reconstructions of the British–Irish Ice Sheet show that its sectors advanced asynchronously, with major growth between roughly 30,000 and 22,000 years ago and maximum ice volume around 23,000 years ago. Later ice profoundly reshaped Ireland: it eroded surfaces, displaced sediments, buried organic beds and removed much of the archaeological evidence that a less glaciated landscape might have retained. Derryvree survived precisely because its wetland deposit was sealed between tills.

For this reason, Ireland around 31,190 BCE is not a blank page, but neither is it an annual chronicle. Derryvree's willow-and-sedge wetland, Castlepook's cold-stage animals and the approaching expansion of ice provide a grounded picture: a sparsely evidenced, open and seasonally demanding landscape, intermittently capable of supporting freshwater life and large mammals. A possible human trace invites investigation, not certainty. The central historical fact is environmental change on a scale that would determine what evidence endured at all.

Chapter 012 of 100

31189 BCE

Maguiresbridge's Organic Bed^[12]



The label 31,189 BCE is not a date at which an Irish event can be placed. No calendar, settlement sequence or written tradition reaches remotely this far into the past. It is a modern chronological convenience: roughly 33,138 years before AD 1950, the reference point used for “before present” dating. The responsible history of Ireland at this depth is therefore not a story of named people or annual happenings. It is a reconstruction from sediments, fossils and glacial landforms, each with its own dating uncertainty.

The closest unusually detailed Irish evidence is a freshwater deposit found beneath a drumlin at Derryvree, near Maguiresbridge in County Fermanagh. Its conventional radiocarbon measurement, BIRM-166, was $30,500 \pm 1,100$ radiocarbon years BP. When calibrated, it spans broadly about 36,900–31,700 calendar years BP. That wide interval overlaps the modern label 31,189 BCE, but it does not mean that the silt was laid down in one identifiable year. It records a cold-phase environment at some point within a long and unstable stretch of the last Ice Age.

A Wetland Between Ice Advances

Derryvree was exposed in road cuttings during 1969. Investigators found freshwater silts and fine sands enclosed between two substantial layers of till: debris deposited directly by glacier ice. This sequence is the essential fact. Before later ice covered and reshaped the district, an area of open water, wet ground and plant growth existed there long enough to leave organic traces. The upper till eventually sealed that evidence, preserving it beneath the drumlin that is visible today.

The fossils do not describe a mild, wooded Ireland. Pollen was predominantly from herbs, while plant macrofossils and insect evidence point to a cold, open, largely treeless wetland—often described as tundra or muskeg-like. Mosses, sedges and hardy flowering plants grew around pools and waterlogged ground.

Dwarf willow and other low vegetation could occupy sheltered or damp niches. There were short productive seasons, but severe winters, frost-disturbed soils and little shelter from trees. Sparse grains from trees such as pine or hazel cannot safely be read as evidence of nearby forest: pollen may travel far beyond the plants that produced it.

This was not a dead landscape. Freshwater mud requires liquid water; aquatic and marsh plants require a growing season; insects require habitats and food. Yet biological activity should not be mistaken for abundance in the modern sense. A low, windswept mosaic of wet hollows, sedge margins, exposed mineral ground and scattered dwarf shrubs is a better guide than any picture of later Irish pasture, bog or woodland. The local landscape was shaped by cold as much as by life.

Before the Greatest Expansion

The wider climatic setting was Marine Isotope Stage 3, a long and fluctuating part of the Late Pleistocene. It preceded the best-established maximum of the last British–Irish Ice Sheet. Modern reconstructions show that ice growth, maximum extent and retreat were not simultaneous in every Irish region: margins advanced and altered according to topography, precipitation, sea level and the behaviour of marine-terminating ice. The major maximum came later, broadly during the interval from about 27,000 to 23,000 years ago in the Irish sector, rather than at the notional year considered here.

Derryvree is consequently important because it rules out a simple image of Ireland as continuously and uniformly buried beneath ice throughout the late Ice Age. It demonstrates locally ice-free conditions in north-central Ireland during part of this earlier cold phase. It does not prove that every county was ice-free at once. Uplands, western coasts, the Irish Sea basin and inland lowlands could have had sharply different conditions, and the evidence for ice cover before the later maximum remains incomplete. The strongest conclusion is local and chronological: a freshwater tundra wetland existed at Derryvree before renewed glaciation covered the site.

Sea level was also much lower than today, exposing extensive shelves around north-west Europe. Ireland's coastlines were therefore very different, and crossings between land areas may at times have been easier than in the modern geography. But exact routes, shorelines and seasonal accessibility cannot be fixed for 31,189 BCE from the Irish evidence alone. The animal record shows that terrestrial mammals reached Ireland during favourable intervals; it does not provide a map of a particular crossing in a particular season.

Cork's Time-Averaged Fauna

Far to the south, Castlepook Cave near Doneraile in County Cork provides a complementary record. It has produced Ireland's richest known assemblage of Late Pleistocene mammals, including reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Such animals demonstrate that Ireland was repeatedly part of wider north-west European ecological networks during the last cold stage. Large grazers and browsers imply open country capable, at least intermittently, of sustaining substantial herbivores; predators and scavengers indicate a more complex food web than Ireland's later historical fauna suggests.

There is an important qualification. Castlepook is not a sealed snapshot of one valley or one generation. Its cave deposits accumulated through animal deaths, carnivore activity, water movement, sediment disturbance and early twentieth-century excavation. Re-dating has shown that several older determinations underestimated the age of specimens by thousands of years. Mammoth, hyaena, bear and

reindeer remains from the assemblage need not represent one simultaneous community, and neither can they automatically be assigned to the Derryvree wetland interval. They establish repeated animal presence across a broad part of Marine Isotope Stage 3, not a census for this notional year.

Even so, the two records illuminate one another. Derryvree supplies the closest local environmental evidence: cold freshwater habitats and treeless vegetation in Fermanagh. Castlepook supplies the broader faunal possibility: open Irish landscapes were sufficiently accessible, at different times, for large herbivores and their predators to enter or persist. The Ireland of this period was not an isolated, fixed island landscape. It was an ecologically changeable western edge of the European cold-stage world.

The Human Question

One Castlepook object has made this era especially significant for Irish archaeology: a reindeer femur carrying a deep mark interpreted by its researcher as a cut or chopping trace made with a sharp stone tool while the bone was fresh. The bone has been publicised as dating to roughly 33,000 years ago, and, if the modification is confirmed as human-made, it would push evidence of human activity in Ireland vastly earlier than the securely documented post-glacial settlement record. It may indicate that a person or small group processed a reindeer carcass during a cold-stage visit.

That proposition must remain carefully limited. The femur is not a securely excavated campsite with associated tools, hearths, dwelling floors, burials or a sequence of repeated occupations. A modified bone, even if anthropogenic, cannot demonstrate a permanent population, a named culture or a settled hunting territory. Its exact relationship to 31,189 BCE is also unproven: the dating terminology used in public accounts must not be converted casually between radiocarbon years, calibrated years and BCE dates. It is evidence for a serious research question, not a licence to invent an Irish Palaeolithic community.

What Cannot Be Recovered

For that reason, there are no responsibly identifiable political affairs, wars, diplomacy, rulers, laws or territorial boundaries for Ireland at this point. There is likewise no direct Irish evidence for ritual monuments, formal religion, art, language, teaching, trade partnerships or social institutions. Upper Palaeolithic groups elsewhere in Europe made sophisticated tools, ornaments and images, but similarity in date does not establish that those practices occurred in Ireland. Importing continental evidence as if it were Irish would turn analogy into fact.

Everyday life is nearly as elusive. If people did reach Ireland, they would probably have needed exceptional knowledge of weather, terrain and animal movement to survive in a cold, exposed environment. That is a reasonable inference from the landscape and fauna, not evidence for specific homes, family structures, clothing, boats or seasonal routes. Likewise, a possible butchery mark may suggest carcass processing, but it does not reveal an Irish economy, established trade or regular hunting rounds.

A Deep-Time Irish Landscape

The principal development illuminated around 31,189 BCE is environmental change. At Derryvree, freshwater and organic sediment accumulated in a cold, treeless wetland during a pause between ice advances. Across Ireland, climatic instability, lower sea level and shifting ice margins altered what land

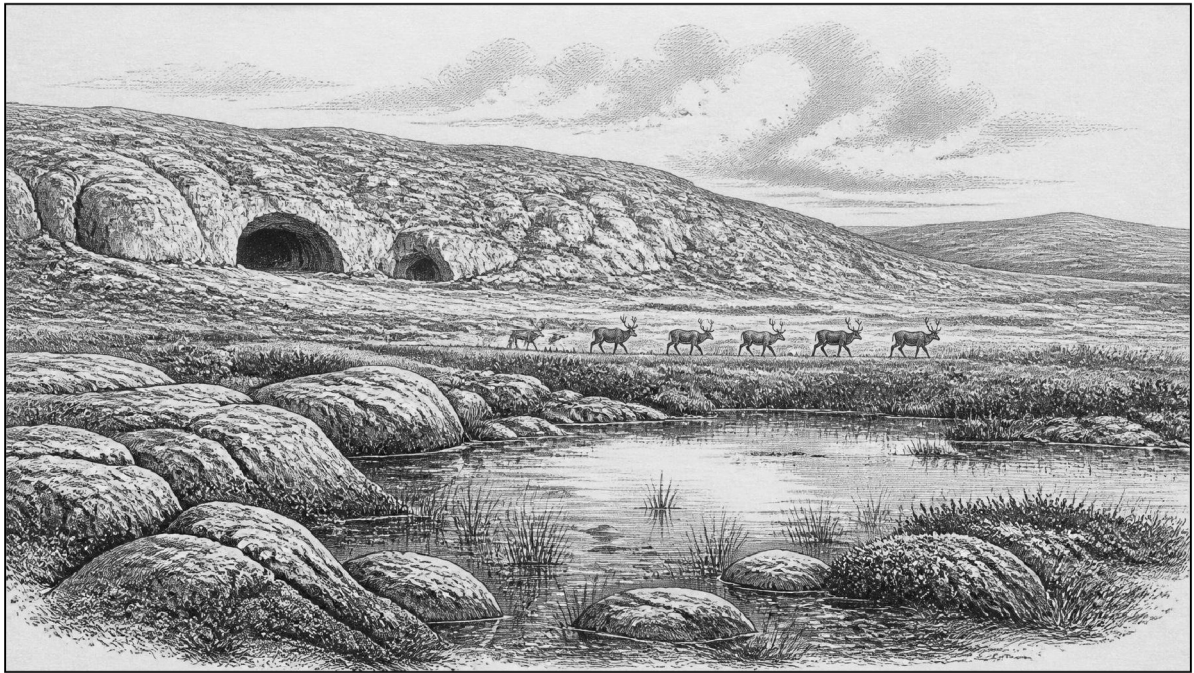
was available to plants, animals and perhaps occasional people. Later glacier expansion would bury, erode and redistribute much of that fragile record.

This is therefore a history of limits as well as discoveries. The buried organic bed at Maguiresbridge proves that part of Ireland supported a living periglacial wetland; it does not supply an annual chronicle. Castlepook proves that remarkable cold-stage animals reached Ireland; it does not make them all contemporaries. A marked reindeer bone raises the possibility of a very early human presence; it does not yet demonstrate settlement. Such restraint is not a deficiency. It is the achievement of the evidence: a narrow but vivid glimpse of Irish ground, water, mosses, sedges and animals before the landscape was once again transformed by ice.

Chapter 013 of 100

31188 BCE

Blackwater Limestone Fauna^[13]



The label *31,188 BCE* is useful for placing this article in a long chronological sequence, but it must not be mistaken for a date that archaeology can identify in Ireland. No written calendar existed, and neither human activity nor an environmental change can be assigned responsibly to that particular year. Expressed in scientific terms, the point falls at roughly 33,100 calendar years before 1950, within the later part of Marine Isotope Stage 3 and before the Last Glacial Maximum. The available evidence consists of dated animal remains, cave deposits, pollen, insects, plant macrofossils, sediment layers and models of ice-sheet growth. Each comes with sizeable ranges and interpretative limits.

An Island in a Changing Cold Stage

Ireland at this time was part of the Late Pleistocene world: cold, climatically unstable and ecologically unlike the later wooded island. It was not yet at the fullest extent of the last British–Irish Ice Sheet. The maximum glaciation belongs broadly to the succeeding millennia, but ice was growing and changing rapidly around the island. Modern reconstructions remain deliberately cautious about precisely where ice lay at around 31,000 years ago: in some sectors the evidence can support either ice-free or ice-covered conditions. This uncertainty is important. A map with a sharp ice margin for 31,188 BCE would imply an accuracy the evidence does not possess.

Nonetheless, several Irish records show that parts of the island had supported terrestrial environments during the wider interval relevant to this date. At Derryvree near Maguiresbridge, County Fermanagh, a freshwater deposit of fine sands and organic silts was found trapped between two tills within a drumlin. Its

radiocarbon determination, Birm-166, was 30,500 years BP with a substantial error range; later calibration places the deposit broadly in the interval c. 36,900–31,700 calendar years BP. That range includes the approximate chronological horizon represented by 31,188 BCE, but does not date an event in that year.

The Derryvree deposit records an open, treeless and periglacial setting. Pollen, seeds, mosses and insects point to tundra or muskeg-like ground: wet places with pools and plant-rich mud, bordered by sedges, grasses, herbs and low-growing vegetation. Such evidence provides an environmental comparison, not a panoramic picture of all Ireland. It indicates that at least one north-central locality had cold freshwater habitats before later ice overrode and sealed the deposit. The most responsible conclusion is therefore regional: habitable patches existed in parts of Ireland during the wider middle-to-late glacial interval, while the extent, duration and connectedness of those patches changed profoundly.

Castlepook and the Animal Record

The richest evidence close to this horizon comes from Castlepook Cave near Doneraile in north County Cork, on limestone country north of the River Blackwater. Excavations begun in the nineteenth and early twentieth centuries, supplemented by later work and radiocarbon dating, produced Ireland's most important assemblage of Ice Age vertebrates. The cave has yielded remains attributed to woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. It demonstrates beyond doubt that Ireland's Pleistocene fauna was once far more diverse than the later historic fauna.

But Castlepook is not a single, undisturbed camp surface. Its animal remains accumulated across a very long period; some were moved or mixed by animals, water, collapse, earlier excavation and the cave's own complex sedimentary history. Direct dates from bones extend across tens of millennia. A mammoth rib, reindeer metacarpal, brown-bear bones, giant-deer elements and hyaena remains cannot automatically be treated as members of one herd, one food chain or one season. The cave is best understood as a time-depth archive rather than a frozen moment.

Even so, the dated fauna supplies a plausible ecological frame for Ireland around the nominated date. Reindeer are especially significant. Their presence is consistent with open ground, seasonal mobility and forage in a landscape where woodland was limited or absent. Mammoth and giant deer suggest the capacity of some landscapes to sustain very large herbivores, while hyaena and wolf attest to substantial predators and scavengers. Lemmings and Arctic fox reinforce the cold character of the fauna. This was not a uniformly sterile land beneath permanent ice. Nor was it a mild, settled countryside: it was a variable cold-stage environment in which shelter, forage and access to unfrozen water could be highly local and seasonal.

A Mark on a Reindeer Bone

The reason this period has gained particular prominence in Irish prehistory is a reindeer femur from Castlepook. County Cork heritage publications report that a mark on the bone was examined as a possible chop or cut made by a sharp stone tool, and that the bone dates to about 33,000 years ago, often rendered for general audiences as about 31,000 BCE. If that interpretation is sustained, it would represent evidence that people handled, and perhaps butchered, a reindeer in Ireland during the Upper Palaeolithic—far earlier than the previously accepted evidence for human activity on the island.

The qualification matters as much as the possibility. The specimen is not part of a securely excavated occupation floor with a hearth, a cluster of stone tools, butchered bones and a stratigraphic sequence dating a visit. A single surface modification can be informative, but it must be distinguished from damage caused by carnivore teeth, sediment movement, trampling, breakage, excavation or later handling. The bone therefore supports a serious research question, not a full account of a Palaeolithic community. It is reasonable to describe it as possible evidence of human butchery; it is not reasonable to infer a permanent settlement at Doneraile, a population size, a language or a named cultural group.

There is a further chronological caution. The date obtained from bone collagen dates the death of the reindeer, within its scientific range, rather than the exact moment a mark was made. The translation of a radiocarbon age into BCE also depends on calibration curves, which convert atmospheric radiocarbon measurements into calendar-age probabilities. At this depth of time, calibration commonly produces ranges, not anniversaries. “Around 31,188 BCE” should thus be read as a modern indexing point near a broader dated horizon.

People: Presence Is Not Settlement

Across western Europe, the Upper Palaeolithic was already an age of highly mobile *Homo sapiens* hunter-gatherers using sophisticated stone technologies, clothing, fire, social networks and, in some regions, figurative and cave art. Ireland cannot simply be assigned the same record. No securely associated Upper Palaeolithic toolkit, dwelling, burial, hearth or artwork is presently known from Ireland at this date. The archaeological evidence does not allow us to describe a local Irish society, still less an uninterrupted ancestry leading to later peoples of the island.

If the Castlepook mark records human work, the smallest defensible scenario is a brief encounter between people and animal resources in a suitable part of the landscape. A hunting party may have exploited a carcass or killed an animal; equally, the evidence is too slight to establish the scale and circumstances of the action. Such an episode would have required knowledge, mobility and survival skills, but those are inferences from the wider Upper Palaeolithic world rather than observed Irish artefacts. Subsequent ice advance also probably removed, buried or reworked many exposed land surfaces. This helps explain why traces may be scarce, but absence of surviving evidence cannot itself prove either population or complete abandonment.

No Politics, No Proven Trade

Political affairs, diplomacy and organised conflict cannot be recovered for Ireland at this point. There are no texts, monuments, weapons assemblages or settlement plans from which to identify polities, leaders, territorial boundaries or alliances. Nor is there evidence for farming, herding, metalworking, pottery, exchange institutions or long-distance trade based in Ireland. The relevant economy, if people were present, would have been one of immediate subsistence: movement through difficult country, use of animal and plant resources, and perhaps episodic hunting or carcass processing.

Religion and learning are similarly beyond direct recovery. It would be wrong to project the rich ritual evidence of much later prehistoric Ireland—tombs, ceremonial landscapes, metal deposits and inscribed objects—back across more than twenty-five thousand years. People elsewhere in Upper Palaeolithic Europe clearly possessed symbolic capacities and cultural traditions, but no Irish object from this horizon demonstrates a particular belief, rite, artistic practice or system of knowledge. The caves preserve animal and geological evidence, not an identifiable Palaeolithic religion.

What This Date Can Mean

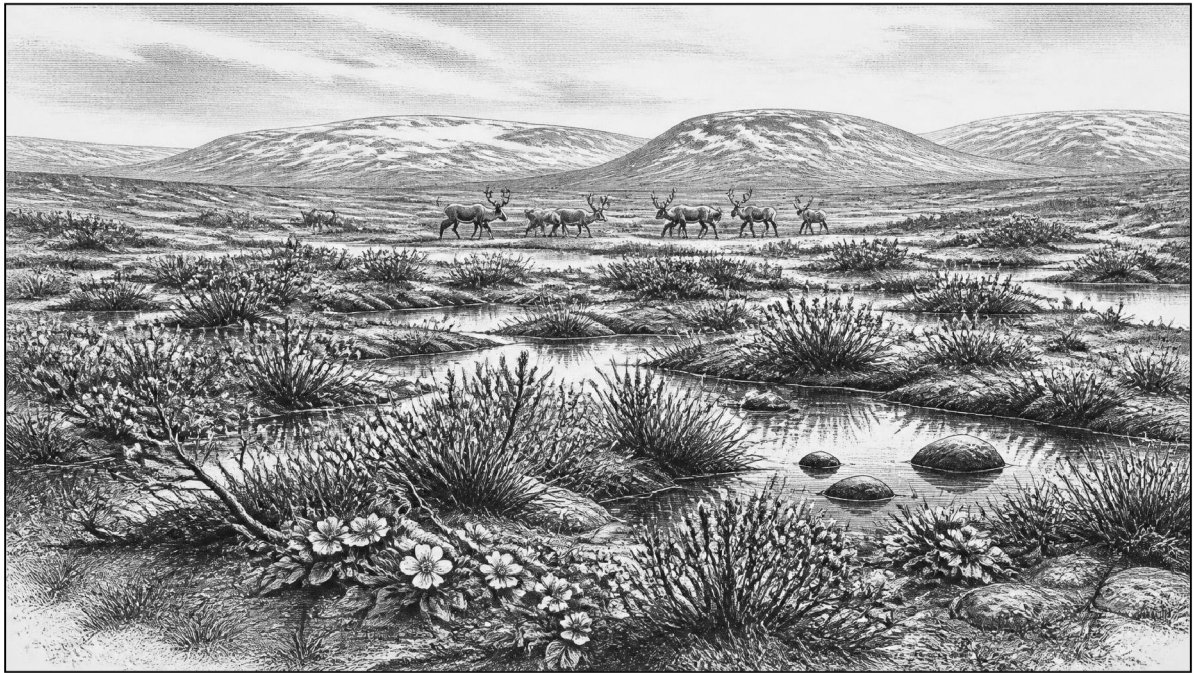
The historical importance of this horizon lies not in a year-specific event but in the possibility that Ireland was intermittently part of a wider north-west European human and animal world before the last great ice expansion. Derryvree shows cold freshwater tundra conditions in one part of the island; Castlepook preserves a remarkable succession of cold-stage mammals in another; the reindeer femur raises, but does not settle, the question of an early human visit. The later Last Glacial Maximum transformed these landscapes and greatly reduced the odds that open-air evidence would survive.

For 31,188 BCE, then, Ireland should be imagined neither as a documented homeland nor as a blank on the map. It was a changing Pleistocene landscape with wetlands, open vegetation, large herbivores and predators, subject to advancing ice and severe seasonal constraints. A possible human action at Castlepook remains provocative precisely because the record is so sparse. The honest history is one of evidence carefully separated from interpretation: animals are securely present; particular environments are demonstrably recorded; a human visit is plausible but not yet represented by a conventional archaeological site; and calendar-year precision is unavailable.

Chapter 014 of 100

31187 BCE

Mammoth Cave Hindleg^[14]



The label 31,187 BCE is a modern point on a calendar, not a year that can be recovered from Ireland's prehistoric record. No annals, named communities, rulers, settlements or events exist for it. At this depth of time, the responsible unit of history is a broad, calibrated archaeological and environmental interval. The date falls at about 33,100 years before AD 1950, during the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), when North Atlantic climates altered sharply over millennia and sometimes much more quickly. Ireland was not yet the familiar green, wooded island of later prehistory. Its evidence is fragmentary: sediments sealed beneath ice deposits, cave bones, fossils, landforms and a single particularly provocative reindeer bone from north Cork.

A Calendar Point, Not a Chronicle

Modern calendar precision should not be mistaken for prehistoric precision. Radiocarbon years are not calendar years: the amount of atmospheric carbon-14 has varied, so laboratory measurements must be calibrated against internationally revised curves. Beyond 30,000 years ago, calibrated results commonly span centuries or millennia. The value of the date 31,187 BCE is therefore positional. It directs attention to a late MIS 3 horizon, rather than identifying an Irish spring, a particular hunt or an individual life. Even the most relevant Irish deposits may begin or end well away from this notional year.

This was also a changing world rather than a single uniform "Ice Age". MIS 3, conventionally extending roughly from 57,000 to 29,000 years ago, was marked by repeated cold stadials and relatively milder interstadials. Those shifts affected temperature, vegetation, ice growth, sea level and the routes available to animals. Ireland lay on the north-western edge of Europe, exposed to Atlantic weather systems and increasingly affected by the growth of the British-Irish Ice Sheet. It is inappropriate,

however, to imagine the whole island under one unchanging blanket of ice in 31,187 BCE. Different regions could have had markedly different conditions, and the chronology of ice expansion remains an active research field.

Derryvree Between the Tills

The strongest Irish environmental evidence close to this broad horizon comes from Derryvree near Maguiresbridge, County Fermanagh. Roadworks exposed organic-rich freshwater silts and fine sands trapped between two tills: unsorted sediment laid down by glacier ice. The sequence supplies a secure relative order. Ice had previously crossed the locality; afterwards, ice was absent locally long enough for freshwater deposits, plants and small animals to accumulate; then a renewed glacial advance covered the evidence with fresh till. This is not proof of an ice-free Ireland in every direction, but it is compelling evidence of an ice-free interval at Derryvree.

The organic material, known as BIRM-166, produced a conventional radiocarbon age of about 30,500 $\pm$ 1,200 radiocarbon years before present. Published calibrations place it broadly between about 36,900 and 31,700 calibrated years before present. Thus 31,187 BCE lies near, but not securely inside, the younger edge of this substantial range depending on the conversion used; it cannot be assigned to a particular bed, plant, insect or season. The useful conclusion is environmental rather than annual: north-central Ireland had experienced a cold but locally non-glacial phase before the major later expansion of the last Irish ice sheet.

Derryvree's fossils suggest an open, treeless and wet landscape. Plant remains associated with cold conditions, including bogbean, mountain-avens and lesser clubmoss, point to tundra-like or muskeg environments with pools, sedges and saturated ground. Such evidence does not permit a precise reconstruction of annual temperatures, yet it decisively rules out the later Irish landscape of dense temperate woodland, fields and enclosed farms. Seasonal freezing and thawing would have shaped soils and watercourses. In sheltered hollows, summer growth could be surprisingly productive; across exposed ground, wind, frost and sparse vegetation would have dominated.

The Reindeer Bone at Castlepook

County Cork provides the most arresting, though more contested, evidence relevant to human history. Castlepook Cave, also known as Mammoth Cave or Doneraile Cave, near Doneraile, has yielded Ireland's richest known Late Pleistocene vertebrate assemblage. Its bones include reindeer, brown bear, wolf, fox, hare, lemmings, spotted hyaena, giant deer and woolly mammoth. Cave deposits are not straightforward domestic rubbish: carnivores may have dragged carcasses inside, animals may have died naturally, water may have moved material, and many earlier finds were recovered before modern excavation standards. Each specimen must therefore be assessed in its own context.

A reindeer femur from Castlepook has special importance because it bears a deep mark interpreted by zooarchaeologist Ruth Carden as having been made on fresh bone with a sharp stone implement during carcass processing. Public accounts have connected the specimen with an age of about 33,000 years ago. If that interpretation is sustained, it would be Ireland's earliest known indication of human activity by a very large margin. But evidence and interpretation must remain separate. The bone may date the animal's death, while the diagnosis and timing of the incision are distinct questions; no securely associated hearth, stone-tool assemblage, dwelling floor, burial or repeated occupation surface has yet established a settled Palaeolithic community in Ireland.

The safest conclusion is significant but limited. Around this broader period, reindeer moved through or lived in southern Ireland, and one specimen may preserve evidence that a person used a stone tool on its carcass. That would imply practical knowledge of animal anatomy, cutting implements and food processing. It does not demonstrate a permanent camp at Castlepook, a population size, a language, ancestry, named migration route or continuous occupation of the island. Nor can it identify the people involved as a particular archaeological culture merely by comparison with Upper Palaeolithic groups elsewhere in Europe.

Society Without Institutions

There is no evidence for political affairs, diplomacy, formal leadership, territorial states or organised warfare in Ireland at this time. Such categories require records that the island does not preserve. If humans were present, the plausible social scale is small, mobile foraging parties rather than villages or polities. Reindeer would have supplied meat, marrow, hide, sinew and bone, while other animals offered opportunities and dangers. That reconstruction is an inference from the possible butchery evidence and from wider Upper Palaeolithic practices, not a directly excavated Irish campsite.

For the same reason, religion, art, language, learning and trade cannot be described as specifically Irish realities in 31,187 BCE. No Irish ritual site, grave, figurative art, ornament or exchange network of this age is securely known. People elsewhere in Europe made complex tools and art during the Upper Palaeolithic, but proximity is not evidence of contact. The absence of such finds in Ireland may reflect both a genuinely sparse human presence and the destructive effects of later glaciation, which eroded or buried older landscapes. It is more accurate to say that the record is silent than to populate it with imagined hunters, shamans or clans.

A Landscape on the Edge of Ice

Environmental change was the central historical force. The Derryvree sequence shows that ice margins advanced and retreated through time; later evidence indicates that the last Irish ice sheet grew extensively after about 34,000 years ago and reached its maximum extent much later, broadly between 27,000 and 23,000 calibrated years before present. At its maximum, ice covered Ireland and extended onto surrounding shelves, but that later outcome should not be projected backwards as a condition already complete in 31,187 BCE.

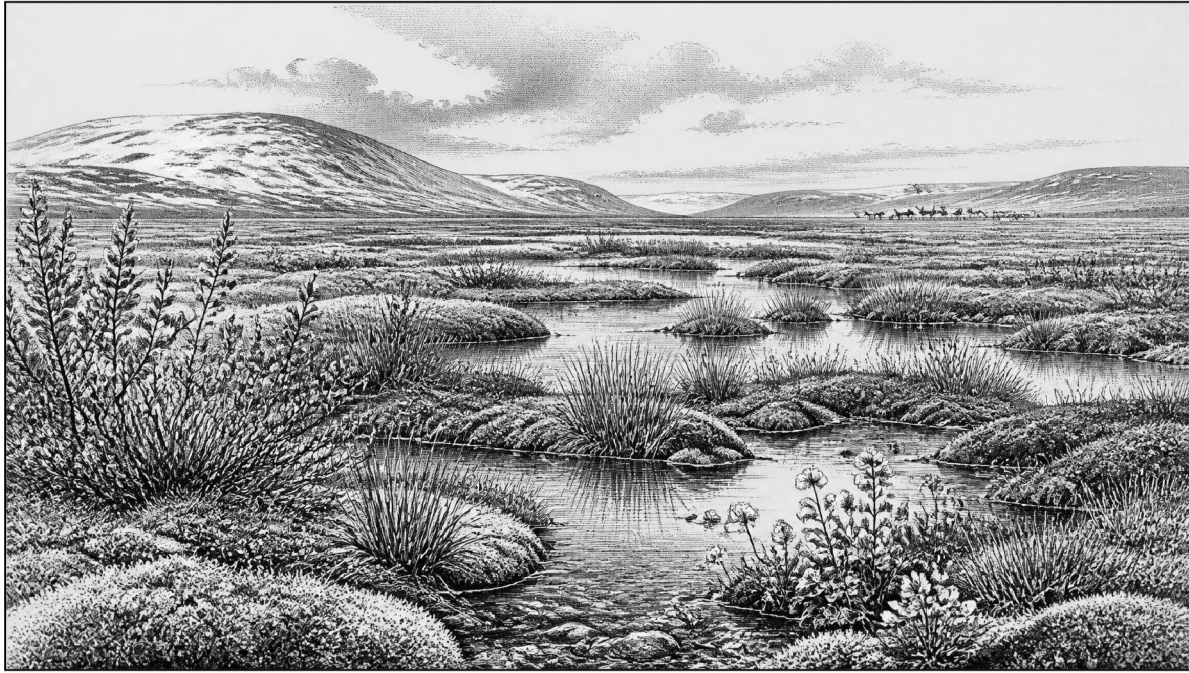
Lower global sea level changed the shape of surrounding coasts, although it did not automatically create an easy land bridge from Ireland to Britain. The geography of the Irish Sea was controlled by fluctuating sea level, isostatic movement of the land and ice-sheet behaviour. Any movement of animals or people into Ireland had to be understood within that changing palaeogeography, perhaps across exposed lowlands, ice-connected terrain, shallow channels or short sea crossings at different times. Present evidence does not permit a confident route for the possible Castlepook visitors.

For Ireland around 31,187 BCE, then, the most important development was neither a kingdom nor a battle but the unstable relationship between cold, water, animals and ice. Fermanagh preserves a freshwater tundra interval sealed between glaciers. Cork preserves a cave fauna, including a reindeer femur that may carry the trace of a human tool. Together they make this a threshold in Irish deep history: a period in which life was possible in some places, but in which the evidence for people remains tantalisingly slight and the advancing ice would later erase much of what once existed.

Chapter 015 of 100

31186 BCE

Derryvree's Three-Leaved Fossil^[15]



31,186 BCE is a modern calendar label applied to a time far beyond any Irish written record. It cannot identify a known event, ruler, journey or single season. Around this point—roughly 33,100 calibrated years before present, using 1950 as the archaeological reference point—Ireland lay within the Late Pleistocene, during Marine Isotope Stage 3, a climatically volatile part of the last Ice Age. The responsible history of the island is therefore not a year-by-year narrative in the usual sense. It is a reconstruction from sediments, fossils, cave deposits and dating ranges, with clear boundaries between what the evidence demonstrates and what it only suggests.

A Date Within a Wide Range

The most useful Irish evidence close to this notional year comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin—a streamlined hill shaped by glacial ice—and exposed an exceptional sequence. Freshwater silts and fine sands, rich in organic remains, lay between two deposits of till, the stony, unsorted sediment left by glaciers. The order is secure: ice had affected the locality; an interval followed in which freshwater sediment, plants and small animals accumulated; later ice overrode or buried the deposit.

Organic material from the Derryvree bed produced a conventional radiocarbon age of 30,500 years before present, with a substantial uncertainty of +1,170 and -1,030 years. Radiocarbon years are not equivalent to calendar years, particularly this far back. Calibration has placed the deposit broadly at about 36,900–31,700 calibrated years before present, approximately 34,950–29,750 BCE. Thus 31,186 BCE falls within the possible span of the deposit, but it cannot be assigned to a particular layer, plant, animal or day. Derryvree is an archive accumulated over time, not a diary from a precisely dated year.

Fresh Water Between Glacial Advances

The Derryvree sequence is important because it shows that this part of Fermanagh was ice-free at some point during the broad dated interval. It does *not* prove that all Ireland was free of ice at once, nor that ice margins stood still. The Late Pleistocene climate shifted sharply on scales of centuries and millennia. Glaciers could advance, thin, retreat and reorganise, while local conditions in lowlands, uplands and coastal basins differed markedly. Later glaciation also destroyed or concealed much earlier evidence, which is one reason the Irish record is sparse.

At Derryvree, however, the inter-till silts preserve a cold freshwater setting. Their pollen, plant macrofossils, mosses and insect remains indicate open tundra vegetation and a periglacial climate: ground strongly affected by frost, with short growing seasons and little or no woodland. This was not the oak-and-hazel island familiar from later prehistory. It was a treeless or nearly treeless mosaic of wet hollows, shallow water, sedges, mossy ground, herb-rich patches and exposed mineral soils.

The Three-Leaved Plant

One modest fossil gives the title its meaning. Derryvree produced a seed of bogbean, *Menyanthes trifoliata*, a plant recognised by its three-part leaf and associated with wet ground and freshwater margins. Other remains include dwarf willow, mountain avens and aquatic plant evidence. Together, these finds do not recreate every species on the ground at a particular moment, but they firmly support the existence of cold-adapted vegetation around pools and marshy ground. Moss assemblages are especially valuable because they retain environmental information often absent from the visibly dramatic record of bones and boulders.

The resulting landscape is sometimes described as tundra or muskeg-like wetland. Such comparisons should be used carefully: Ireland's topography, Atlantic position and changing ice cover made its environment distinctive. Yet the evidence supports an open, frost-influenced place where freshwater was persistent enough for aquatic and wetland plants, while surrounding terrain remained cold, windswept and sparsely vegetated. Seasonal thaw would have mattered greatly. Meltwater, frozen ground and the brief productive summer were probably more decisive ecological forces than any stable annual climate.

Animals on a Changing Island

Caves, particularly Castlepook Cave near Doneraile in north County Cork, provide a different form of evidence. Their old collections contain remains attributed to mammoth, reindeer, giant deer, brown bear, arctic fox, hare, lemmings, wolf and spotted hyaena. These animals were not necessarily contemporaries, and a cave deposit is not a census of a single local landscape. Carnivores may have dragged bones into dens; water, collapse and early excavations may have mixed material; and individual specimens can be separated by many thousands of years. Recent reassessment has also shown why older radiocarbon results require caution, especially where modern pretreatment methods were unavailable.

Nevertheless, the combined record establishes an important point: before the Last Glacial Maximum, Ireland could support a far richer large-mammal fauna than the island's later, more isolated Holocene fauna might imply. Reindeer and other grazing animals would have fitted open vegetation, while predators and scavengers occupied the same broad food web. Mammoth and giant deer remains are powerful evidence for the reach of this north-west European faunal world, but they do not prove that either animal stood at Derryvree in 31,186 BCE.

The Castlepook Human Question

A reindeer femur from Castlepook has been reported as bearing a deep mark interpreted by zooarchaeologist Ruth Carden as damage made during butchery with a stone tool. Public heritage accounts associate the bone with an age of around 33,000 years ago, broadly close to the period considered here. If the mark is confirmed as human-made and contemporaneous with the animal's death, it would be exceptionally early evidence that people entered Ireland and processed reindeer during the Upper Palaeolithic.

That conditional language is essential. The specimen came from an old cave collection, not a modern excavation of an intact occupation floor. The radiocarbon determination dates the animal bone, not a named human action or the duration of any visit. No securely associated hearth, stone-tool assemblage, dwelling surface, burial, repeated butchery area or settlement has yet demonstrated a community in Ireland at this age. The most defensible interpretation is that a brief hunter-gatherer incursion is possible; permanent occupation, continuous population and a route of arrival remain unproven.

No Kingdoms, No Recorded Wars

There is no evidence from Ireland around 31,186 BCE for political institutions, named peoples, chiefs, diplomacy, warfare, law or territorial states. Equally, there is no Irish evidence for farming, herding, pottery, monuments, formal trade networks, literacy, religion expressed in ritual structures, or artistic traditions comparable to those known elsewhere in Upper Palaeolithic Europe. It would be misleading to fill these silences by importing cave art, burial rites or tool industries from France, Iberia or central Europe. Those regions offer context for what human groups elsewhere could do; they are not proof that the same practices occurred in Ireland.

If people did reach the island, their everyday economy would most plausibly have involved mobile foraging, with large animals such as reindeer a potential resource. But even that is an inference from a single contested-looking line of evidence, not a securely documented Irish livelihood. There is no basis for describing a settlement hierarchy, exchange system, household pattern or religious life. The political and cultural history of this date is therefore chiefly a history of absence: not proof that human societies could not have been present, but proof that the surviving Irish record cannot yet demonstrate them.

Regional Change Before the Great Ice

The wider significance of this period lies in change. The Derryvree bed records an interval when freshwater life occupied ground later sealed beneath ice. Castlepook's fauna indicates that animals moved through, or lived within, ecological connections extending beyond the modern island. Lower sea levels altered the surrounding shelf, but changing coastlines and ice conditions cannot be reduced to a simple, proven land-bridge story for a particular year. Movement may have been possible at some times and difficult at others; the relevant evidence remains incomplete.

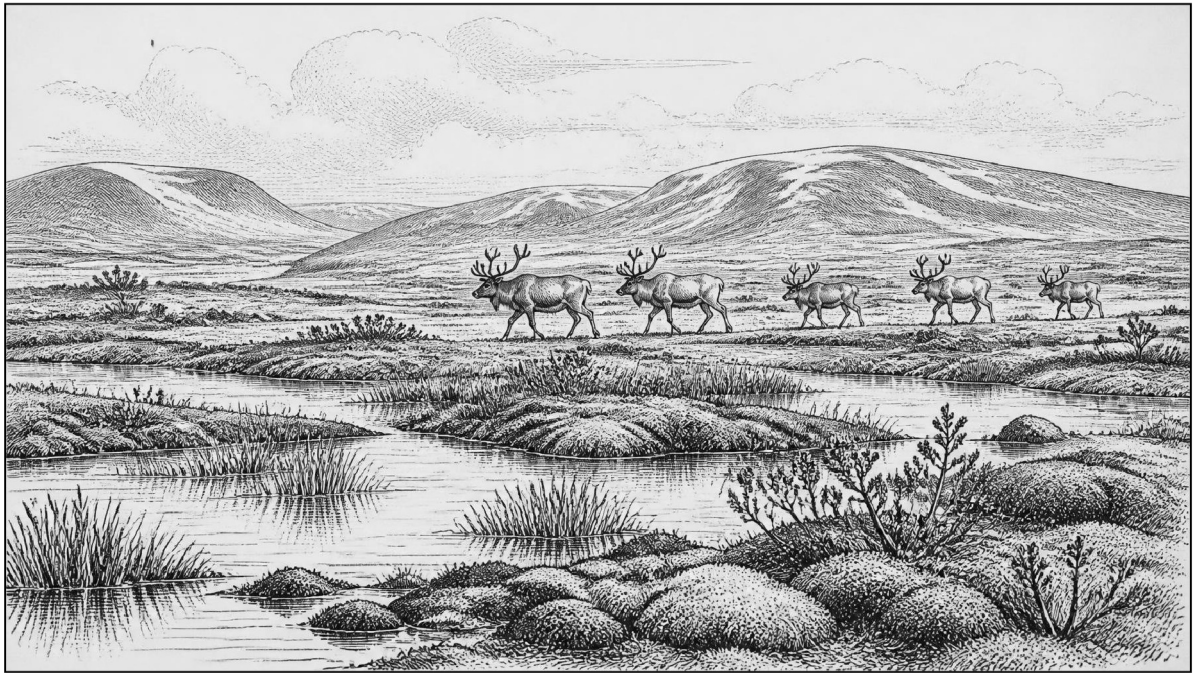
Within several millennia, the Last Glacial Maximum would bring much more extensive ice to Ireland and its surrounding shelf, eroding landscapes and restricting habitats. For 31,186 BCE, however, Derryvree preserves a different image: cold water under an open sky, bogbean and dwarf willow at a marsh edge, insects and mosses surviving a severe climate, and a landscape not yet reduced to the later

maximum of ice cover. That small fossil seed is not a symbol of a lost nation or a known human community. It is stronger evidence than that: a direct trace of Irish life in deep time, precisely because it tells us only what it can.

Chapter 016 of 100

31185 BCE

BIRM-166's Intertill Testimony^[16]



“31,185 BCE” is a useful modern filing label, not a date that can be recovered from the Irish archaeological record with calendar-year precision. At this depth of time, evidence is dated in radiocarbon years, calibrated ranges and broad climatic stages; those measures carry substantial uncertainty. The year corresponds roughly to 33,134 years before AD 1950, but it would be misleading to claim that an identifiable event happened in Ireland during that particular twelve-month span. The responsible subject is therefore Ireland in the later part of Marine Isotope Stage 3, close to the transition towards the much colder conditions of the Last Glacial Maximum. The evidence permits a picture of unstable Ice-Age environments, animal movements and a tantalising but unconfirmed indication of human activity; it does not permit a conventional political or biographical history.

A Landscape Before Maximum Ice

Ireland was then within the Midlandian cold stage, the last great glacial cycle in Irish geological terminology. It was not yet necessarily the fully ice-covered island familiar from reconstructions of the Last Glacial Maximum, whose maximum expansion is generally placed much later, around 27,000–23,000 calibrated years ago. The pre-maximum history remains difficult to reconstruct: ice sheets could advance, thin, fragment and re-form in response to abrupt North Atlantic climatic shifts, while conditions differed sharply between uplands, lowlands, coasts and the surrounding seas. It is consequently unsafe to draw a single ice margin across the whole island for 31,185 BCE. What can be said is that parts of Ireland preserved evidence for ice-free or seasonally exposed ground during this broader interval, before later glaciation overran and transformed much of the landscape.

Lower global sea levels altered coastlines and shallow seas, but this does not provide a simple answer to the question of access. The geography between Ireland, Britain and continental Europe changed repeatedly, and ice, water, tidal channels and exposed shelves would all have affected movement. No securely dated route, crossing point or settlement trail survives from this time. It is better to imagine Ireland as a western fringe of north-west Europe: potentially reachable during favourable circumstances, but environmentally demanding and repeatedly disrupted by glacial change.

Derryvree's Wet Ground

The strongest direct environmental archive relevant to this period lies at Derryvree near Maguiresbridge, County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed freshwater silts and fine sands trapped between two substantial till sheets. That sequence is important because it establishes a relative order: glaciation had occurred, an ice-free freshwater environment subsequently existed at the site, and renewed ice later deposited another till. The organic sediments produced the conventional radiocarbon determination Birm-166, 30,500 radiocarbon years BP, with a large published uncertainty. Subsequent discussion and calibration place the deposit broadly within the later Middle Midlandian, rather than allowing it to be treated as a precisely dated annual horizon.

Derryvree preserves the remains of a cold freshwater and wetland environment. Plant pollen, seeds, mosses and insect evidence point towards treeless tundra or muskeg: waterlogged ground, shallow pools, sedges and herbs, with sparse vegetation beyond the wettest places. Finds include species associated with cold, open conditions, such as mountain-avens and Arctic-alpine plants, while a fossil seed of bogbean demonstrates that pools and marshy margins could support aquatic vegetation. These remains do not mean that every Irish valley looked identical. They do, however, replace an older image of an entirely sterile frozen Ireland with a more varied picture of wet ground that sustained plant and invertebrate life during a harsh periglacial phase.

The Derryvree evidence also explains why survival, for animals and any visiting people, would have depended upon season, locality and mobility. A wetland rich in plant matter could provide summer forage and attract insects, small mammals and herbivores; its value in winter would have been very different. Frost action, snow cover, wind exposure and short growing seasons constrained the landscape. There is no evidence for fields, livestock, permanent houses or woodland management. This was not an agricultural countryside awaiting farmers, but a changing cold-stage mosaic in which productive patches were limited and seasonal.

Castlepook's Animal Archive

In north County Cork, Castlepook Cave in the Awbeg Valley offers a different kind of evidence. The cave system has yielded Ireland's richest known pre-Last Glacial Maximum faunal assemblage, including woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena. Such a list should not be read as a single living community observed on one day. Cave deposits accumulate through many episodes: animals may die naturally, carnivores may carry prey or bones underground, water may move remains, and earlier excavations may disturb their original positions. Nevertheless, the assemblage confirms that large herbivores and cold-adapted species reached parts of Ireland during the wider pre-maximum interval, accompanied by formidable predators and scavengers.

This animal record has major implications for the island's food web, but not for a settled human economy. Reindeer and horse-like open-country grazers could have exploited sparse vegetation; mammoths and giant deer belong to a broader northern European Ice-Age fauna; hyaenas, wolves and bears remind us that carcasses were contested resources. Cave use by carnivores is especially significant. It cautions against assuming that every bone represents human hunting, and it helps explain why Castlepook is both extraordinarily valuable and difficult to interpret. The cave is an archive of animal presence and bone accumulation, not a preserved village floor.

The Human Question

Castlepook matters to Irish human history because a reindeer femur from older collections has been reported as carrying a deep mark interpreted as having been made by a sharp stone tool while the bone was fresh. The bone has been publicised as approximately 33,000 years old, broadly near this article's chronological horizon. If the mark is confirmed as anthropogenic, it would show that people processed a reindeer in Ireland far earlier than the better-established terminal Pleistocene evidence from County Clare. It would be a remarkable discovery, but its force must be kept proportional to the evidence: one modified bone is not a settlement, a camp, a population estimate or proof of continuous occupation.

Nor can the femur, even if the cut-mark interpretation stands, identify its makers by name, language, ancestry or political affiliation. There are no human burials, unquestioned stone-tool assemblages, hearths, dwellings or stratified occupation surfaces securely tied to this moment in Ireland. The responsible conclusion is modest: Ireland may have been visited by highly mobile Upper Palaeolithic hunter-gatherers, perhaps during a favourable window in a cold but biologically productive landscape. That is an interpretation based on the bone and on wider European comparison, not a demonstrated Irish society. Claims of tribes, chiefs, territorial boundaries or diplomatic relations would be inventions.

Political affairs and warfare are therefore beyond recovery. There is no evidence for government, collective institutions, alliances or organised conflict on the island. The same restraint applies to religion, art and formal learning. Caves later acquired many symbolic associations in human societies, but Castlepook's known Ice-Age deposits cannot responsibly be presented as a shrine or ritual site. Any people who reached Ireland would necessarily have possessed sophisticated practical knowledge: how to travel through a severe climate, make and maintain tools, read animal behaviour and share skills within a group. Yet these are reasonable inferences about mobile foragers, not direct evidence for particular Irish customs or beliefs.

Exchange, Settlement and Absence

There is likewise no basis for describing trade. No imported ornaments, worked raw materials, exchange routes or specialised production areas are known from Ireland around this horizon. The most plausible economic activity, if people were present, was immediate acquisition and processing of animal and plant resources. Reindeer meat, marrow, hides, sinew and bone would have been useful, but Castlepook has not yielded the secure associated evidence needed to show how a carcass was divided, transported or shared. The possible incision on one femur is a clue to an action, not a record of an entire subsistence system.

Settlement evidence is absent partly because any human presence may have been fleeting, but also because later ice was destructive. Expanding ice sheets eroded bedrock and sediment, redeposited material as till, and reshaped river valleys and lowlands. Rising post-glacial seas later drowned former coastal

plains. These processes reduce the likelihood that open-air camps of this age would survive or be easily recognised. The scarcity of evidence is therefore historically meaningful but not equivalent to proof that no person ever entered Ireland. Archaeology records survival as well as past behaviour.

An Iceward Horizon

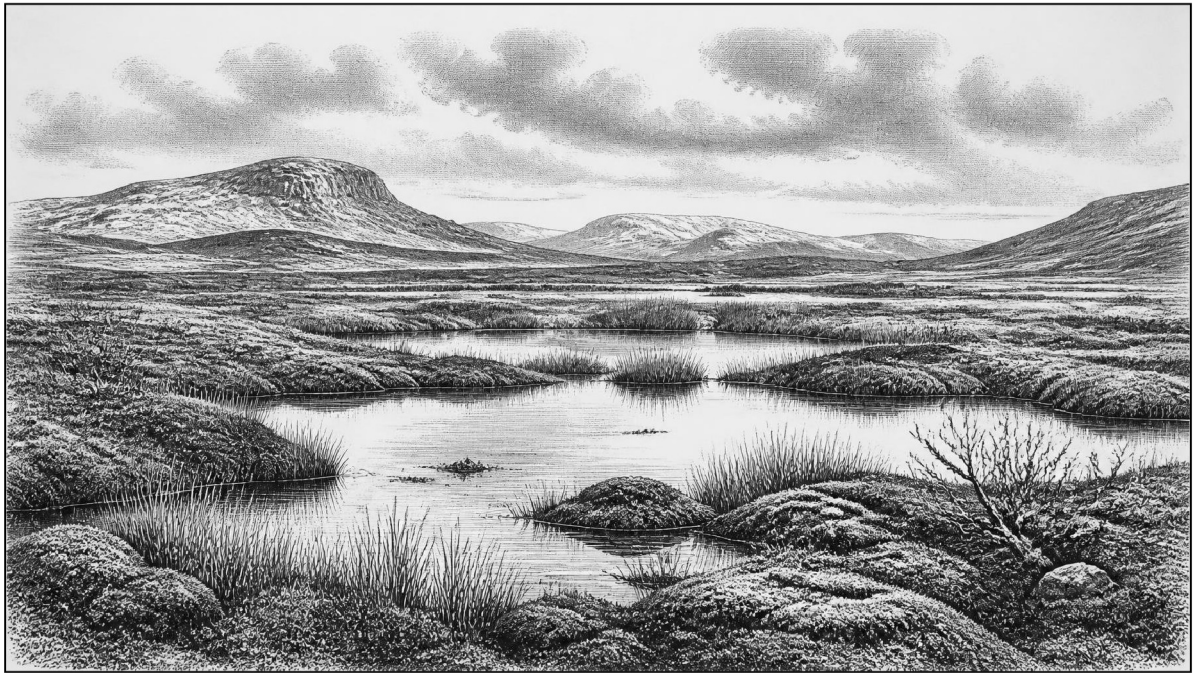
At the scale of centuries and millennia, the dominant development was environmental instability leading towards greater glaciation. Research on the British–Irish Ice Sheet indicates that large-scale build-up followed the later parts of MIS 3 and culminated well after this approximate date. Ireland’s habitable patches contracted or were transformed as ice expanded, while the later Last Glacial Maximum erased or buried much of what had existed before. Derryvree’s freshwater deposits, sealed between tills, are therefore precious precisely because they preserve a short-lived environmental interval otherwise lost from the visible landscape.

The Ireland of roughly 31,185 BCE was thus neither a named nation nor an empty white void. It was a cold, open and locally wet Ice-Age landscape, inhabited by resilient plants and animals and shaped by advancing and retreating ice. Castlepook offers a compelling possible signal of people handling a reindeer; Derryvree gives firmer evidence for the wet tundra setting in which life persisted. The distinction matters. The environmental record is substantial, the faunal record is valuable, and the human story remains a carefully framed possibility rather than a complete chapter of settlement history.

Chapter 017 of 100

31184 BCE

Maguirebridge's Moss-Rich Interval^[17]



Modern calendar-year precision does not exist for Ireland in 31,184 BCE. No community in Ireland named a year, left writing, or produced an archaeological sequence that can identify a particular season, individual or event at this point in deep time. The date is a modern label: it corresponds approximately to 33,134 years before AD 1950, the conventional ‘present’ used in radiocarbon chronology. What can be responsibly said is broader, but still revealing. Ireland was in the Late Pleistocene, within Marine Isotope Stage 3, during the long climatic deterioration that preceded the Last Glacial Maximum. The strongest Irish evidence relevant to this date comes not from a settlement but from a buried wetland at Derryvree, near Maguiresbridge in County Fermanagh.

A Date Within a Range

The key Derryvree deposit lay between two sheets of glacial till in a drumlin exposed during road works in 1969. Its organic-rich freshwater silts and fine sands produced a conventional radiocarbon determination of 30,500 $\pm$ 1,170/–1,030 radiocarbon years BP. Later discussions have expressed this evidence as an approximate calibrated range of c. 36,900–31,700 cal BP. Converted only roughly into BCE terms, that spans about 34,950–29,750 BCE. Thus 31,184 BCE falls within the broad chronological window illuminated by the deposit, but it cannot be pinned to a particular layer, pool, plant or animal.

This distinction matters. Radiocarbon ages are measurements with uncertainties; calibration translates them into calendar estimates by comparison with independently dated records. At more than thirty millennia ago, the ranges are necessarily wide. The Derryvree sequence is therefore evidence for a cold environmental phase lasting over millennia, not a diary entry for one numbered year. Its importance lies precisely in what it preserves: a rare Irish record of freshwater life and tundra vegetation during an interval between episodes of glaciation.

Fresh Water Between Ice Advances

At Derryvree, an earlier till lay below the wetland sediments and a later till sealed them above. The straightforward geological conclusion is that ice had affected the district before the organic mud accumulated and did so again afterwards. Between those advances, however, the immediate locality supported standing or slowly moving fresh water, wet ground and enough plant growth to build an organic record. Mosses, sedges, herb pollen and cold-adapted insect remains were recovered from the deposit. Together they point to an open, treeless, wet tundra or muskeg landscape under periglacial conditions.

That description should not be mistaken for a claim that all Ireland looked identical. A single buried basin records a local setting, shaped by water, sediment and shelter as well as climate. It does, nonetheless, correct the misleading image of an island that was either continuously ice-covered or universally barren. Around the period represented by Derryvree, parts of north-central Ireland could contain marshes, shallow pools and vegetated ground, even in a severe cold-stage environment. The wetland plants and insects are direct evidence; the reconstruction of a wider mosaic of damp hollows, exposed mineral ground and sparse herb cover is a well-supported interpretation.

The flora suggests no closed woodland. A few pollen grains from trees can be reworked from older deposits or transported over long distances, whereas the wider assemblage is dominated by herbs and cryptogams suited to low vegetation cover. Sedges indicate wet soils and waterside habitats. Mosses are especially valuable because they provide a more local signal than wind-borne tree pollen. Some taxa associated with Derryvree have modern northern or alpine distributions, reinforcing the case for a cold climate. Yet the presence of freshwater organisms also shows that this was not an unbroken desert of snow and ice: seasonal thaw and liquid water mattered.

An Island Entering a Colder Phase

Irish ice-sheet history at this age is debated, because deposits have often been destroyed, redeposited or buried by later ice. The evidence does not permit a single confidently drawn coastline-to-coastline ice margin for 31,184 BCE. In north-central Ireland, Derryvree and other Fermanagh inter-till deposits demonstrate non-glacial conditions before later ice expansion. A synthesis of dating evidence has accordingly argued that much of the last Irish Ice Sheet grew from relatively limited cover after about 34,000 years ago.

Large-scale British–Irish Ice Sheet reconstructions add an important caution. Their modelled snapshots begin at 31,000 years BP, later than the modern BCE date in question, and indicate substantial ice accumulation in northern Ireland by that point, with expanding ice elsewhere across the island thereafter. These reconstructions are sophisticated combinations of landforms, offshore sediments, dates and ice-flow modelling, but their early margins remain less certain than those of the later glacial maximum. The responsible picture for c. 33,100 cal BP is therefore one of rapid regional change: cold, mostly open landscapes in some lowlands; ice or local glaciers in some uplands; and a major ice-sheet build-up approaching rather than a completed island-wide maximum.

The later Last Glacial Maximum should not be projected backwards wholesale. Its broad maximum in Ireland and the surrounding seas came thousands of years after the Derryvree interval, broadly around 26,000–20,000 years BP, although timing and extent varied by region. At 31,184 BCE, sea level was lower than today and coastlines differed, but Ireland's precise connections, shorelines and travel routes cannot be reconstructed confidently enough to narrate a particular crossing or migration. Lower seas exposed more continental shelf, while glaciers and cold seas transformed the surrounding region.

Animals and a Fragmentary Faunal Record

Southern Irish caves, especially Castlepook Cave near Doneraile in County Cork, demonstrate that Ireland supported a much richer Pleistocene fauna than the modern island. The cave assemblage has included remains attributed to reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. These animals belong to cold, open environments rather than forests. Reindeer and lemmings, in particular, accord broadly with the kind of tundra conditions indicated by the Fermanagh wetland record.

But Castlepook is not a census for 31,184 BCE. Cave deposits can combine material accumulated over long intervals, scavenged carcasses and bones disturbed by excavation or later processes. Improved radiocarbon methods have also shown that several earlier dates for southern Irish cave fauna were too young. The careful conclusion is that these remains establish a Late Pleistocene animal world in Ireland during Marine Isotope Stage 3; they do not demonstrate that every listed species lived together at Derryvree, or that any one species can be assigned to this exact modern year.

People: What Cannot Be Claimed

No secure human camp, hearth, tool assemblage, burial or artwork is known in Ireland from around 31,184 BCE. This absence is especially significant because it rules out the familiar language of settlement, tribal leadership, warfare, diplomacy, trade and religion. There is no evidence for an Irish polity, community, exchange network, ritual site or learned tradition at this date. Nor is there evidence from which to reconstruct houses, clothing, food preparation or family life in Ireland itself.

Europe certainly contained Upper Palaeolithic hunter-gatherer populations at the time, and the animal landscapes of Ireland were not beyond the reach of wider north-west European ecological change. That fact makes human visits conceivable in the abstract, but possibility is not proof. Ireland's earliest currently accepted direct indication of human activity is vastly later: a butchered brown-bear patella from Alice and Gwendoline Cave in County Clare, radiocarbon dated to c. 12,810–12,590 cal BP. It cannot be used to populate Ireland more than twenty thousand years earlier.

Claims sometimes made for very early human modification of Irish animal bone must likewise be treated cautiously unless supported by secure stratigraphy, dating and diagnostic marks. A cut or groove on a bone can prompt investigation, but one object cannot create a settled human history. At 31,184 BCE, the evidence supports an environmental history rather than a social narrative. If people did reach Ireland during this cold phase, their traces have not yet been securely identified.

Nature as the Historical Record

For this period, environment is not background to history; it is the history that survives. The Derryvree silts record water, vegetation, insects and cold; the enclosing tills record the power of later moving ice; cave bones record the intermittent presence of animals adapted to open northern habitats. These sources also reveal regional difference. Fermanagh's damp lowland basin, Cork's limestone cave country and the growing ice centres of the uplands belonged to one changing island, but did not preserve the same evidence or experience identical conditions.

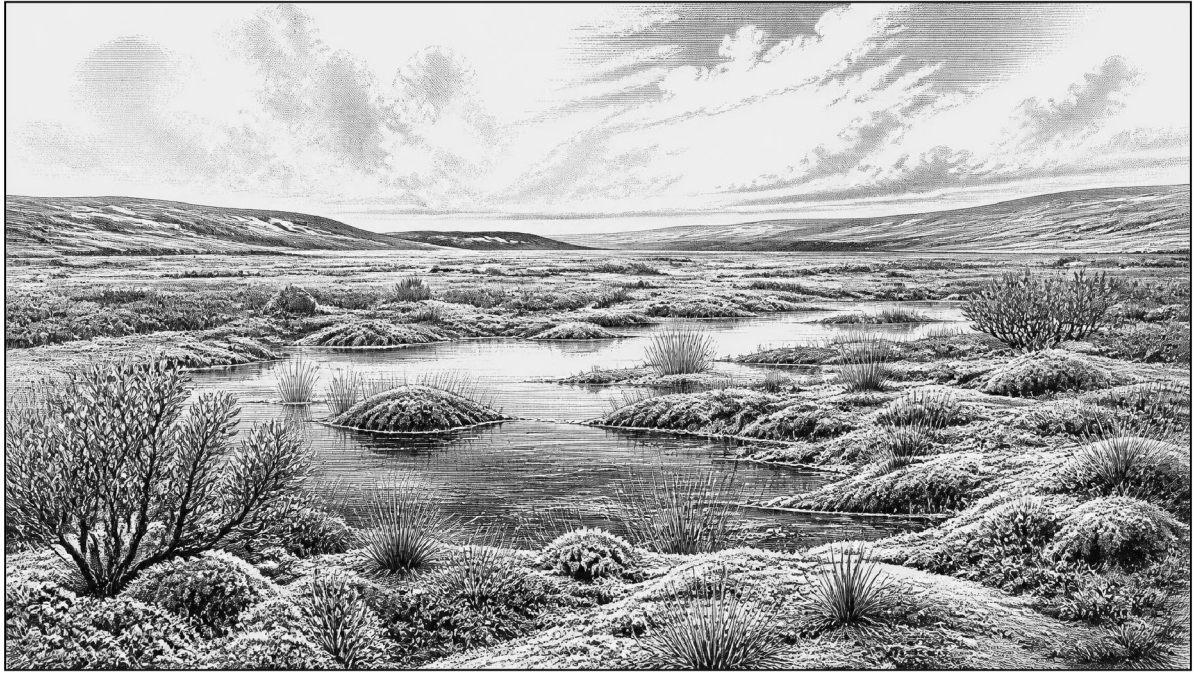
The most important development around 31,184 BCE was therefore neither a battle nor a dynasty, but an unstable climatic threshold. Ireland retained patches of freshwater tundra landscape while the processes that would build the later Irish Ice Sheet were intensifying. The mosses and sedges beneath a Fermanagh

drumlin preserve that narrow but consequential fact: before renewed ice sealed the ground, cold-country life persisted in a wet hollow of prehistoric Ireland.

Chapter 018 of 100

31183 BCE

Derryvree's Open Fen^[18]



“31,183 BCE” is a modern filing date, not a year that can be recovered from Ireland’s prehistoric record. There were no written calendars, named rulers or dated events on the island, and neither archaeology nor environmental science can identify what happened in a particular twelve-month interval so deep in time. In calendar arithmetic, the label falls about 33,100 years before the conventional radiocarbon baseline of AD 1950. The responsible history is therefore one of calibrated ranges, deposits and probabilities rather than a dated episode.

This point belongs to the Late Pleistocene, within Marine Isotope Stage 3, a climatically unstable stretch of the last Ice Age. Ireland was not the wooded, settled island of later prehistory. Its environments changed markedly across regions and centuries as cold phases, relatively milder intervals, shifting ice margins and lower sea levels altered habitats. The closest securely relevant Irish evidence is environmental rather than political or archaeological: a buried freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh.

Dating an Undated Year

The distinction between a radiocarbon result and a calendar date is essential. Radiocarbon laboratories measure the residual carbon-14 in once-living material and report an age in radiocarbon years before present. Atmospheric carbon-14 has varied over time, so such results must be calibrated against internationally maintained curves. For ages beyond the reach of securely continuous tree rings, calibration combines evidence from floating tree-ring sequences, lake sediments, corals and cave deposits; uncertainty consequently remains substantial. “Before present” also means before AD 1950, not before today.

At Derryvree, organic-rich silts and fine sands lay between two tills: deposits left by separate episodes of glacier ice. The organic horizon produced a conventional radiocarbon age of $30,500 \pm 1,200$ years BP. Published calibration has placed it broadly at about 36,900–31,700 calibrated years BP. That wide interval includes the modern label 31,183 BCE, but cannot pin the wetland, its plants or any animal visit to that exact year. It does, however, show that north-central Ireland was locally ice-free during part of this Middle Midlandian interval, before the last Irish Ice Sheet grew to its later maximum.

Nearby sites reinforce the point while also demonstrating the limits of precision. Organic deposits at Greenagho near Belcoo and at Hollymount near Maguiresbridge preserve other episodes of cold, non-glacial conditions. Their dates and environmental records do not form a neat annual sequence. They are fragments, separated by erosion, later ice action and the immense spans of time represented by glacial sediments. Together they rule out a simple picture in which all Ireland remained continuously buried beneath ice throughout the whole last cold stage.

A Cold Freshwater Landscape

The Derryvree deposit is especially valuable because it records a living environment, not merely the movement of ice. Its plant remains, pollen and insect evidence indicate open, cold country with freshwater pools or sluggish channels, wet ground, mosses, sedges and herbs. The vegetation was tundra-like and periglacial rather than forested. Periglacial does not necessarily mean ice covered the site: it means that severe freezing and thawing shaped soils, watercourses and plant communities in ground lying beyond or between major glaciers.

Such a setting would have been seasonally demanding. Long, cold winters, short growing seasons and frozen or waterlogged ground restricted trees and favoured hardy plants. Yet it was not lifeless. Freshwater plants and mosses imply shallow water and wet margins; insects provide evidence for the local climate and microhabitats; sediments register shifting water energy. A fen is not a grand monument, but its organic matter preserves the minute traces through which an otherwise vanished Irish landscape can be reconstructed.

It would be misleading, however, to turn this into a complete national scene. Derryvree was one locality in what is now County Fermanagh. Its wetland cannot establish identical conditions on Atlantic coasts, limestone uplands or the southern lowlands. The prudent interpretation is a mosaic: open habitats and freshwater refuges in at least some ice-free areas, set within a wider North Atlantic world becoming colder and increasingly dominated by expanding ice.

Before the Great Expansion

At this horizon the Last Glacial Maximum still lay ahead. Later in the last glaciation, ice covered most of Ireland and reshaped the island profoundly, eroding earlier surfaces and depositing the tills, drumlins and other landforms familiar today. Research on the chronology of the Irish Ice Sheet places major expansion after the Derryvree interval, with southern Ireland crossed by inland-sourced ice after about 24,000 calibrated years BP. This later advance both transformed habitats and destroyed or buried much evidence of the landscapes that preceded it.

This is why the archaeological record is so sparse. Absence of a camp, hearth or burial from 31,183 BCE does not prove that no person ever reached Ireland. Ice erosion, acidic soils, rising seas after the Ice Age and the limited investigation of deeply buried deposits have all reduced the chance of survival and

discovery. But preservation problems cannot be used to invent a population either. The surviving record permits a history of landscape and fauna; it does not permit a confident narrative of communities.

Castlepook's Animal World

County Cork provides the principal complementary evidence. Castlepook Cave, also called Mammoth Cave, near Doneraile, produced one of Ireland's most important collections of Late Pleistocene animal remains. Its historic excavations recovered bones attributed to spotted hyaena, reindeer, woolly mammoth, giant deer, brown bear, foxes, hares and smaller animals. The National Museum of Ireland describes Castlepook as the country's most important site for mammal remains of the last cold stage and notes that hyaenas and other mammals reached Ireland from Britain during a broad interval of roughly 45,000 to 30,000 years ago.

The fauna shows that Ireland could, at various times, support or be reached by sizeable grazing animals and their predators or scavengers. Reindeer were adapted to open, sparsely vegetated country. Mammoths and giant deer indicate substantial grazing landscapes during the periods represented by their bones. Spotted hyaenas point to a more complex food web than the modern island possesses. Animal movement also implies changing accessibility between Ireland and neighbouring landmasses as sea level, coastlines, ice and possible crossing routes changed.

But Castlepook is not a census taken in one season. Cave bone collections can be accumulated by carnivores, natural deaths, water movement and repeated use over thousands of years. Much of Castlepook was excavated between 1904 and 1908, before modern expectations for stratigraphic recording and microscopic taphonomic analysis. Later re-dating has shown that some old Irish cave dates were substantially too young, a warning against treating every specimen in a collection as contemporaneous.

The Human Question

A reindeer femur from Castlepook has been publicised as bearing a mark consistent with cutting or chopping fresh bone using a stone tool, while County Cork heritage material places the animal's death broadly around 30,000 BCE. If confirmed, that interpretation would be momentous: it could indicate that a person handled a reindeer in Ireland in the Upper Palaeolithic, far earlier than the formerly accepted evidence for human activity. Yet the distinction between possibility and proof must be retained. The bone's date, the interpretation of its surface mark and the date of any human action are separate questions.

There is no securely excavated settlement, hearth, stone-tool scatter, burial, dwelling floor, cemetery or artistic assemblage in Ireland that can be assigned to this date. Nor does one potentially worked bone establish a permanent population, repeated hunting territory, descent into later Irish communities or a route by which visitors arrived. The first published evidence generally treated as secure for Palaeolithic human activity in Ireland is much later: a cut-marked brown-bear patella from Alice and Gwendoline Cave in County Clare, dating to the terminal Pleistocene.

No Kingdoms, No Trade Network

Accordingly, there is no evidence for political affairs in Ireland in 31,183 BCE: no kingship, chiefdom, diplomacy, warfare, law or named people. "Irish" is a geographic description here, not an ethnic or linguistic identity. There is likewise no Irish evidence from this date for religion, formal

learning, monuments, grave rites, cultivated crops, livestock or trade networks. Upper Palaeolithic societies elsewhere in Europe made sophisticated tools, images and ornaments, but those continental achievements are context, not proof that equivalent practices occurred in Ireland.

If people did briefly visit, they may have been mobile hunter-gatherers capable of exploiting animal resources in a severe seasonal environment. That remains an inference from broader European prehistory and the possible Castlepook evidence, not a demonstrated Irish social system. Nothing allows us responsibly to reconstruct their language, kinship, clothing, rituals or beliefs. The most important story is instead ecological: an open, cold island landscape with wetlands, large mammals and fluctuating opportunities for movement, on the threshold of much more extensive glaciation.

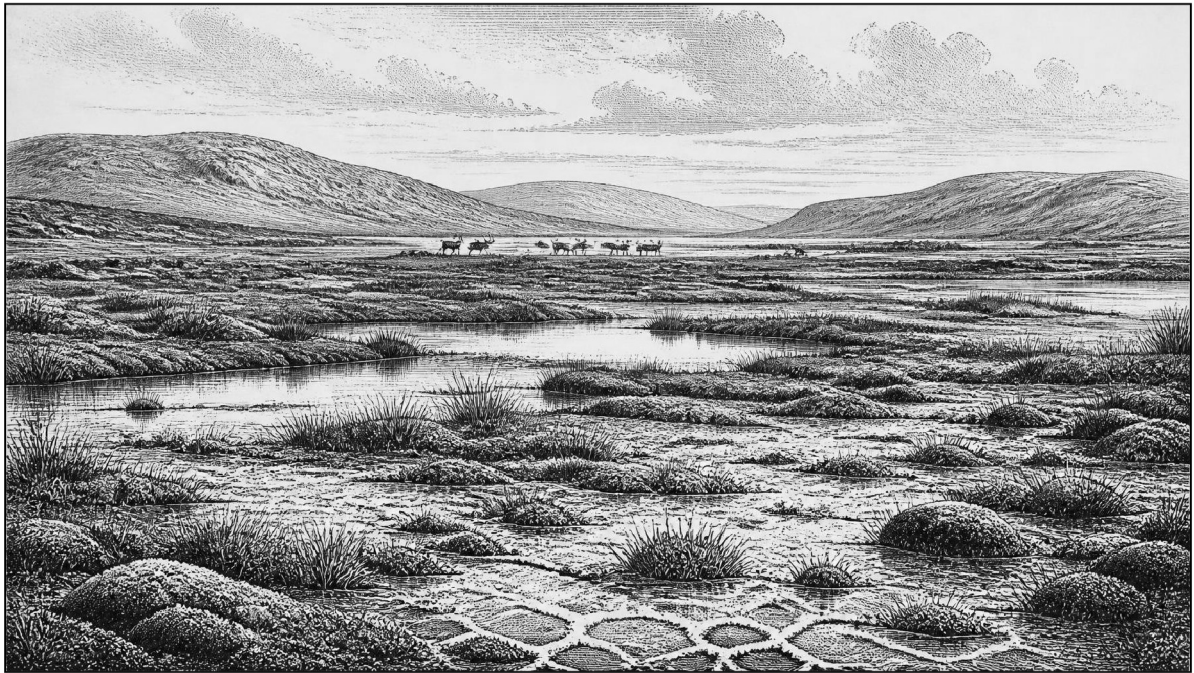
What the Fen Preserves

Derryvree's importance lies precisely in its modest scale. A buried fen, sealed between glacier deposits, preserves proof that life persisted in an ice-age landscape that later ice almost erased. Its mosses, sedges, aquatic plants and insects offer stronger evidence for Ireland around this broad horizon than any invented tale of a ruler, battle or settlement could. Around 31,183 BCE, the island's history is not yet a sequence of human events. It is the deep environmental precondition from which the much later histories of settlement, society and culture would eventually emerge.

Chapter 019 of 100

31182 BCE

Aghnadarragh's Mammoth Gravel^[19]



31,182 BCE is not a year that can be recovered from Ireland's prehistoric record in the way that a later annalistic date can. No calendar was in use here, no written testimony survives, and no excavation can date an action to a single modern year so far back. The label is best understood as a modern point within a much broader interval: roughly 33,131 years before AD 1950, during the Late Pleistocene and Marine Isotope Stage 3. The appropriate evidence is therefore archaeological and environmental, and its dates are ranges rather than anniversaries.

The closest securely relevant Irish sequence is the organic deposit discovered beneath a drumlin at Derryvree, near Maguiresbridge in County Fermanagh. Its conventional radiocarbon determination, Birm-166, was 30,500 radiocarbon years before present, with a substantial uncertainty. When considered through later calibration and modelling, the deposit belongs broadly within about 31,700–36,900 calibrated years before present. That range encompasses the modern calendar label 31,182 BCE. It does not prove what occurred in that particular notional year, but it gives unusually direct evidence for an Irish landscape of approximately this age.

A Landscape Between Ice Advances

Derryvree was exposed in a road cutting in 1969. The section revealed freshwater silts and fine sands, including organic-rich layers, sealed between two thick sheets of glacial till. This stratigraphy matters. The lower till records an earlier episode when ice had overridden the locality; the organic sediments indicate that the ground was later free of glacier ice long enough for water, plants, insects and sediment to accumulate; and the upper till shows that ice subsequently returned. The site is not a snapshot of all Ireland. It is, however, compelling local evidence that part of Fermanagh could be ice-free during a cold phase before the greatest expansion of the last British–Irish Ice Sheet.

At this time Ireland was not the familiar green island of woods, fields and enclosed farms. The fossil evidence from Derryvree points to a treeless, open and periglacial setting. Grasses, sedges, herbs, mosses and low-growing cold-tolerant plants occupied wet ground around shallow pools. Insects and plant remains indicate a marshy or muskeg-like mosaic rather than a uniform frozen desert. Summer thaw could sustain standing water and a short growing season; winter conditions were severe enough for frost processes to shape the ground. The alternation of wet hollows, exposed mineral soil and sparse vegetation would have made the landscape highly seasonal.

That reconstruction must remain local. A road-cut sediment bed cannot map every valley, coast or upland across the island. Nor does an ice-free Fermanagh basin demonstrate that every part of Ireland was open country at the same moment. Yet Derryvree is especially valuable precisely because it is material evidence of land, freshwater and vegetation between glacial episodes. It cautions against imagining either an Ireland permanently entombed beneath ice or an island comfortably habitable throughout the whole Ice Age.

Cold-Stage Ireland in a Changing North Atlantic

The broader climate was unstable. Marine Isotope Stage 3, the interval before about 29,000 years ago, contained abrupt shifts recorded particularly clearly in Greenland ice cores. Irish cave deposits offer a regional counterpart. At Crag Cave in County Kerry, uranium-thorium dating shows that speleothems grew episodically during warmer intervals when liquid water could percolate through the shallow cave system. Their growth and interruption demonstrate that Ireland's climate was sensitive to millennial-scale changes in the North Atlantic world. Such evidence does not translate directly into an annual Irish weather report, but it supports an image of repeated environmental reorganisation rather than one unchanging cold.

The date in question also falls before the fullest development of the Last Glacial Maximum, when the British-Irish Ice Sheet covered most of Ireland and adjacent shelves. Modern reconstructions show that the growth, maximum extent and retreat of that ice sheet varied sharply by sector; its maximum did not occur everywhere at precisely the same time. It would therefore be misleading to claim that a single ice margin stood at a particular Irish location in 31,182 BCE. What can be said is that Ireland was entering a climatically harsher part of the last glacial cycle, and that later ice advances would bury, rework and destroy much of the evidence from earlier open-ground intervals.

Other northern sites help establish this long perspective. Aghnadarragh, near Lough Neagh in County Antrim, preserves a layered Midlandian sequence of till, freshwater deposits and stratified sediments. Its deposits include material associated with woolly mammoth and record alternation between glacial occupation and non-glacial environments. Greenagho in Fermanagh and other inter-till localities add further, though often poorly dated, signs of cold and open conditions. Together, these sites show why Ireland's Ice Age history cannot be reduced to a simple advance followed by retreat. Ice, water, sediment, vegetation and animal communities changed repeatedly.

Animals on the Open Ground

The animal record is fragmentary, but it makes the cold-stage setting more tangible. Cave collections and fossil finds from Ireland include remains attributed to reindeer, woolly mammoth, spotted hyaena, wolf, fox, hare and lemming, alongside other large herbivores and carnivores. Not every species occurred at every site or at the same date, and old collections often lack the secure stratigraphic information

expected today. Nonetheless, the assemblages demonstrate that Ireland was connected to wider north-west European ecological networks during parts of the Late Pleistocene. Animals capable of living in open, cold environments could reach and use parts of the island.

Castlepook Cave near Doneraile in north Cork is particularly important. Excavations undertaken between 1904 and 1912 recovered a remarkable collection of Ice Age animal bones, including mammoth and reindeer. Some material has yielded pre-Last Glacial Maximum ages broadly in the 34,000–35,000 radiocarbon-year range, while later re-dating programmes have shown that cave assemblages may also contain much younger Late Glacial remains. A cave collection is therefore an archive accumulated across long spans, not proof of a single faunal community gathered in one season.

For everyday ecology, reindeer are suggestive. Their presence would fit open vegetation and the possibility of seasonal movement through a terrain where forage quality changed rapidly. Mammoth remains evoke the wider mammoth-steppe world familiar from continental Europe, but a bone in an Irish cave does not establish large resident herds or an uninterrupted population. Carnivores further complicate the picture: hyaenas and other scavengers could transport, break and modify bones. The evidence confirms that Ice Age animals entered Ireland; it cannot reconstruct their exact routes, numbers or migration calendars.

The Human Question at Castlepook

The most arresting possible human evidence is a reindeer femur from Castlepook. It has been publicly reported as roughly 33,000 years old and as carrying a deep mark interpreted by zooarchaeologist Ruth Carden as an incision or chop made with a sharp stone implement during carcass processing. If that interpretation is confirmed by further analysis and securely dated context, it would indicate that people handled a reindeer in Ireland during the Upper Palaeolithic, many millennia before the well-established post-glacial settlement record.

That conditional is essential. The specimen derives from an early twentieth-century cave collection rather than a modern excavation of an intact occupation surface. There is no securely associated hearth, stone-tool assemblage, dwelling, burial, human bone or repeated butchered deposit of the same age. A date on the bone establishes when the animal lived, not automatically the moment when a surface mark was made. Cave deposits may be disturbed by water, frost, collapse, burrowing and carnivore activity. The femur is consequently significant evidence under investigation, not a licence to describe a named hunting party, a camp or a permanent population in Ireland in 31,182 BCE.

No Politics, No Proven Settlements

There is no responsible basis for political history at this date. No rulers, territories, diplomatic relations, war bands or treaties can be identified. Nor is there evidence for farming, animal husbandry, houses, villages, exchange systems, seafaring networks, formal religion, monuments, art or writing in Ireland around this horizon. A marked animal bone, even if humanly modified, would speak only of a brief act of carcass processing. It would not demonstrate ownership of land, trade in meat or hides, organised conflict, or cultural continuity with later inhabitants.

The same restraint applies to society and learning. Any people who reached Ireland during a temporarily favourable phase would probably have been highly mobile hunter-gatherers, using knowledge and technologies comparable to Upper Palaeolithic groups elsewhere in north-west Europe. That is a contextual inference, not direct Irish proof. No excavated Irish assemblage of this age presently reveals

the size of a group, its language, kinship, beliefs, food-sharing customs or seasonal round. Ireland's securely evidenced, sustained human settlement belongs much later, after the final withdrawal of the great ice sheets.

The historical importance of 31,182 BCE therefore lies not in an invented event but in a demanding landscape and the survival of slender evidence. The freshwater silts at Derryvree preserve plants and insects from a cold wetland between glaciers. Aghnadarragh records the deeper rhythm of ice, sediments and large animals. Castlepook raises, but does not settle, the question of a very early human visit. Read together, they show an Ireland intermittently available to life, environmentally connected to Ice Age Europe, and still far beyond the reach of calendar-year history.

Chapter 020 of 100

31181 BCE

Maguirebridge's Freshwater Interlude^[20]



31,181 BCE is a modern chronological label, not a year that anyone in Ice Age Ireland could have recognised or recorded. It corresponds roughly to 33,130 years before AD 1950 in calibrated calendar terms, but that apparent precision is misleading. For this depth of time, radiocarbon results have substantial uncertainty, calibration curves are themselves refined as evidence improves, and Irish deposits rarely preserve a continuous sequence that can be resolved to a single year. The responsible subject is therefore Ireland during a broad interval around this date: the later Pleistocene, within Marine Isotope Stage 3 (MIS 3), a climatically unstable part of the last Ice Age.

Reading a Date Through Ranges

The most valuable Irish environmental evidence close to this notional year comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin, a hill formed and streamlined by glacier ice. Between two thick layers of till—stony sediment deposited by ice—investigators found fine sands and silts laid down in freshwater conditions. Organic remains within this buried deposit returned a conventional radiocarbon determination of 30,500 years BP, with a large laboratory uncertainty of +1,170 and −1,030 years.

Radiocarbon years are not calendar years. Using modern calibration, the Derryvree deposit has been placed broadly within about 36,900–31,700 calibrated years BP, approximately 34,950–29,750 BCE. The conventional label 31,181 BCE falls within that broad span, but no individual plant, insect, animal or episode can be assigned to it. Derryvree is not a diary. It is an accumulation of sediment that represents an interval, later sealed beneath renewed glacial deposits.

Even so, its sequence establishes something important. At this northern locality, an earlier phase of glaciation had been followed by a period when open water, wet ground and vegetation could exist; later, ice again affected the landscape. It is unusually direct evidence that Ireland's last cold stage was not a simple story of permanent island-wide ice. Conditions changed sharply over thousands of years, and their timing and geographical reach remain matters of active research.

A Tundra Wetland, Not a Familiar Ireland

The Derryvree flora and small-animal remains point to open tundra vegetation and a periglacial climate: ground affected by severe cold, freezing and thawing, rather than a wooded countryside. A fossil seed of bogbean, a plant associated with wet places, is one memorable trace from the deposit. Mosses, sedges and other cold-tolerant plants, together with aquatic and wetland conditions, indicate that water persisted locally despite a generally harsh climate. The scene was not an Irish bog in the modern sense, nor evidence for a mild, settled landscape. It was a cold freshwater hollow within a sparsely vegetated environment.

That distinction matters. The record supports a local reconstruction of a wetland edge: shallow water or saturated sediment, low vegetation and short productive seasons. It does not permit an exact temperature for 31,181 BCE, a map of every habitat in Ireland, or a claim that all regions looked alike. Ireland's varied relief, Atlantic position and shifting ice margins would have produced regional differences. What Derryvree securely shows is that plants and small animals were able to occupy at least one ice-free or ice-free-adjacent landscape during a cold interval.

Evidence from Crag Cave in County Kerry complements this northern archive without turning it into an annual weather report. Uranium-thorium dates show that calcite formations in the cave grew episodically through much of MIS 3. Since stalagmite growth requires moving liquid water, these deposits indicate recurrent ameliorations in south-west Ireland, probably when average annual temperatures rose above freezing. The cave record also shows abruptness: favourable growth ceased in colder stadial phases. Around the date represented here, Ireland belonged to a North Atlantic world of pronounced climatic oscillation, not a uniformly descending march towards the glacial maximum.

Animals in a Fragmentary Archive

Irish cave deposits provide the chief evidence for larger animals during this part of the Pleistocene. Castlepook Cave near Doneraile, County Cork, is especially important. Its collections include remains attributed to reindeer, brown bear, wolf, Arctic fox, hare, lemmings, spotted hyaena, giant deer and woolly mammoth. These animals make ecological sense in a largely open, cold landscape, but the cave assemblage must not be treated as a single living community photographed at one moment. Bones entered caves through carnivore activity, natural death, water movement and excavation disturbance, and direct re-dating has shown that some earlier determinations were seriously too young.

The safest conclusion is that a varied, cold-adapted fauna reached Ireland during MIS 3, and that the island was intermittently habitable for animals capable of moving through changing north-west European landscapes. Reindeer are particularly relevant to the open habitats suggested by Derryvree. They could exploit seasonal vegetation and travel widely. Yet fossils alone cannot tell us how numerous their herds were, whether they returned every year, or whether they crossed by a single route. Nor do they demonstrate that mammoths, hyaenas, bears and reindeer all met in one Cork valley at 31,181 BCE.

The landscape was also approaching a more severe phase. The maximum extent of the last British-Irish Ice Sheet lay later, principally around 26,000–20,000 years BP, although the growth, extent and behaviour of ice before and around 31,000 years ago are still debated. It would be wrong to picture the whole island already smothered beneath the later ice sheet; equally, it would be wrong to imagine an unbroken refuge. Ice advances, permafrost, erosion and subsequent sea-level change removed or disturbed much of the evidence that might otherwise settle the question.

The Human Question at Castlepook

The possibility of people in Ireland around this broad period rests on exceptionally slight evidence. A reindeer bone from Castlepook Cave has been reported as bearing a deep mark interpreted as fresh-bone modification by a sharp stone implement, and it has been associated in public discussion with an age of about 33,000 years ago. If that interpretation is sustained, it may indicate the butchery of a carcass by people during MIS 3 and would push evidence for human activity in Ireland far earlier than the post-glacial Mesolithic settlements.

But this is not proof of a village, a permanent population or a named Palaeolithic community. The bone is not a house floor, hearth, campsite or tool assemblage. Its date concerns the animal bone, while identifying the mark as human work requires separate taphonomic judgement. Castlepook's deposits were also excavated long ago and have complicated histories. The interpretation is important precisely because it is testable: new excavation, microscopic study, secure stratigraphy and further direct dating may confirm, qualify or overturn it.

If people did reach Ireland in this interval, the most cautious model is of small, highly mobile hunter-gatherer parties making brief use of a changing landscape, perhaps following or encountering animal resources. Carcass processing would have provided meat, fat, hide, sinew and bone, but this remains an inference from a possible modified bone, not a documented subsistence system. There is no secure evidence here for dwellings, boats, clothing styles, family groups, food stores or a regular crossing route between Ireland and Britain.

No Politics, No Recorded Beliefs

Political affairs, diplomacy and warfare cannot responsibly be reconstructed for Ireland at this date. There are no names, languages, territories, leaders, graves or monuments, and no written source by many tens of millennia. Nor is there direct Irish evidence for ritual, art, formal burial practice or religious belief around 31,181 BCE. The absence of evidence should not be turned into a claim that people lacked culture; it means only that the surviving Irish record cannot reveal it.

The same caution applies to economy and trade. A possible episode of reindeer butchery would imply skilled knowledge of animal bodies and cutting tools, but not markets, exchange networks or established seasonal camps. The sea and adjoining lands were shaped by much lower global sea levels and by shifting ice, yet no securely dated evidence identifies the route by which animals—or people, if present—entered Ireland. Mobility is plausible; a mapped transport corridor is not.

What This Interval Leaves Behind

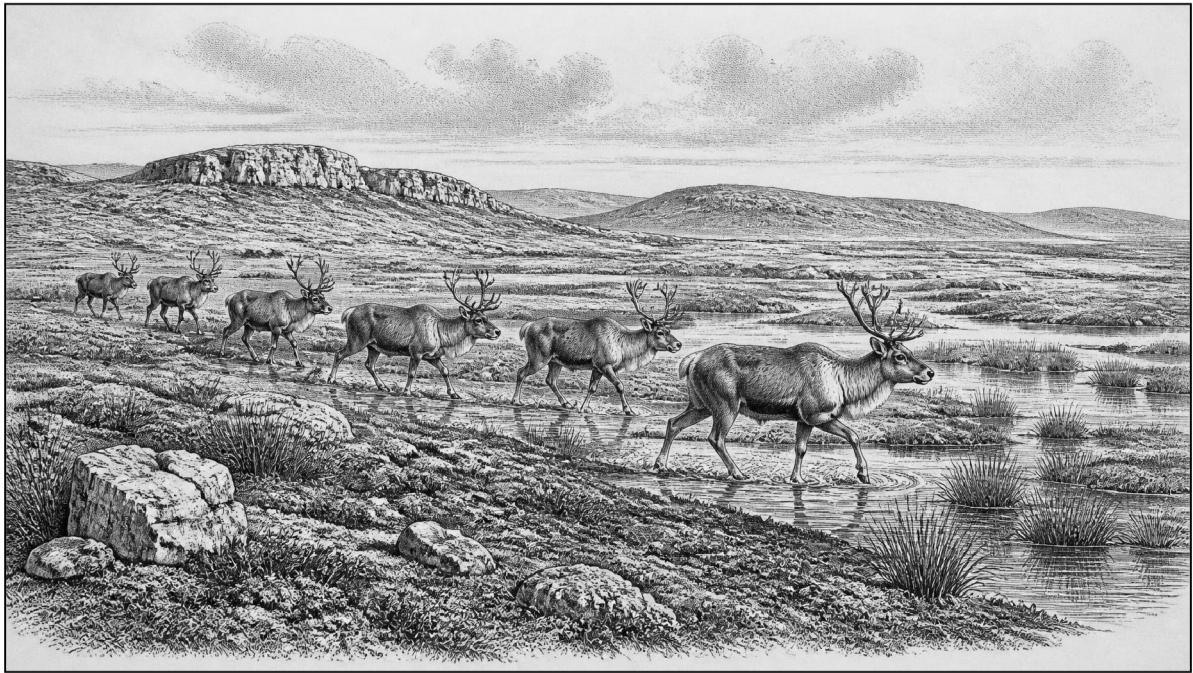
The significance of Ireland around 31,181 BCE lies less in a single event than in the survival of a few difficult archives. Derrynvree preserves a freshwater interlude between glacial deposits, with tundra plants and wetland life. Crag Cave records episodes when liquid water again circulated beneath south-west Ireland. Castlepook preserves a time-averaged animal record and a provocative, but still limited, clue to human action. Together they replace the old image of an unchanging frozen blank with one of fluctuating cold landscapes, ecological opportunities and repeated loss of evidence.

That is the proper scale for this year-by-year entry. Modern calendar-year precision is unavailable. What can be said is that, within calibrated ranges embracing this notional date, parts of Ireland supported open, cold-climate ecosystems; freshwater habitats existed at Derrynvree; large mammals moved through the island at different times in MIS 3; and a possible humanly modified reindeer bone keeps open the question of very early visits. The strongest history of 31,181 BCE is therefore a history of sediments, bones, water and uncertainty.

Chapter 021 of 100

31180 BCE

Cork's Pleistocene Reindeer^[21]



The label 31,180 BCE is useful only as a modern point on a very long timescale. It does not mark an Irish event that can be recovered to a particular year, season or generation. Ireland had no written records, named rulers, settlements or political boundaries that archaeology can place at this date. In calendar terms it is roughly 33,130 years before AD 1950, the conventional 'present' used in radiocarbon reporting. The responsible frame is therefore a broad one: later Marine Isotope Stage 3, during the Midlandian cold stage, before the Last Glacial Maximum reached its greatest extent over Ireland.

A Date Within Ranges

Radiocarbon measurements do not translate directly into modern calendar years. They give ages in radiocarbon years before present, with statistical uncertainty, and must then be calibrated against records of past atmospheric carbon. At more than 30,000 years ago, those calibrated ranges can be wide. IntCal20, the principal Northern Hemisphere calibration curve, extends to 55,000 calendar years before present, but it cannot turn a deep-prehistoric label such as 31,180 BCE into a securely dated Irish episode.

The closest local chronological guide is the freshwater deposit found beneath a drumlin at Derryvree, near Maguiresbridge in County Fermanagh. Organic-rich silts and sands lay between two tills: deposits left by separate glacial advances. Material from the freshwater sequence produced a conventional radiocarbon determination of 30,500 +1,170/-1,030 BP. Published calibrations have placed the episode broadly in the range of about 36,900–31,700 cal BP. The modern year-label in question falls within that extensive interval, but it cannot be assigned to one stratum, one plant, or one moment in the life of the wetland.

This distinction is essential. Derryvree is evidence for conditions in one Fermanagh basin during a broad climatic phase; it is not a diary of all Ireland. Castlepook Cave in north County Cork preserves animal remains of broadly comparable pre-Last Glacial Maximum age, but the cave deposits were excavated long before modern recovery and recording methods. Their contents represent a complicated accumulation rather than a single, sealed occupation layer. The evidence is powerful, but its limits are as important as its promise.

Treeless Ground and Moving Water

At Derryvree, pollen, plant macrofossils, mosses and insects indicate a cold, open, periglacial setting. Sedges, grasses and hardy herbs belonged to a landscape without forest cover, while the freshwater deposit itself points to pools, wet ground and slow-moving water. Moss-rich vegetation and aquatic plants could flourish locally during the short growing season, even though winters were severe. The best reconstruction is not an unbroken white wilderness but a tundra-muskeg mosaic: damp hollows and shallow water set amid sparsely vegetated ground affected by frost.

That local picture should not be mistaken for uniform Irish weather. Altitude, exposure, drainage and proximity to the Atlantic mattered. Yet the overall evidence supports a markedly colder and more seasonal Ireland than today. Repeated glacial expansion had already shaped the terrain, while later ice would override and rearrange large areas. Soils were thin or unstable in many places; freeze-thaw processes disturbed ground; and plant communities could move quickly as climate altered. The island's familiar wooded appearance belonged to a much later age.

Sea level was lower globally because much water was locked in northern ice sheets, but it does not follow that a simple land bridge joined Ireland to Britain or continental Europe at this precise time. The Irish Sea basin has complex depths, changing coastlines and local crustal movements caused by ice loading. There may have been broader coastal plains and altered routes in parts of the Irish Sea world, but the geography of crossings remains uncertain. Any people or animals reaching Ireland did so within an unstable north-west European landscape, not across a confidently mapped modern-style road.

The Castlepook Fauna

Castlepook Cave, near Doneraile in County Cork, is central to understanding Ireland's deep Ice Age past. Its bone assemblage includes animals associated with cold, open country: reindeer, woolly mammoth, spotted hyaena, wolf, Arctic fox, lemmings, hare, bear and giant deer. Not every species need have lived beside the cave at precisely the same time, and cave bone collections can combine deaths, carnivore activity and later disturbance. Nevertheless, the assemblage establishes that Ireland was accessible enough, at least intermittently, for a diverse Pleistocene fauna.

Reindeer are particularly evocative because they suggest herds adapted to exposed, low-vegetation terrain. Mammoths and giant deer point to productive patches within a wider cold-steppe or tundra environment; hyaenas and wolves demonstrate that large carcasses could be scavenged, transported and consumed by predators. A cave is not necessarily where an animal died. Carnivores can drag bones into dens, water can move material, and nineteenth- and early twentieth-century excavations did not record every association now expected by archaeologists. The cave therefore reveals an ecological community more securely than it reveals a single scene.

The fauna also corrects a simplistic idea that Ireland was continuously sealed beneath ice throughout the whole cold stage. Around this broad interval, at least some areas supported animals, water and vegetation. But the word ‘supported’ must not be exaggerated into a claim of environmental comfort. This was a demanding habitat of cold winters, short summers, shifting resources and substantial predation risk. Its capacity to sustain large mammals may have varied sharply through time and from region to region.

A Marked Bone, Not a Settlement

A reindeer femur from Castlepook has given this period exceptional archaeological importance. Zooarchaeological study identified a deep incision interpreted as a possible cut mark made by a stone tool during carcass processing. The bone has been dated to around 33,000 years ago, and County Cork’s heritage record presents it as possible evidence that Palaeolithic hunters butchered reindeer in Ireland. If that interpretation is confirmed, it would be Ireland’s earliest known indication of human activity by many millennia.

Yet the conclusion must remain carefully qualified. The radiocarbon determination dates the death of the reindeer, not necessarily the making of the mark. No stone tools, hearth, dwelling floor, human bone or securely associated group of butchered remains has been recovered from the cave to demonstrate an occupation. Nor can the incision identify the species, language, ancestry or cultural tradition of its maker. The safest interpretation is that the femur preserves a serious and important possibility of a brief human encounter with a reindeer carcass, rather than proof of permanent settlement.

Such an encounter could have involved a very small, mobile party exploiting a carcass or hunting an animal during a favourable interval. It is equally possible that the kill occurred outside the cave, with a bone later moved by scavengers. The distinction matters: a butchery trace is evidence for an action, not for a village. Ireland’s later Mesolithic settlement record cannot be projected backwards onto this much earlier, harsher world.

Society Beyond the Evidence

There is no basis for describing political affairs, warfare, diplomacy, trade networks, farming communities or formal religious institutions in Ireland at this date. No chief, tribe, territory or monument can responsibly be named. There is likewise no evidence for cultivation, livestock, pottery, metalworking, writing, schools or a settled economy. The absence of evidence does not prove that no person ever crossed this landscape; it does mean that archaeology cannot reconstruct a resident society.

If people were present, their everyday life would have been governed above all by movement, weather and food. Reindeer meat, marrow, hide, sinew and bone would have been valuable resources, but even this is an inference from the marked femur and from broader Upper Palaeolithic practice elsewhere in Europe, not a documented Irish subsistence system. Stone tools, if used, may have been carried away, lost beyond later ice erosion, or remain undiscovered in caves, river deposits or submerged landscapes. The most honest cultural history is consequently a history of potential, not of established institutions.

Religion and learning are similarly beyond direct recovery. A group capable of navigating seasonal landscapes would have possessed detailed practical knowledge: animal behaviour, safe routes, weather signs, raw materials and the risks of cold exposure. But no Irish object or site of this age allows archaeologists to identify ritual, art, language, myth or teaching practices. To supply them would be imaginative reconstruction, not history.

Before the Maximum Ice

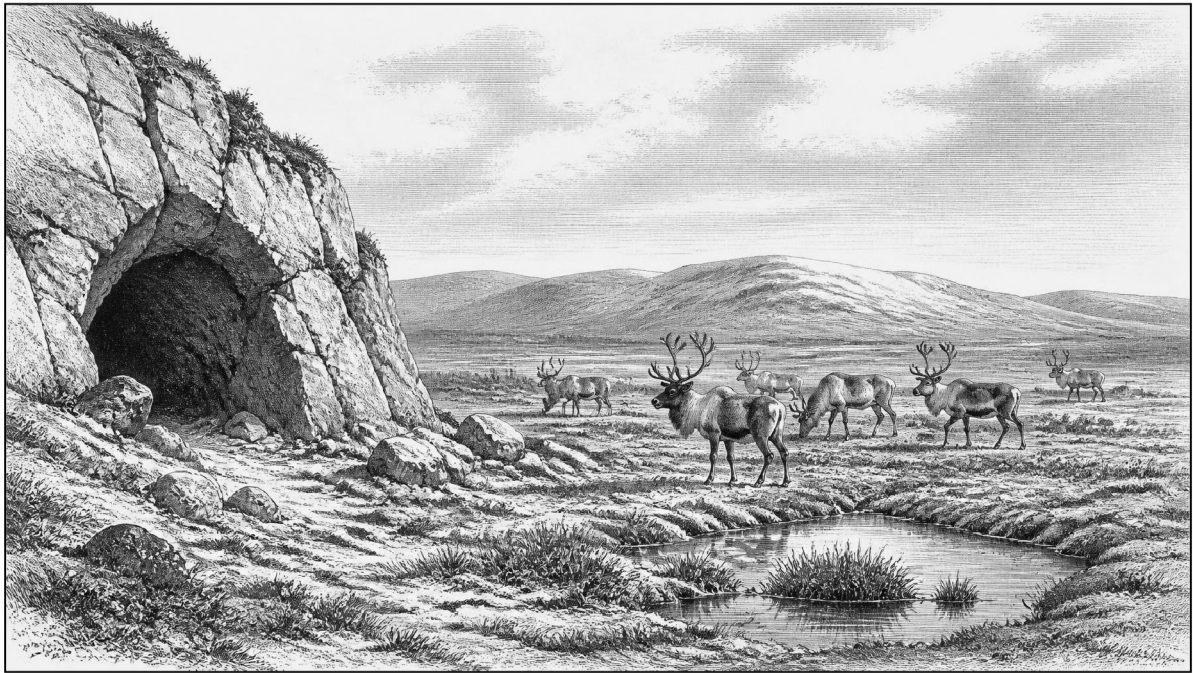
The broader trajectory is clearer than the individual year. Ireland was moving towards the Last Glacial Maximum, when the British-Irish Ice Sheet expanded across most of the island and continental shelf, reaching maximum extent broadly between about 27,000 and 23,000 cal BP. That later advance removed, buried or disturbed many earlier land surfaces. It helps explain why the record for 31,180 BCE is so slight and why cave bones, inter-till sediments and scattered geological exposures carry such disproportionate importance.

For Ireland around this date, then, the principal story is neither kingdom nor conquest. It is an island of cold open ground, freshwater hollows and large mammals, poised within a changing glacial world. Derryvree offers the clearest environmental evidence; Castlepook offers the clearest faunal evidence and a tantalising human question. Together they show that Ireland's history at this depth is real, recoverable and fascinating—but resolutely measured in ranges, landscapes and probabilities rather than in calendar-year events.

Chapter 022 of 100

31179 BCE

Derryvree's Intertill Ecosystem^[22]



31,179 BCE is not a date at which Ireland can be described through an event, a ruler or an episode of settlement. It is a modern calendar label imposed upon a much deeper past. In radiocarbon convention it falls roughly 33,130 calendar years before AD 1950, during the Late Pleistocene and broadly within Marine Isotope Stage 3 (MIS 3), a long, unstable phase of the last Ice Age. Modern calendar-year precision is unavailable at this depth of time. The responsible subject is therefore an environmental and archaeological horizon extending across centuries and millennia, not a single year in an Irish chronicle.

A Date Within Broad Ranges

Radiocarbon dates are not calendar dates read directly from an object. They measure residual carbon-14 and must be calibrated because atmospheric carbon-14 has varied over time. At around 33,000 calendar years ago, calibration produces ranges that can be wide and sometimes irregular. Stratigraphy, the order of deposits in the ground, adds relative sequence but rarely a precise annual timestamp. Consequently, 31,179 BCE should be read as a point within the later Middle Midlandian, or MIS 3, rather than as the date on which a particular animal died, pool formed or person arrived.

The closest important Irish environmental record comes from Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and exposed freshwater silts, fine sands and organic muds sealed between two layers of glacial till. The basic sequence is secure: ice deposited the lower till; an ice-free interval then allowed standing or slowly moving freshwater, plants and small animals to leave a record; later glacier ice buried it beneath another till. Organic material from this middle

deposit returned a conventional radiocarbon age of 30,500 years BP, with substantial uncertainty. Later calibration places it broadly between about 36,900 and 31,700 calendar years BP, or approximately 34,950–29,750 BCE. The nominated year lies within that broad range, but cannot be isolated within it.

Fermanagh Between Ice Advances

Derryvree is unusually valuable because it preserves life in an interval otherwise obscured or destroyed by later glaciation. Its pollen, plant macrofossils and invertebrate remains indicate a cold, open and largely treeless landscape. Grasses, sedges, herbs, mosses and Arctic-alpine plants belonged to a tundra-like vegetation. Mountain-avens, dwarf willow, clubmoss and bogbean are among the kinds of plants associated with the deposit. Bogbean in particular points to shallow freshwater or marshy margins; mosses and sedges indicate wet ground. The landscape was not a forested Ireland of oak, hazel and pasture, but a periglacial mosaic of pools, saturated hollows, sparse vegetation and frost-affected ground.

“Periglacial” does not mean permanently covered by ice. It describes ground shaped by a cold climate close to glaciers or ice sheets: seasonal freezing and thawing, poor drainage, exposed soils and short growing seasons. Derryvree shows that part of northern Ireland supported freshwater ecosystems during a cold interval. It does not prove that the whole island was simultaneously ice-free, nor that its weather was uniform. Ireland’s topography, changing ice margins and maritime position would have created local differences. Still, the evidence decisively rules out a simple picture of an unbroken white ice sheet across every Irish landscape throughout the whole period.

Another Fermanagh site, Greenagho near Belcoo, preserves organic lacustrine deposits below later till and supports the wider conclusion that northern Ireland experienced significant non-glacial intervals during MIS 3. Such records matter because later ice advances rearranged sediments, scoured bedrock and erased older surfaces. What survives is therefore a fragmentary archive. It can establish broad environmental possibilities and sequences, but it cannot provide a complete map of Ireland in 31,179 BCE.

Reindeer, Mammoth and Predators

Southern Ireland supplies a different kind of evidence: cave faunas. Castlepook Cave near Doneraile in north County Cork, long known as Mammoth Cave, produced a remarkable collection of Ice Age bones during antiquarian excavations. Reindeer, woolly mammoth, brown bear, hare, fox and spotted hyaena form part of the wider assemblage studied from the cave system and related collections. The cave’s limestone passages did not represent an ordinary settlement surface. Bones could have accumulated through carnivore activity, animals dying in or near cavities, water movement, collapse, and early excavators’ imperfect recovery and recording.

Nevertheless, the fauna is powerful evidence that Ireland was reached by cold-stage mammals during parts of MIS 3. Reindeer are especially suited to open northern environments and their presence fits the treeless, grass-and-herb-rich country suggested by the Fermanagh deposits. Mammoths evoke an open, productive steppe-tundra rather than dense woodland, although no single cave collection should be treated as a neat photograph of one day’s living animal community. Different species, bones and deposits may belong to different centuries or millennia. Spotted hyaenas also complicate the story: caves could be dens and scavenging places, not merely refuges for people.

The Unsettled Human Question

Castlepook has renewed the question of whether people entered Ireland far earlier than the securely documented post-glacial settlement record. A reindeer femur from the cave collections has been reported as approximately 33,000 years old and as bearing a deep mark interpreted as possible fresh-bone butchery by a stone tool. If that interpretation is sustained by further microscopic and contextual work, it would indicate that one or more Upper Palaeolithic people handled a reindeer carcass in Ireland during MIS 3. This would be an important, early trace of human activity.

It must not, however, be inflated into evidence for a permanent Irish population in 31,179 BCE. The bone comes from an old collection rather than a recently excavated occupation floor with a securely recorded position. No associated hearth, built shelter, stone-tool assemblage, human burial, repeated butchery area or settlement has yet established a resident community of this age. A date on animal bone is not automatically the date of a mark upon it; identifying a cut mark requires separate taphonomic judgement. Re-dating of other Castlepook fauna has also shown how strongly improved laboratory methods can revise old chronologies. The most careful conclusion is that human presence is possible, perhaps increasingly plausible, but remains limited and contested.

If small hunting parties did cross into Ireland during this interval, their movements were probably episodic rather than politically organised colonisation. Lower global sea levels exposed substantial areas of the continental shelf, while ice, changing coastlines and sea channels made the geography unlike that of modern Ireland. Yet there is no responsible basis for assigning a named people, language, territory or route to such visitors. They would have depended on portable knowledge: reading animal tracks, finding shelter, maintaining fire, repairing stone tools and navigating a severe seasonal landscape.

No Politics, No Proven Trade

Political affairs, diplomacy and warfare leave no identifiable record for Ireland at this date. There were no known kingdoms, chiefs, monuments, boundaries or institutions. Nor is there evidence for trade in the later prehistoric sense: no exchange networks can be reconstructed from Irish objects, and no mines, farms, ports or workshops are known. If people were present, their economy would have been based on immediate procurement of food, hides, fuel and workable stone, with decisions shaped by weather and animal movement rather than agriculture or stored surplus.

Religion, culture and learning are equally beyond direct recovery. It would be wrong to project later Irish myth, Celtic practice or Christianity backwards into this landscape. People elsewhere in Upper Palaeolithic Europe demonstrably had sophisticated technologies and symbolic lives, but no comparable Irish art, ornament, burial or ritual place is securely attributable to this period. Absence of evidence is not proof of absence; it is, however, a reason to distinguish what Ireland's deposits demonstrate from what wider European comparison merely makes conceivable.

The Iceward Future

The world represented by Derryvree and Castlepook lay before the fullest expansion of the last British–Irish Ice Sheet. Later in the glacial cycle, particularly around 27,000–24,000 calendar years BP, ice advanced widely across the surrounding shelves and over much of Ireland. At its maximum stages, the

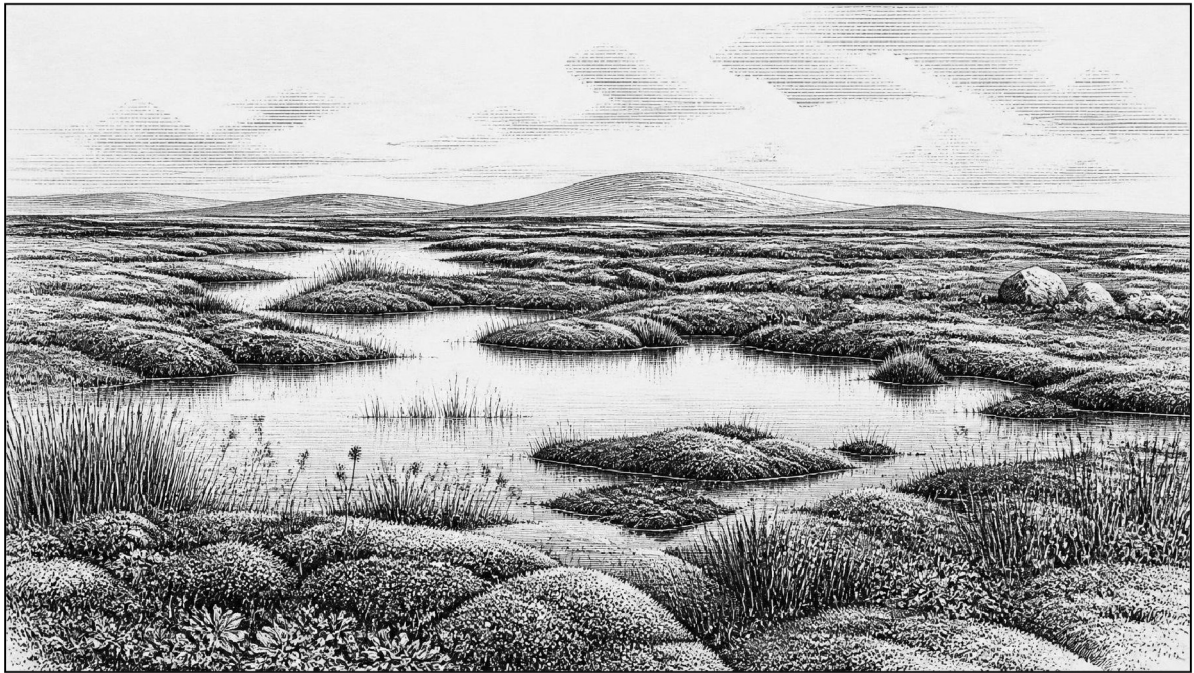
island's geography and habitable ground were profoundly reduced. The till overlying Derryvree's freshwater beds records that its wet tundra did not last indefinitely: renewed glaciation sealed its ecological archive beneath ice-borne debris.

This later destruction helps explain why the evidence for Ireland around 31,179 BCE is so thin. The country's oldest human history is not an empty page because nothing happened; it is a damaged manuscript. Drumlin sections, cave bones, pollen grains, moss fragments, insect remains and radiocarbon measurements preserve scattered sentences. Together they reveal a cold but locally living island: one of marshes, open ground, reindeer and predators, with a tantalising but unproven human presence, on the threshold of more extensive ice.

Chapter 023 of 100

31178 BCE

Derryvree's Sealed Waters^[23]



Modern calendar-year precision is not available for Ireland in 31,178 BCE. No written calendar, settlement sequence or archaeological layer can identify a particular Irish event, person or season in that year. The date is a modern label, roughly 33,127 years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), a climatically unstable part of the last Ice Age. A responsible account must therefore work with calibrated ranges, sedimentary sequences and probabilities rather than narrate an annual chronicle. Radiocarbon years and calendar years are not interchangeable, and calibration becomes especially broad at this depth of time.

A Date Within a Long Environmental Record

The most valuable Irish evidence close to this nominal date comes from Derryvree, near Maguiresbridge in County Fermanagh. Road construction in 1969 exposed a drumlin: a streamlined hill formed by glacial action. Within it lay fine freshwater sands and organic silts enclosed between two tills, the stony and unsorted sediments left directly by glacier ice. The sequence gives a firm relative history. An earlier glacial phase had deposited the lower till; an interval then followed in which freshwater sediments and organic remains accumulated; a later ice advance covered and sealed the deposit beneath fresh till.

The organic material yielded the radiocarbon determination BIRM-166, conventionally dated to about 30,500 radiocarbon years before present, with a large published uncertainty of roughly a millennium either side. When considered through modern calibration, the deposit is commonly placed broadly within c. 36,900–31,700 calibrated years BP. The calendar label 31,178 BCE falls inside that wide bracket, but it

cannot be attached to an individual stratum, plant, insect or animal. Derryvree was not a one-day landscape preserved in mud. It was an environmental archive formed over an extended and changing interval.

This distinction is more than technical. It prevents the false impression that Ireland's deep past can be treated like a medieval annal. What Derryvree securely demonstrates is that, during part of later MIS 3, this Fermanagh locality was free of overriding ice long enough for a freshwater and wetland environment to develop. It also demonstrates that this living landscape was later buried by renewed glaciation. It does not demonstrate the weather on a particular day in 31,178 BCE, nor prove that every part of Ireland had the same conditions.

Cold Wetlands Beneath the Drumlin

The Derryvree fossils point to a cold, open and largely treeless environment. Plant remains, pollen and invertebrate evidence indicate wet ground, shallow pools, mosses, sedges, herbs and low-growing tundra vegetation rather than forest. Bogbean, a wetland plant with distinctive trifoliate leaves, is among the significant botanical finds. Such evidence evokes a mosaic rather than an empty frozen plain: waterlogged hollows and freshwater margins could sustain specialised plants and insects, while exposed ground beyond them endured severe seasonal conditions.

'Tundra' should not be imagined as a uniform modern Arctic replica. The evidence supports a periglacial landscape shaped by cold, frost action and short growing seasons, but local relief, drainage, snow cover and the proximity of water would have created ecological variation. Mosses and aquatic plants tell us that certain protected or wet places were productive in summer. They do not imply extensive woodland, settled farmland or a stable climate. The vegetation was part of a dynamic Ice Age system in which relatively milder episodes could be followed by sharp cooling.

This was also a regional landscape in transition. The lower and upper tills at Derryvree indicate that the locality stood between episodes of ice cover. Across Ireland, glacial erosion and later sediment deposition have destroyed, disturbed or deeply buried many land surfaces of this antiquity. That helps explain why the surviving evidence is so fragmentary. Freshwater deposits protected beneath a drumlin are exceptional precisely because they escaped complete removal until modern roadworks exposed them.

Before the Greatest Ice Expansion

At this approximate point in time, Ireland was approaching, but had not yet reached, the maximum expansion of the last British-Irish Ice Sheet. The Last Glacial Maximum is generally placed much later, broadly between about 26,000 and 20,000 years ago, though the timing, thickness and extent of ice differed between regions and reconstructions continue to be refined. The Derryvree succession is important because it proves an earlier ice-free or non-glacial interval at that particular site before later glacial advance transformed the landscape again.

Sea level was lower than today because vast quantities of water were locked in northern ice sheets. Yet lower sea level alone cannot establish a straightforward land bridge, easy journey or permanent route into Ireland. The configuration of coasts, ice margins, channels and exposed shelf changed through time, while stormy seas and cold terrain imposed formidable barriers. For Ireland, the evidence is stronger for changing environmental connectivity with Britain and continental Europe than for any securely mapped route used at this exact date.

Castlepook and the Animal World

County Cork offers a different kind of evidence. Castlepook Cave, near Doneraile, has yielded Ireland's most important pre-Last Glacial Maximum assemblage of large mammal remains. The cave deposits include material attributed to woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. This is compelling evidence that Ireland supported, at different times during the Late Pleistocene, a far broader mammal community than the later island fauna.

But the cave is not a neat snapshot of one herd or one season. Carnivores carried material into caves; animals may have died naturally; water moved sediments; and early excavations often lacked the recording standards expected today. Recent redating has shown that some older radiocarbon results from Castlepook and other southern Irish caves were substantially too young. The resulting lesson is methodological as well as chronological: a species list from a cave cannot automatically be treated as a contemporaneous community, still less be transferred without qualification to Derrynvree in Fermanagh.

Even so, Castlepook makes the wider ecological setting intelligible. Reindeer and lemmings are consistent with cold open habitats; mammoth and giant deer indicate large herbivores able to move across broad landscapes; hyaena, wolf and bear show that predators and scavengers were also part of the food web. Their presence implies seasonal movement, predation and carcass use, but it cannot reveal annual migration routes or population sizes in Ireland. This was not an economy in the human historical sense. It was an animal world responding to vegetation, climate and access across a changing north-west European geography.

The Human Question

A reindeer femur from Castlepook has made this period especially significant. A deep mark on it has been interpreted as a cut or chop made with a sharp stone implement while the bone was fresh. If that interpretation is upheld, it may indicate that Upper Palaeolithic people handled a reindeer carcass in Ireland around this broad period. It would be an exceptionally early trace of human activity on the island, far older than Ireland's better-established post-glacial human record.

The careful conclusion, however, must remain narrow. One marked bone is not a settlement, camp, hearth, tool assemblage, burial ground or proof of a permanent population. It does not establish whether people hunted the animal, scavenged it, removed hide or sinew, or processed meat elsewhere before a limb reached the cave. Nor does it demonstrate a continuous Irish population. The cave's disturbed history means that the date of the animal, the origin of the mark and the depositional history must each be assessed separately.

Accordingly, political affairs, diplomacy, named communities, formal religion and organised trade cannot responsibly be described for Ireland in 31,178 BCE. There is no evidence for leaders, territories, languages, monuments, ritual sites or artistic traditions on the island at this date. If people were present, comparative evidence from Upper Palaeolithic Europe makes small, mobile foraging parties a plausible model, but that is an interpretation drawn from elsewhere, not a demonstrated Irish social order. The reindeer bone can support a question about human visitation; it cannot support a biography of Ice Age Ireland.

What This Year Can Mean

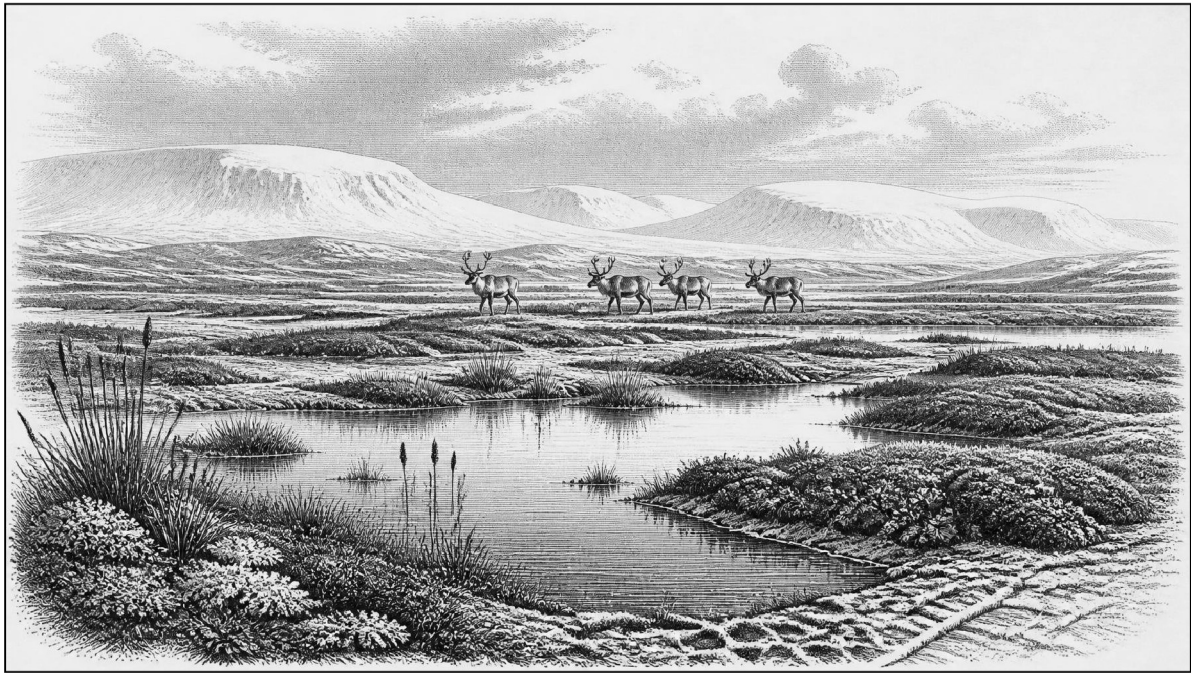
The most meaningful history of 31,178 BCE is therefore the history of a vulnerable landscape recorded by chance. In Fermanagh, freshwater silts beneath a drumlin preserve a cold wetland of pools, sedges, mosses, insects and sparse tundra vegetation. In Cork, cave deposits preserve a time-averaged record of animals that crossed or inhabited parts of Ireland during the Ice Age. Together they show that Ireland was neither an unchanging ice block nor a documented human homeland. It was an environmentally varied, climatically volatile edge of north-western Europe.

Renewed glaciation would later scour terrain, redirect drainage, bury older surfaces and remove much of the evidence that might once have recorded animal and human activity. Derryvree's sealed waters survived because glacier-laid sediment enclosed them; Castlepook survived because limestone caves retained bones and sediments, however imperfectly. Their value lies not in supplying an invented event for a numbered year, but in allowing Ireland's deeper prehistory to be described with appropriate precision, restraint and wonder.

Chapter 024 of 100

31177 BCE

Derryvree's Periglacial Marsh ^[24]



31,177 BCE is a modern calendar label, not a recoverable year in Ireland's prehistoric record. No known community on the island kept a calendar that can be aligned with this date, and neither archaeology nor Quaternary science can identify an event, person or season so precisely. The responsible history is therefore of a broad late-Pleistocene interval. In relation to the conventional scientific reference year of 1950, 31,177 BCE is approximately 33,126 years ago. It falls near the younger end of a calibrated date range associated with an exceptional deposit at Derryvree, County Fermanagh, but that association does not turn a sedimentary layer into an annual chronicle.

A Date Range, Not a Dateline

The relevant period belongs to the later part of Marine Isotope Stage 3, a cold and climatically unstable phase within the last glacial cycle. In Irish terminology it lies at the transition from the Middle Midlandian towards the Late Midlandian; in wider north-west European studies, it overlaps the early build-up of the British-Irish Ice Sheet. The familiar phrase "Last Glacial Maximum" should be used carefully here. Its principal maximum was still to come, broadly between about 27,000 and 21,000 years ago in Britain and Ireland, while maximum ice extent varied from sector to sector. Around 33,000 years ago, conditions were already severe and ice was growing, but Ireland was not necessarily a single, uniform expanse of ice.

The most important Irish evidence near this notional date is the Derryvree freshwater series, exposed during roadworks in 1969 in a drumlin about two kilometres north-east of Maguiresbridge. A drumlin is a streamlined hill made chiefly of glacial sediment. At Derryvree, investigators found a distinctive sequence: thick till below, freshwater silts and fine sands containing organic matter in the middle, and

another till above. Till is the unsorted mixture deposited directly by glacier ice. The sequence therefore establishes a basic order of events: an earlier glacial episode, an interval in which water and organic sediment accumulated at this locality, and renewed glacial deposition afterwards.

Organic material from the central deposit produced radiocarbon determination BIRM-166, conventionally dated to 30,500 years BP, with a substantial uncertainty of +1,170/–1,030 years. Radiocarbon years are not calendar years: changing atmospheric carbon-14 levels require calibration. Published calibration places this determination broadly at roughly 36,900–31,700 calibrated years BP. The calendar label 31,177 BCE, approximately 33,126 years before 1950, lies within that broad interval. Yet the range spans millennia. It cannot show that a particular pool, plant, animal or human action existed in Ireland in this exact numbered year.

Water Between the Tills

Derryvree matters because later ice did not completely destroy the evidence of an earlier landscape. Its fossil assemblage has been interpreted as showing open tundra vegetation and a periglacial climate: ground shaped by intense freezing and thawing beside, rather than necessarily beneath, glacier ice. The old term “muskeg”, used in discussion of the deposit, conveys a waterlogged, peaty terrain with wet hollows and shallow pools. This was not the familiar wooded Ireland of later millennia. It was a sparse, seasonal landscape in which low plants, mosses, sedges and herbs could exploit short growing seasons around freshwater.

The evidence is particularly valuable because it is ecological rather than picturesque. Plant remains, pollen and insects offer indirect records of local habitats. They can establish that biological communities existed at or near Derryvree, and that ice did not cover that precise ground continuously throughout the relevant interval. They cannot provide a map of the entire island at one moment. Nor can a wetland sequence be assumed to represent uplands, exposed coasts or the southern limestone country. Its strength is its stratigraphic clarity; its limitation is its local scale.

The upper till gives the deposit a further historical importance. It shows that the Derryvree wetland was eventually overtaken or sealed by later glacial activity. Ireland’s late-Pleistocene story was consequently one of changing opportunities rather than steady progression towards settlement. A locality could support standing water, insects and tundra plants during one interval, then be transformed by advancing ice, frost action, meltwater and sediment movement. Much evidence for earlier landscapes was scoured away, buried, mixed or carried offshore. What survives is unusually fragmentary.

An Island on the Edge of Ice Growth

Large-scale reconstructions of the British–Irish Ice Sheet indicate that around 31,000 years before present there were growing centres of ice in northern Ireland, Scotland and other upland regions, but also major uncertainties in the exact positions of their margins. By about 30,000 years ago, ice growth was more firmly under way across parts of the region. The later ice sheet would cover much of Ireland and extend far beyond modern shorelines in several directions. At the date considered here, however, the precise size and connections of Irish ice masses remain matters of reconstruction, constrained by landforms, marine sediments, radiocarbon dates, luminescence dating and numerical modelling rather than direct observation.

This uncertainty is historically meaningful. It rules out simple statements that all Ireland was either ice-free or ice-covered in 31,177 BCE. Local conditions could differ sharply. Sheltered low ground may have held freshwater sediment and tundra vegetation; uplands and northern districts may have supported expanding ice; and the continental shelves formed part of an altered, colder physical geography. Lower global sea levels changed coastlines, but geological research does not support an uncomplicated dry land bridge across the Irish Sea. Any movement of animals or people into Ireland therefore cannot be reduced to an assured overland route.

There were no political affairs in the historical sense that can be recovered from this evidence. No territories, rulers, diplomatic relations, wars, law codes or named communities are known. Equally, the language of “conflict” is unsuitable for interpreting glacial advance as though it were a human contest. The decisive forces were climate, ice dynamics, water and frost. Their effects nevertheless shaped the future human possibilities of the island by repeatedly removing habitats, redirecting rivers and modifying the terrain beneath later soils, bogs and settlements.

Castlepook and the Human Question

County Cork offers the other major line of evidence relevant to this deep period. Castlepook Cave, near Doneraile and also known as Mammoth Cave, has produced Ireland’s richest assemblage of pre-Last Glacial Maximum vertebrate remains. Its faunal record includes woolly mammoth, reindeer, giant deer, brown bear, wolf, foxes, mountain hare, lemmings and spotted hyaena. These animals should not be treated as a perfectly contemporaneous herd. Cave deposits accumulated over long periods, while carnivores, water, sediment disturbance and early excavations mixed material. Modern redating has shown that some older radiocarbon results from Irish cave bones needed substantial revision.

Even so, Castlepook demonstrates that Ireland could support, or at least receive, a cold-adapted fauna before the fullest expansion of the last ice sheet. Reindeer and mammoth evoke open grazing country rather than forest, while lemmings and Arctic fox point towards severe cold. Spotted hyaena is especially revealing: caves could be used by carnivores as dens or places where bones accumulated, not simply as human shelters. A bone assemblage is therefore not automatically evidence of hunting, residence or a settled population.

A reindeer femur from Castlepook bearing a deep incision has been interpreted as showing fresh-bone modification by a stone tool, perhaps during butchery. If that interpretation is confirmed, it may represent an exceptionally early Upper Palaeolithic human visit to Ireland, around 33,000 years ago. It is an important possibility, not a licence to invent an Ice Age village. The bone was recovered in antiquarian excavation, lacks an associated stone-tool assemblage or hearth, and comes from a cave sequence known to be complex. It cannot establish a permanent settlement, a population size, a migration route or the identity of the people who may have handled it.

Everyday Life Beyond the Evidence

The same caution governs society and economy. Upper Palaeolithic groups elsewhere in north-west Europe were mobile hunter-gatherers whose subsistence, technology and social organisation were closely adapted to seasonal resources. That regional context makes a brief Irish hunting or scavenging visit plausible if the marked Castlepook bone is genuinely human-modified. But analogy is not evidence that

such a group camped at Derryvree, exchanged goods across the Irish Sea, maintained trading partnerships or followed a known seasonal route. Ireland has no securely dated dwelling, hearth, lithic workshop, burial or personal ornament from this interval.

Nothing responsibly supports claims about religion, formal learning, ritual leadership, art or language in Ireland in 31,177 BCE. The absence is not proof that visiting people lacked symbolic lives; Upper Palaeolithic communities elsewhere certainly possessed complex cultural practices. It means only that no Irish material evidence of those practices has yet been securely tied to this period. The most honest cultural history is thus one of preservation and discovery: freshwater mud, pollen, seeds, insects, bone surfaces and stratified cave deposits are the surviving archives from which later researchers infer a vanished world.

For Ireland around this date, the central development was environmental volatility. Derryvree records a living but exposed freshwater tundra between phases of glaciation. Castlepook preserves traces of a changing Ice Age fauna and an unresolved possibility of human intervention. Together they reveal not a settled prehistoric society, but a northern Atlantic landscape at the edge of expanding ice: intermittently habitable, ecologically productive in restricted places, and repeatedly transformed before any continuous human history of the island can be demonstrated.

Chapter 025 of 100

31176 BCE

Castlepook's Spotted Hyena^[25]



Modern calendar-year precision is not available for Ireland in 31,176 BCE. The label is a convenient point on a deep prehistoric timescale, not a year that anyone could have recorded or recognised. In the conventional archaeological system of years before AD 1950, it falls about 33,125 years BP, within the Late Pleistocene and Marine Isotope Stage 3. The closest relevant Irish evidence comes from dated ranges, not annual events: above all, a cold freshwater deposit at Derrynree near Maguiresbridge, County Fermanagh, and the long-accumulated animal remains of Castlepook Cave near Doneraile, County Cork.

What can responsibly be described is an Ireland subject to sharp climatic fluctuations, local ice-free ground and an increasingly powerful glacial regime. It was not the wooded, settled island of later prehistory. Nor is there evidence for a political community, named people, language, religion, settlement network or trade system. The material record instead reveals changing habitats, animal movements and the remote possibility of brief human visits at Europe's north-western edge.

A Date Within a Range

The principal chronological difficulty is that radiocarbon years are not calendar years. The most important dated deposit for this broad horizon is the organic freshwater layer found beneath a drumlin at Derrynree. Road works in 1969 exposed fine sands and silts, including organic material, trapped between two distinct tills: sediments left by separate episodes of glacial action. The original radiocarbon determination, Birm-166, was 30,500 radiocarbon years BP, with a substantial laboratory uncertainty of +1,170/−1,030 years. Calibration against modern atmospheric curves converts such a measurement into a broad calendar range rather than a single date.

Recent glacial chronology modelling treats Derryvree as evidence for ice-free conditions around 33.5 $\pm$ 1.2 thousand calendar years BP. That range can illuminate the world around 31,176 BCE, but it cannot prove that a particular pool, herd or human party occupied the site in that numbered year. The same caution applies throughout this period. The apparent neatness of a BCE date should not conceal the uncertainty inherent in radiocarbon calibration, old excavations and deposits altered by later ice.

Derryvree Between the Tills

Derryvree offers unusually direct environmental evidence. The organic layer lay between a lower till and a later upper till, demonstrating a local sequence of glacial coverage, an interval in which freshwater sediment could accumulate, and renewed ice advance. It does not establish that all Ireland was ice-free at once. Rather, it documents one northern locality in which water, vegetation and insects persisted during a severe phase of the last glacial cycle.

Pollen, plant macrofossils, mosses and insect remains indicate open, treeless terrain. Grasses, sedges, herbs and juniper belonged to a cold tundra or muskeg-like landscape, with wet ground, decaying plant matter and shallow pools. Aquatic and waterside plants, including bogbean and water-milfoil, show that fresh water was available at least seasonally. The evidence is therefore more varied than a simple image of an unbroken white wilderness. There were productive wet hollows and a short growing season, but no basis for imagining dense forest, cultivated fields or permanent villages.

Periglacial conditions shaped this setting. The term does not mean that Derryvree lay under glacier ice; it describes ground affected by intense frost, freezing and thawing, sparse cover and proximity to glacial climates. Winters were harsh, summers brief, and vegetation low-growing. Insects reinforce that reading. Their remains point to wet, mossy ground and cold conditions rather than a temperate woodland. Such evidence gives Ireland's far past texture: sedge margins, shallow water and exposed open country where organic mud could gather before later ice sealed it below the drumlin.

Castlepook's Animal World

Nearly 300 kilometres to the south, Castlepook Cave preserves a different kind of archive. Also known as Mammoth Cave, it lies in limestone near Doneraile in north County Cork. Excavated principally in the early twentieth century, it produced more than 2,000 bones from a complicated network of galleries and chambers. Its named spaces — including Hyaena Hall and Elephant Hall — reflect the striking animals found there, but they should not be mistaken for a single living landscape or one excavated occupation floor.

Radiocarbon dates show that the cave received remains over a long span, roughly 45,700 to 19,950 radiocarbon years BP. Water movement, carnivore activity, natural deaths, disturbance and early excavation all mixed or obscured parts of the sequence. Castlepook is therefore a repository of many episodes. It cannot be read as a census of animals living together in one century, still less in 31,176 BCE. Yet it is Ireland's richest known pre-Last Glacial Maximum vertebrate site and is indispensable for understanding the range of life available in the broad period.

The assemblage includes woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyena. Some species signal cold, open habitats; others demonstrate that conditions and fauna altered through time. The spotted hyena is particularly significant. Its presence at Castlepook is Ireland's best evidence for a large social scavenger

and predator now absent from Europe. Hyenas could accumulate bones in dens, complicating the interpretation of any individual specimen while also revealing an ecosystem with sizeable herbivores and enough carrion or prey to sustain formidable carnivores.

Reindeer, mammoth and giant deer should not be treated as symbols of an eternal 'Ice Age Ireland'. Their remains record opportunities for movement and survival during changing climatic windows. Large herbivores could range across open ground, while predators followed or exploited them. The cave evidence shows that southern Ireland was connected ecologically to wider north-west European faunas at intervals, although it does not establish a continuously occupied land bridge or a fixed route from Britain or the Continent. Sea level was lower than today, but ice extent, local topography and changing coastlines made access variable and difficult to reconstruct.

The Human Question

The most consequential archaeological issue concerns a reindeer femur from Castlepook. In 2021, analysis publicised a deep mark on the bone as a probable incision made by a stone tool during butchery; the bone was reported as about 33,000 years old. If that interpretation is confirmed, it may be the earliest indication that people handled an animal in Ireland, vastly earlier than the well-established Mesolithic settlement of the early Holocene.

That is an important possibility, but it must remain a possibility. A date on bone establishes when the animal lived or died, not necessarily the precise moment when a surface mark was made. Identifying a cut mark requires taphonomic judgement: researchers must distinguish deliberate stone-tool damage from carnivore teeth, trampling, breakage, abrasion and other natural processes. Castlepook has not yielded a securely associated stone-tool assemblage, hearth, dwelling, burial, human bone or artwork from this horizon. Nor does one potentially butchered reindeer demonstrate continuous population, a named migration, language, kin group or territorial claim.

If people did reach Ireland in this broad period, the wider European comparison suggests highly mobile Upper Palaeolithic hunter-gatherers, travelling in small groups and using animal resources, shelter and seasonal knowledge. That is interpretation based on better-documented societies elsewhere, not a description of a proven Irish camp. A responsible account therefore separates the direct evidence — an animal bone, its reported mark and its age — from the larger hypothesis of a brief visit or carcass-processing episode.

No States, No Diplomacy

Political affairs, warfare, diplomacy and formal religion leave no identifiable trace in Ireland at this depth of time. There were no known kingdoms, monuments, farms, roads, writing systems or institutions. It would be misleading to fill those absences with imagined tribal politics. Likewise, there is no evidence for exchange networks, although animal movements and lower sea levels indicate that Ireland was part of a changing north-west European environmental zone rather than an isolated world.

Everyday life can be approached only conditionally. Derryvree proves that freshwater habitats and plant communities existed; Castlepook proves that large mammals and predators occurred over the wider interval. Together they show ecological potential amid severe constraints. They do not prove that humans lived beside the Fermanagh pools or sheltered regularly in the Cork caves. Later ice-sheet growth would erase, bury and rework much of the earlier landscape, helping to explain why the archaeological record is so sparse.

An Iceward Landscape

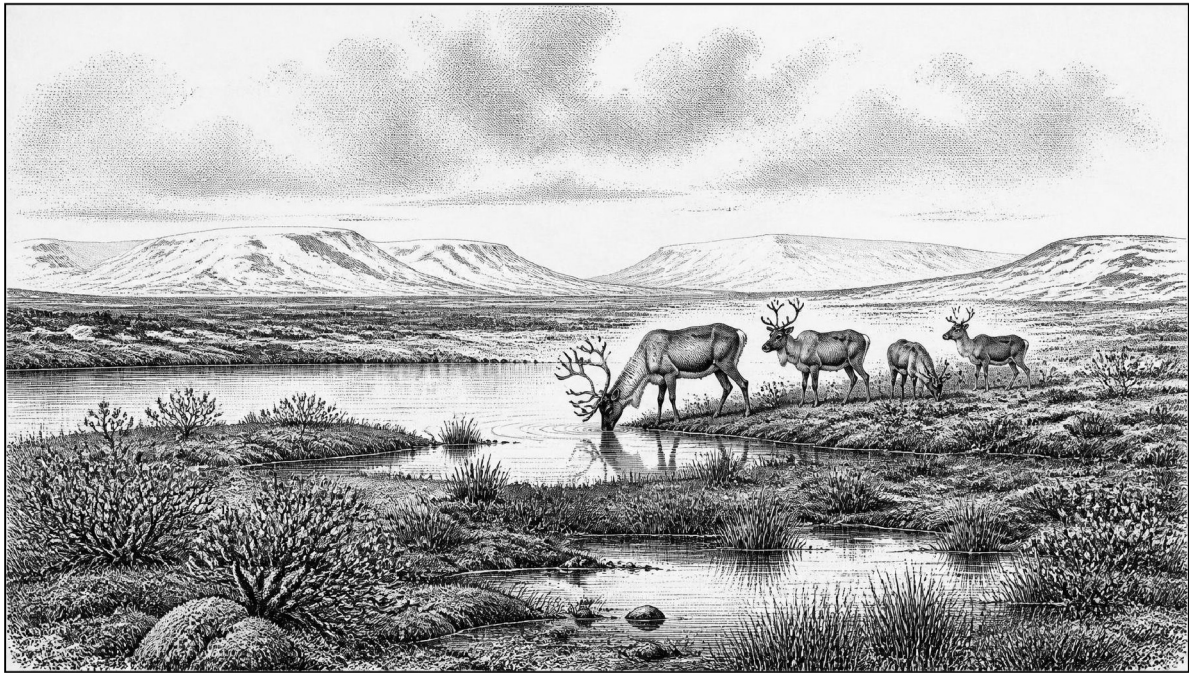
In the longer environmental story, this was an iceward interval. Ireland had not yet reached the Last Glacial Maximum, when the British–Irish Ice Sheet attained its greatest extent, broadly between about 27,000 and 21,000 years ago in a widely used model. Around the Derryvree horizon, conditions were already cold and unstable, but the evidence for freshwater deposits confirms that ice cover was episodic and regionally varied. Later expansion of ice radically reshaped the island, excavating basins, depositing till and destroying or concealing older surfaces.

For 31,176 BCE, then, the most meaningful Irish history is not an invented event but a fragile record. Beneath a Fermanagh drumlin, organic silts retain the evidence of a cold wetland; in a Cork cave, bones preserve traces of an animal community that included reindeer, mammoth and spotted hyena. A debated reindeer incision raises the prospect of a fleeting human encounter. These are not the foundations for an annual chronicle, but they are profound evidence that Ireland's human and environmental past reaches far beyond the later worlds of farmers, monuments and recorded history.

Chapter 026 of 100

31175 BCE

BIRM-166's Treeless Interval^[26]



The label “31,175 BCE” is a modern chronological convenience, not a date that people in Ireland could have recognised or recorded. There is no annual historical record for this depth of time: no named community, ruler, battle, treaty, settlement or calendar. At best, the notional year falls roughly 33,100 years before AD 1950, within the later part of the Late Pleistocene and Marine Isotope Stage 3. The responsible history of Ireland at this point must therefore be written in broad calibrated ranges, geological sequences and cautiously interpreted animal remains.

A Date Within a Range

The nearest securely relevant Irish evidence is not a document or artefact but a buried freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and revealed silts and fine sands containing organic remains between two separate layers of till, the unsorted sediment left by glacier ice. The order of events is clear: ice deposited a lower till; an interval without local glacier cover allowed water and vegetation to accumulate sediment; then a later ice advance laid down an upper till and sealed the earlier landscape.

Organic material from the Derryvree deposit, laboratory sample BIRM-166, produced a conventional radiocarbon determination of about 30,500 radiocarbon years before present, with a substantial uncertainty. Modern calibration places the result broadly between about 36,900 and 31,700 calibrated years before present, approximately 34,950–29,750 BCE. The year considered here falls within that broad span, but cannot be pinpointed to a layer, season or event. BIRM-166 does not tell us what happened in Ireland in one numbered year; it establishes that, during part of this interval, north-central Ireland included an ice-free freshwater environment.

This distinction matters. A radiocarbon result dates the death of organic material within a probability range; calibration converts it into a further range of possible calendar ages. It is not a timestamp for an entire landscape. Nor does an organic bed beneath later till prove that every part of Ireland was open ground at once. Ice margins, uplands, coasts, lakes and lowlands responded differently to changing snowfall, temperature, sea level and the movement of the developing British–Irish Ice Sheet.

Fermanagh's Cold Wetland

Derryvree is nonetheless an unusually vivid environmental archive. Pollen, plant macrofossils and insect remains from the freshwater silts point to a treeless, severe periglacial setting sometimes described as muskeg: wet, peaty or mineral-rich ground with pools, sedges, mosses and low-growing tundra plants rather than forest. The evidence includes taxa suited to cold, open conditions, among them dwarf willow, mountain-avens, Arctic clubmoss and aquatic plants. Their presence does not supply a picturesque snapshot of a particular day, but it demonstrates that life persisted in and around fresh water between episodes of glaciation.

The landscape was likely patchy. Water collected in hollows and shallow basins; saturated ground alternated with exposed mineral soil; frost, snow cover, thaw and seasonal runoff continually remade the surface. Such places could be biologically productive in a cold climate, sustaining plants, invertebrates and animals even while the wider region faced intensifying climatic instability. The Derryvree sequence is especially valuable because later ice did not merely pass nearby: it buried the wetland, preserving traces that would otherwise have been eroded or dispersed.

Farther west in Fermanagh, organic deposits at Greenagho also demonstrate ice-free conditions in part of the region earlier in the last glacial cycle. Together, these records rule out a simple picture of Ireland as continuously entombed beneath one unchanging ice sheet. They instead show a long and uneven history of glacier advances, retreats or stagnation, open-water habitats and renewed burial beneath ice.

Before the Greatest Ice Expansion

At roughly this horizon, the last Irish ice sheet was growing but had not yet reached the later maximum documented across much of Ireland and the surrounding continental shelf. Current reconstructions indicate a major build-up from about 30,000 years ago, with different sectors reaching maximum positions broadly between about 27,000 and 24,000 years ago. The timing was regional rather than uniform. Ice in the Irish Sea sector, for example, had its own advances, flow changes and margins, while inland Irish ice developed according to a different topography and supply of snow.

For around 31,175 BCE, then, the safest description is neither “Ireland was ice-covered” nor “Ireland was ice-free”. The evidence instead supports an island-region in transition. Some localities had been, or were, capable of supporting freshwater tundra environments; elsewhere ice could have occupied uplands or moved through basins. Over subsequent millennia, the last major glaciation would erase much of the exposed ground, alter drainage and redistribute sediments on a vast scale.

Sea level was far lower than it is today because immense quantities of water were held in global ice sheets. Coastlines around north-west Europe consequently lay beyond their modern positions, and the geography of the Irish Sea and Atlantic shelves was profoundly different. Yet it would be unsafe to draw a precise shoreline or assert a particular land bridge for this specific year. Lower sea level could facilitate animal dispersal across changing coastal landscapes, but local sea passages, ice fronts and rivers remained dynamic obstacles.

Castlepook's Animal World

The principal complementary evidence comes from Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. Excavated principally in the early twentieth century and now the subject of renewed investigation, it has yielded Ireland's richest major assemblage of late cold-stage mammal remains. The collection includes reindeer, woolly mammoth, giant deer, brown bear, wolf, foxes, Arctic fox, lemmings and spotted hyaena. The National Museum of Ireland rightly treats Castlepook as a site of exceptional importance for the island's Ice Age fauna.

These animals should not be imagined as one herd or one perfectly simultaneous community. Cave collections can mix material deposited over long periods, and early excavations often lacked the stratigraphic methods expected today. Modern redating has shown that some earlier radiocarbon results from Castlepook require revision, with certain animals proving considerably older than once thought. The faunal record therefore establishes repeated occupation or passage through Ireland during favourable intervals, rather than a census of the island in 31,175 BCE.

Even so, the assemblage transforms our understanding of the possible landscape. Reindeer and lemmings are consistent with cold, open environments; mammoth and giant deer indicate a much richer large-mammal fauna than later Ireland possessed; hyaenas and wolves reveal predators and scavengers within the same wider ecological network. Their arrival required intermittent terrestrial connectivity, or at least routes through landscapes no longer visible above modern seas. Ireland was not biologically isolated in the way its later island geography might suggest.

The Human Question

A reindeer femur from Castlepook has been presented as bearing an incision consistent with a sharp stone tool and has been associated with an age of roughly 33,000 years ago. If that interpretation is sustained, it may be evidence that a person processed an animal in Ireland during this general phase of the Ice Age. It is an important possibility, but it must remain proportionate to the evidence. A dated animal bone and a possible cut mark do not establish a permanent population, a camp, a hunting territory or a named cultural tradition.

No securely associated house floor, hearth, lithic assemblage, cemetery, art panel or stratified butchery area of comparable antiquity has yet been recovered in Ireland. The point is not to deny the possibility of Upper Palaeolithic visitors. Groups elsewhere in north-west Europe possessed sophisticated knowledge, stone-working traditions and social worlds. Rather, the Irish evidence cannot yet show which groups, if any, crossed to the island, how often they came, or whether their visits continued beyond a single episode. Any claim about boats, clothing, family life or seasonal reindeer hunts in Ireland at this date would be informed conjecture, not direct history.

What History Can and Cannot Say

There are no recoverable political affairs for Ireland around this point: no politics, diplomacy, warfare, law, territorial boundaries or leaders. Nor is there evidence for religion, formal learning, language, trade partnerships, monuments or artistic traditions on the island at this time. Agriculture,

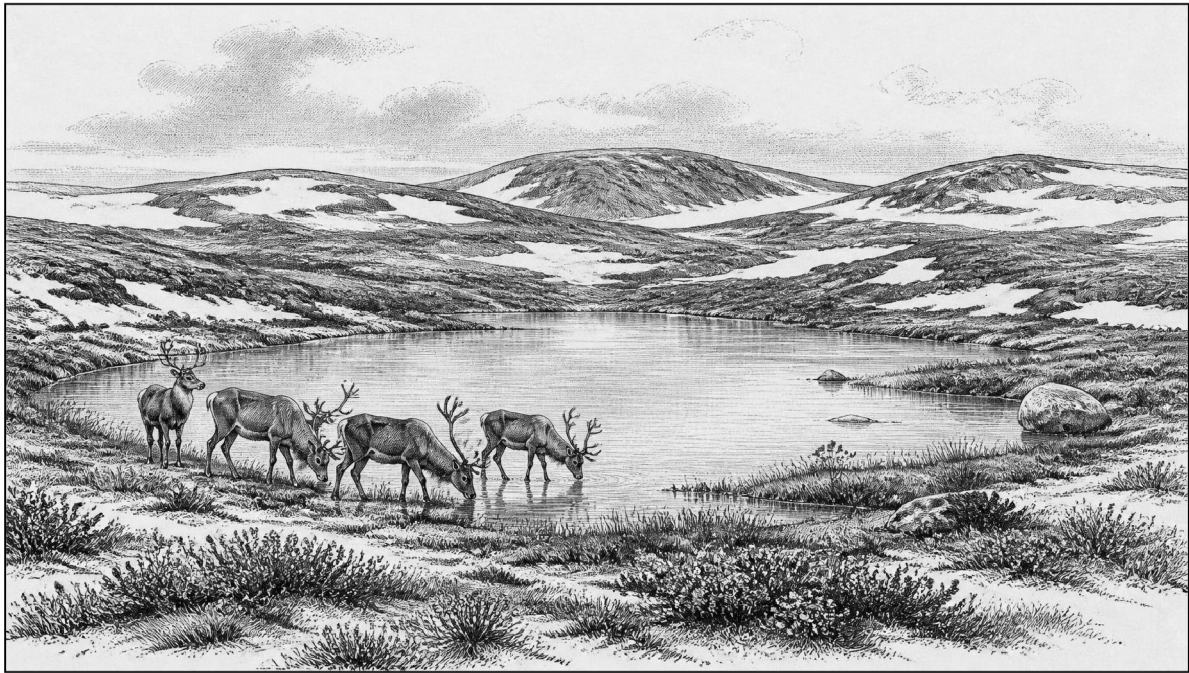
livestock keeping and settled village life lay many millennia in the future. The economy visible in the evidence is ecological rather than human: plants colonising exposed ground, animals moving through available habitat, predators exploiting prey, and ice repeatedly reshaping access to land and water.

The most important development is therefore environmental. BIRM-166 records a living freshwater tundra wetland in Fermanagh during a broad interval that includes the modern date label 31,175 BCE. Castlepook records an Irish Ice Age fauna connected to wider European ecosystems. The expanding ice sheet provides the larger setting, both creating and destroying habitable terrain. Together these traces reveal not an annual chronicle but a changing, treeless Ireland: wet ground and cold pools under open skies, large mammals on shifting ranges, and a fragile archive soon to be overridden by ice.

Chapter 027 of 100

31174 BCE

Castlepook's Reindeer Problem^[27]



31,174 BCE is a modern calendar label, not a date that can be matched to a recorded Irish event, individual or season. At this depth of time, archaeology works in broad probability ranges rather than annual history. In calendar arithmetic the label falls about 33,123 years before AD 1950, the conventional radiocarbon reference point: roughly 33.1 thousand calendar years before present (cal BP). It belongs to the Late Pleistocene, within Marine Isotope Stage 3, when climate across north-west Europe repeatedly shifted between severe cold and comparatively milder intervals. No Irish evidence can responsibly identify what happened in this particular year.

The most useful approach is therefore to ask what the surviving evidence can illuminate about Ireland around this broad horizon. It reveals neither a nation nor a settled society, but a changing northern landscape in which ice, open vegetation, wetlands and large mammals all mattered. It also presents a tantalising, unresolved question about whether people briefly entered Ireland long before its securely documented post-glacial settlement.

A Date with Wide Margins

The distinction between radiocarbon years and calendar years is essential. Atmospheric carbon-14 has varied through time, so a laboratory result must be calibrated against independently dated records. Even with the IntCal20 calibration curve, which extends to 55,000 cal BP, uncertainty at about 33,000 years ago is substantial. A nominal year such as 31,174 BCE cannot be converted into a meaningful day, decade or biography.

Irish deposits of this age are especially difficult because later glaciers eroded, reworked or buried earlier landscapes. The closest major environmental anchor is Derryvree near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and exposed freshwater silts and fine sands

between two thick sheets of till, sediment laid down directly by glacier ice. This sequence establishes an important order: an earlier ice advance; an interval when ice was absent from that locality and a wetland or shallow pool accumulated sediment; then a later advance that sealed the deposits beneath fresh till.

Organic material from the Derryvree bed gave a conventional radiocarbon age of 30,500 years BP, with a large uncertainty of +1,170 and –1,030 years. Calibration places the deposit within a wide late-Pleistocene span, rather than at a pinpoint date. The calendar label in question falls plausibly within that broad window, but it cannot be attached to an individual plant, animal or moment in the Derryvree basin. The value of the site lies in its environmental testimony, not a year-by-year chronicle.

Fermanagh's Treeless Wetlands

The Derryvree fossils describe a cold, open and wet environment. Freshwater mosses, sedges and aquatic plants occurred around standing or slow-moving water. Insect remains, including beetles associated with northern climates, reinforce the picture of periglacial conditions: ground subject to freezing and thawing, short growing seasons and little or no woodland. Mountain-avens, dwarf willow, clubmoss and other cold-tolerant vegetation recorded in comparable Irish inter-till deposits indicate a patchwork of tundra-like ground, sedgy mire, damp hollows and sparse shrub cover rather than the familiar green, wooded Ireland of later millennia.

This does not mean every part of the island looked identical. Ireland's uplands, lowlands, coasts and sheltered limestone districts responded differently to climate and to the shifting margins of ice. The absence of an ice sheet at Derryvree while its freshwater bed formed does not prove that all Ireland was ice-free. Nor does a single site allow annual temperatures to be calculated for the whole island. It does demonstrate that, during part of the Middle Midlandian cold stage, north-western Ireland contained exposed ground capable of supporting freshwater ecosystems.

Evidence from Crag Cave in County Kerry adds a longer perspective. Episodes of speleothem growth in the cave show that liquid water was at times able to circulate through the shallow karst system during the last glacial period. Such growth is consistent with intervals in which mean annual conditions locally rose above freezing. It reinforces the central point: this was not a uniform, unbroken deep-freeze. Abrupt climatic oscillations shaped the opportunities available to plants, animals and any human visitors.

Ice Was Building, Not Yet at Its Maximum

At roughly 33,000 cal BP, the British–Irish Ice Sheet was in a phase of expansion, not at its later maximum. The latest large-scale reconstruction identifies steady ice-sheet growth between 31,000 and 26,000 years ago, followed by maximum volume around 23,000 years ago. Those figures are modelled at thousand-year resolution and should not be treated as a precise map for 31,174 BCE. They nevertheless provide the appropriate setting: Ireland was entering a long deterioration towards more extensive glaciation.

That distinction matters. Ireland was neither the wholly ice-smothered island often imagined for the Ice Age nor a stable open plain. Ice centres, mountain glaciers, frozen ground, rivers swollen by seasonal melt and exposed lowlands all changed through time. The later ice sheet would scour much of the evidence away, which helps explain why the record for this period is fragmentary. What survives is disproportionately found in caves, beneath tills, or in sediments sealed from erosion.

The Castlepook Evidence

Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork is the crucial southern Irish site. Excavations in the early twentieth century recovered a remarkable assemblage from its limestone passages: woolly mammoth, reindeer, giant deer, brown bear, wolf, foxes, mountain hare, lemmings and spotted hyaena. The National Museum of Ireland regards Castlepook as the country's most important site for mammal remains from the last cold stage. Direct dates and re-dating programmes show that the collection represents a long span of time, not one simultaneous animal community.

The fauna supports an image of periodically open country capable of sustaining grazing and browsing herbivores, as well as predators and scavengers. Reindeer are especially appropriate to cold, exposed habitats; lemmings and Arctic fox point in the same direction. Mammoth and giant deer were present in Ireland during parts of the Late Pleistocene, although individual bones cannot be assumed to be contemporary merely because they came from the same cave. Cave deposits may be assembled by carnivores, water movement, animals dying in fissures, sediment collapse and excavation practices that did not preserve the contextual detail expected today.

A reindeer femur from Castlepook has made this period unusually important. It has been publicised as dating to about 33,000 years ago and bears a surface mark interpreted as a possible stone-tool cut from carcass processing. If that interpretation is confirmed, it would be evidence for a person or small group handling a reindeer in Ireland roughly within the broad period represented by 31,174 BCE. It would not establish a village, a permanent population, an ethnic identity or a named Upper Palaeolithic culture.

Caution is not a dismissal of the find. The bone is genuinely significant precisely because it is testable. Yet it derives from an old collection rather than a securely excavated occupation floor, and no directly associated hearth, stone-tool scatter, dwelling, human bone or clearly defined butchery place of comparable age has been recovered. Current Castlepook investigations are seeking stratified deposits and additional evidence. Until such evidence is published and independently assessed, the responsible conclusion is that the femur is a compelling indication of possible human activity, not proof of enduring settlement.

People Beyond the Evidence

There can be no political history for Ireland at this date. No rulers, territories, diplomatic relationships, laws or conflicts are known. There is likewise no evidence for farming, pottery, metalwork, monuments, boats, exchange networks or religious practice in Ireland around 33,000 cal BP. It would be misleading to fill those silences with generalisations from later Irish prehistory.

If people did reach Castlepook's landscape, comparative Upper Palaeolithic evidence from north-west Europe suggests highly mobile hunter-gatherers able to exploit seasonal animal resources and to use stone tools, hides, bone and fire. That is an interpretation drawn from other regions, not an excavated Irish camp. The Castlepook mark alone cannot tell us whether a reindeer was hunted, scavenged, butchered elsewhere and carried to the cave, or encountered by one person rather than a group. It cannot identify language, belief, kinship, artistry or the duration of a visit.

Travel routes are similarly uncertain. Lower global sea levels altered the seas around Ireland, but local relative sea level was affected by changing ice loads and land movement. Animal dispersal demonstrates that Ireland was not ecologically isolated throughout the Late Pleistocene; it does not by itself prove a

particular land bridge or human route at this date. Any human presence would have existed at the far north-western edge of wider European population movements and would have been vulnerable to the worsening climate and the advance of ice.

An Environmental, Not National, Past

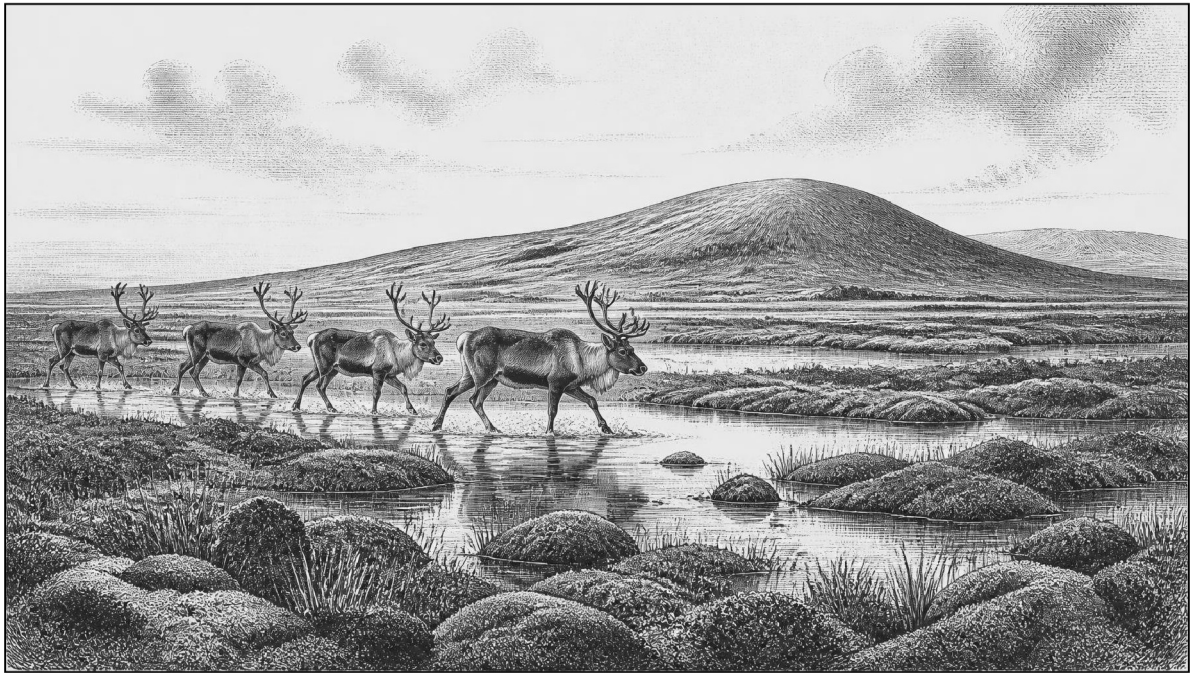
The most substantial history available for around 31,174 BCE is environmental. Fermanagh preserves evidence of cold freshwater wetlands between glacial episodes. Cork caves preserve a varied cold-stage fauna and an intriguing, still unconfirmed case for human butchery. Across Ireland, the approaching growth of the British–Irish Ice Sheet was remaking habitats and ultimately erasing many of their traces.

That is enough to make this remote date historically meaningful. It locates Ireland within the dynamic late-Pleistocene world of tundra vegetation, migrating mammals, carnivore dens, cave sediments and rapidly changing ice margins. But it also sets firm limits. Around this point in time there is no evidence for an Irish people, polity or continuous settlement. There is instead a landscape intermittently habitable for animals, and perhaps briefly visited by humans, whose faintest surviving traces remain open to investigation.

Chapter 028 of 100

31173 BCE

The Awbeg Reindeer Enigma^[28]



“31,173 BCE” is a useful modern label, not a year that anyone in prehistoric Ireland could have named, recorded or experienced as a calendar date. In scientific terms it falls roughly 33,100 years before present, where “present” conventionally means 1950. Archaeology cannot identify an event in this single year. The responsible picture is therefore one of overlapping, calibrated ranges, sedimentary sequences and cautiously interpreted animal remains. Around this point in the Late Pleistocene, Ireland lay within the long cold phase known locally as the Midlandian and internationally within Marine Isotope Stage 3. It was not yet at the fullest extent of the Last Glacial Maximum, but climate was unstable, ice was growing in the wider region, and habitable ground could be temporary and unevenly distributed.

A Date Within a Range

The most relevant Irish chronological evidence comes from deposits whose dates span centuries or millennia. At Derryvree, near Maguiresbridge in County Fermanagh, road works exposed organic freshwater silts and sands sealed between two tills: sediment laid down by ice. The order of the layers provides the essential fact. There had been glaciation, then an interval when this locality supported fresh water and organic accumulation, followed by renewed glaciation. A conventional radiocarbon determination from the organic series was 30,500 radiocarbon years BP, with a substantial uncertainty. When calibrated, estimates for the sequence extend broadly through the later part of Marine Isotope Stage 3, with one published reconstruction placing it about 36,900–31,700 calibrated years BP.

That is the scale at which this history must be written. The date in the heading falls within a broad window relevant to Derryvree, but it cannot be attached to the formation of a particular pool, the passage of a particular animal, or an individual human visit. Nor does Derryvree prove that every part of Ireland

was ice-free at once. It is a local archive beneath a drumlin, extraordinarily valuable precisely because later ice buried rather than entirely removed it. Its evidence establishes conditions at and around one northern locality; regional reconstruction requires comparison with other deposits, cave records, landforms and offshore evidence.

Fresh Water Between the Tills

The Derryvree sediments offer the closest Irish glimpse of the living landscape relevant to this date. Fossil pollen, plant macrofossils and insects indicate a cold, open setting, conventionally described as treeless tundra or muskeg. This was not an empty snowfield. It included wet, moss-rich ground, sedges and grasses, low herbs and dwarf shrubs, with shallow pools, waterlogged channels and patches of exposed mineral soil. Aquatic and waterside plants demonstrate that unfrozen water persisted seasonally or locally long enough for a freshwater community to develop.

Such evidence supports a landscape of strong contrasts. Winters were severe and growing seasons short; frost, snow cover, waterlogging and seasonal thaw would all have shaped where plants could grow. Yet wet hollows could be productive places. They trapped organic matter, sheltered insects and supported the plants on which larger food webs depended. The term “tundra” should not suggest a uniform plain. Even in a generally open environment, differences in drainage, slope, soil and snow accumulation would have created a mosaic of pools, sedge margins, grassy ground and sparse shrub cover. The later Irish Ice Sheet would remodel or erase much of this terrain, which is one reason intact environmental sequences are so rare.

Elsewhere, inter-till and organic deposits in northern Ireland, including Greenagho near Belcoo and Aghnadarragh by Lough Neagh, reinforce the larger conclusion that ice cover during the Midlandian was episodic rather than permanently uniform. Their sequences record climatic oscillation and changing depositional environments. They should not be treated as duplicate snapshots of the same year, but together they show an Ireland repeatedly affected by the advance, decay and renewed growth of glacier ice.

The Animals of an Open Country

At Castlepook Cave near Doneraile in north Cork, south of the Awbeg valley, excavations recovered Ireland’s richest known assemblage of pre-Last Glacial Maximum vertebrate remains. The collection includes woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. These remains are direct evidence that such animals reached Ireland during parts of the Late Pleistocene. They also reveal a food web suited to open, cold-country habitats: grazers and browsers, small mammals, scavengers and predators.

There is an important limit, however. A cave bone collection is not a census taken on one day. Bones may have arrived through carnivore activity, natural death, water movement or disturbance during early excavations. Species represented in the same cave need not have lived there simultaneously, and the cave was not necessarily a dwelling place for every animal whose remains entered it. Modern reassessment of old radiocarbon measurements has also shown why apparent precision must be treated sceptically: some earlier dates from Castlepook require revision, and the chronological relationship between particular specimens is not always secure.

Nevertheless, the assemblage makes the broad setting vivid. Reindeer could have found forage across open country; lemmings and Arctic fox indicate cold-adapted ecological conditions; hyaenas, wolves and bears demonstrate that Ireland was connected, at least intermittently, to wider north-west European animal populations. Sea levels were much lower than today, exposing extensive shelf landscapes. Ireland was not necessarily an island in the modern geographical sense, although ice margins, rivers, coasts and changing sea level made movement routes variable and difficult. Animal dispersal was possible in windows that later closed.

A Possible Human Trace

The most arresting evidence relevant to this period is a reindeer femur from Castlepook. Reported work on the bone identified a mark interpreted as having been made by a sharp stone tool while fresh tissue was being cut. The specimen has been publicly associated with an age of about 33,000 years ago, placing it broadly near the date represented here. If the interpretation and association are sustained, it is evidence that a person, or a very small group, processed a reindeer in Ireland during the Upper Palaeolithic, much earlier than the formerly accepted evidence for human activity on the island.

Its importance is matched by the need for restraint. One marked bone is not proof of a permanent population, a village, a named people or continuous occupation. Castlepook has not yielded a securely associated stone-tool assemblage, hearth, built shelter, human burial, artwork or durable occupation surface of this age. Nor is there evidence sufficient to assign any possible visitors to a particular continental archaeological tradition such as the Aurignacian or Gravettian. The femur may record a brief episode of hunting, scavenging or carcass processing at the far north-west of the Upper Palaeolithic world; it cannot tell us how long people stayed, whether they returned, or how they travelled.

The distinction matters especially when considering everyday life. A party capable of processing a reindeer would have possessed practical knowledge of meat, marrow, hide, sinew, bone and perhaps antler. They would also have needed clothing, fire-making knowledge, social co-operation and strategies for surviving exposed country. These are reasonable inferences from Upper Palaeolithic life elsewhere in Europe, not things demonstrated by the Castlepook bone itself. No Irish evidence from around this date identifies houses, family groups, seasonal camps or a local technology.

No Politics, No Diplomacy

Political affairs, formal conflict, diplomacy, religion and learning cannot responsibly be recovered for Ireland around 31,173 BCE. There were no states, kingships, written records, monuments or institutions known from the island at this time. Nor is there evidence for organised warfare. If humans were present, their social world was almost certainly that of mobile hunter-gatherers operating in small groups, but even that description is an archaeological model rather than a fact established for a particular Irish community.

Trade is similarly beyond demonstration. The lower-sea-level geography of north-west Europe made movements of animals and people more feasible than they are now, but no securely dated Irish exchange network belongs to this point. The essential regional change was environmental: fluctuating climate and expanding ice repeatedly altered corridors, coastlines and habitable zones. These processes governed opportunity more profoundly than any identifiable political decision could have done.

What the Evidence Can Say

For this notional year, Ireland's history is therefore a history of traces rather than events. The Derryvree organic beds show that cold-stage freshwater habitats existed in at least one part of the island during a broad interval encompassing this date. Castlepook's bones show that a varied Ice Age fauna reached southern Ireland during Marine Isotope Stage 3. The disputed or provisional human significance of a cut-marked reindeer femur raises the possibility of a remarkably early human visit, but does not yet demonstrate settlement.

These fragments are significant because subsequent glaciation was destructive. Ice scoured bedrock, transported sediment and rearranged older deposits, leaving an incomplete archive. The absence of a settlement should not be mistaken for proof that people never came; equally, a single possible butchery mark should not be enlarged into a lost society. Around 31,173 BCE, the most secure image is of a cold, open and changing Ireland: wetlands in sheltered basins, mobile animal populations, uncertain human contact, and a landscape increasingly vulnerable to the ice that would later reshape it.

Chapter 029 of 100

31172 BCE

Awbeg Before the Ice^[29]



The label 31,172 BCE is useful for arranging a modern chronology, but it cannot identify an event in Ireland on that particular year. There were no written calendars, dated settlements or named communities from which such precision could be recovered. In archaeological terms, the nominal year falls roughly 33,120 years before AD 1950, the conventional “present” of radiocarbon science, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3). That was a long, climatically unstable part of the last Ice Age, not a moment that can be isolated in an Irish historical narrative. The responsible account is therefore one of calibrated ranges, deposits and probabilities.

Ireland at this time was approaching, rather than already securely within, the Last Glacial Maximum. The maximum extent of the British–Irish Ice Sheet came much later, principally around 26,500–19,000 calibrated years BP, although the expansion of ice was neither uniform nor simultaneous in every region. Reconstructions of the ice sheet show important uncertainty in its earliest growth. A date equivalent to 31,172 BCE must not be used to claim confidently that the whole island was either ice-free or covered by a single continuous ice mass. Conditions and ice margins changed over centuries and millennia, while later glaciers erased much earlier evidence.

Cold Ground Between the Tills

The closest Irish environmental evidence comes from the north. At Derryvree, near Maguiresbridge in County Fermanagh, road works exposed freshwater silts and fine sands sealed between two layers of glacial till. The organic deposit produced a radiocarbon determination of 30,500 +1,170/–1,030 radiocarbon years BP. Its calibrated equivalent is broad, commonly expressed as approximately 36,900–

31,700 cal BP. That span encompasses the notional date considered here, but it is vital not to mistake a long-lived deposit for an annual record. Derryvree demonstrates that part of northern Ireland supported a cold freshwater environment during later MIS 3; it does not describe what happened in 31,172 BCE itself.

Its plant and insect remains provide a rare local view. Pollen was largely herbaceous, while macrofossils included sedges, mosses and aquatic plants. Cold-adapted beetles added to the picture. Together, these traces indicate open tundra or muskeg-like ground, shallow pools and wet margins affected by severe seasonal freezing. The landscape was not the wooded island familiar from later prehistory. A few tree-pollen grains cannot prove nearby forest, since wind can carry pollen over long distances. The stronger inference is sparse vegetation, short growing seasons and exposed terrain broken by wet hollows rather than continuous woodland.

A Changing Irish Landscape

Such evidence reveals an Ireland of contrast. Water could persist in protected basins despite a periglacial climate, allowing mosses, sedges and small aquatic plants to survive. Elsewhere, frost action, wind and thin soils would have limited cover. Rivers, slopes and coastlines also differed from those of today: much water was locked in northern ice sheets, sea level was lower, and land now beneath the Irish Sea formed part of a wider, changing physical world. Whether particular dry-land routes connected Ireland, Britain and continental Europe at this precise time remains uncertain. Low sea level made wider connections possible in some reconstructions, but ice, water depth and changing topography prevent a simple assertion of a reliable land bridge.

The northern Fermanagh record should not simply be projected across every county. Ireland's Atlantic setting, varied relief and the developing ice sheet produced regional variation. Southern caves preserve one kind of evidence, northern inter-till sediments another. The most defensible general conclusion is that at least some Irish landscapes were capable of supporting cold-adapted plants and animals during MIS 3, before renewed glaciation buried or destroyed many of the deposits that might otherwise have told a fuller story.

Animals in the Southern Caves

Southern Irish caves, especially Castlepook Cave near Doneraile in County Cork, are central to this reconstruction. Modern re-dating has shown that some cave faunas once thought younger belong substantially earlier, in MIS 3. Reindeer, woolly mammoth, giant deer, brown bear, Arctic fox, hare, wolf and spotted hyaena are among the animals represented in the wider Irish Pleistocene record. Not every species need have occupied the same place at the same time, and cave assemblages are not ordinary census lists. Carnivores can drag prey remains into caves; water, collapse, excavation methods and nineteenth- and early twentieth-century collecting can mix material from different deposits.

Nevertheless, the fauna establishes a powerful ecological point. Ireland was not necessarily an empty, featureless ice desert before the Last Glacial Maximum. It intermittently supported sizeable herbivores and predators within a cold, open environment. Reindeer are particularly appropriate indicators of such conditions, though their presence does not establish a modern Arctic climate in every respect. Mammoth and giant deer remains demonstrate that the island could at times be part of a broader north-west European network of animal movement. The later local disappearance of some species, including giant deer and spotted hyaena, may have preceded the full glacial maximum, but exact causes remain unsettled.

The Human Question

Human history at this date is much less secure than environmental history. A reindeer femur from Castlepook Cave has been reported as dating to about 33,000 years ago and bearing a deep mark interpreted as a possible stone-tool cut made while the bone was fresh. If that interpretation is confirmed, it would indicate that people handled or butchered reindeer in Ireland during the later Upper Palaeolithic, far earlier than the long-established Mesolithic settlement record. It would not, however, prove a permanent population, a village, a named culture or occupation in the exact nominal year.

The distinction is essential. The femur came from an old cave collection, not from a newly excavated, intact living surface with hearths, stone tools and a tightly controlled sequence of dates. Natural damage, carnivore activity and the complex movement of cave deposits must always be considered when interpreting modified bone. The evidence is intriguing and historically important, but singular. Ireland presently lacks a securely excavated, contemporary settlement from around 33,000 years ago. The safest conclusion is that short visits by mobile hunter-gatherers are possible and perhaps indicated, whereas continuous habitation remains unproven.

Life Without Recorded Politics

Nothing supports claims about kingship, tribes, diplomacy, formal warfare or territorial states in Ireland at this point. There are no names, monuments, burials or settlements from which social ranks or political boundaries could responsibly be reconstructed. If people entered the island, they would have belonged to small, highly mobile Upper Palaeolithic hunting and gathering groups whose wider European counterparts depended on knowledge of animal movement, seasonal resources, shelter and routes. This is an analogy drawn from surrounding regions, not direct proof of an Irish camp or social system.

For the same reason, religion, language, art and learning cannot be described specifically for Ireland in 31,172 BCE. The absence of evidence is not evidence that people lacked beliefs, skills or traditions; it is a limit imposed by survival. Organic shelters, clothing, wooden implements and spoken knowledge are exceptionally unlikely to endure for more than thirty millennia, especially where later ice repeatedly scoured the ground. A sharp incision on bone, if human-made, shows practical action rather than a recoverable body of ritual or symbolism.

Economy, Movement and Risk

There was no agricultural economy, trade system or built settlement demonstrable in Ireland at this time. Farming lay many millennia in the future. Any human visitors would have obtained food from wild resources, with reindeer and other large mammals potentially important where available. But the Castlepook femur cannot tell us whether people killed the animal, scavenged it, removed a small portion of meat, or processed a carcass first taken by predators. Nor can it establish regular exchange with Britain or continental Europe. It does show why caves, river corridors and animal routes matter: they were points at which sparse traces could accumulate and, exceptionally, survive.

The major development was environmental, not political: Ireland was moving towards a period in which expanding ice would transform or obliterate much of its earlier landscape. The tundra wetland at Derryvree and the cave bones of Cork are survivors from before that transformation. They show an island periodically open to cold-adapted life, perhaps occasionally to human movement, but vulnerable to abrupt

climatic deterioration. Around 31,172 BCE, Ireland's history is best understood not as a chapter of recorded peoples and events, but as the fragile prelude to glaciation preserved in moss spores, freshwater silts and scattered animal bones.

Chapter 030 of 100

31171 BCE

Derryvree's Thirty-Thousand-Year Mud^[30]



“31,171 BCE” is a modern calendar label, not a year that can be recovered from the Irish archaeological record. No chronicle, ruler, settlement plan or securely dated human episode belongs to that particular twelve-month interval. Expressed in the archaeological convention of years before AD 1950, it lies roughly 33,120 years before present. At this depth of time, the responsible evidence consists of radiocarbon determinations with margins of error, calibrated ranges, sediment layers and fossil assemblages. The best Irish comparison is therefore not a supposed event in 31,171 BCE, but the later part of Marine Isotope Stage 3: an unstable interval of the last Ice Age before the fullest expansion of the British–Irish Ice Sheet.

For Ireland, this is chiefly an environmental history, with one important but unresolved human question. The island was not a political community, nor can archaeology identify tribes, leaders, diplomatic relationships, religious beliefs, languages or named places. There is no evidence for farming, livestock, permanent villages, trade networks, monuments or a continuous population. What can be described is a cold and changing landscape in which freshwater wetlands, sparse vegetation and large mammals survived locally, and in which a cave in north Cork preserves a disputed-looking but potentially momentous trace of human handling of an animal carcass.

A Date Within a Range

The closest securely relevant dated sequence is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks exposed a drumlin section containing organic-rich freshwater sediment between two tills: dense, unsorted deposits left by glacier ice. This simple arrangement is exceptionally valuable. It establishes that ice had covered the locality, that an interval of ice-free freshwater conditions followed,

and that later ice again laid down till over the wetland deposits. The organic bed produced the conventional radiocarbon result BIRM-166, $30,500 \pm 1,100$ radiocarbon years BP. Later calibration has placed the material broadly at about 36,900–31,700 calibrated years BP.

That wide range overlaps the modern label 31,171 BCE, but it emphatically does not date a day, season or event in that year. The sample was bulk organic material, rather than a precisely short-lived object such as a single seed, and both radiocarbon uncertainty and calibration matter greatly at this age. Derrynree is best understood as a time-window spanning millennia. Its strength lies in showing what existed in one Fermanagh locality during a cold phase, not in providing a calendar for all Ireland.

Wet Ground Between the Ice

Derrynree's sediment contained a remarkably varied fossil record. Pollen, plant macrofossils, mosses and insects indicate cold, open and largely treeless conditions, but not lifelessness. The site supported shallow freshwater, wet mossy ground and marsh margins. Sedges and aquatic plants are part of the picture; reported remains include bogbean and water-milfoil. Mountain-avens and other cold-adapted plants point towards tundra-like vegetation. Such evidence is often described as muskeg or wet tundra: waterlogged ground with pools, low vegetation and a short productive season, rather than forest or modern blanket bog.

This does not mean that every part of Ireland was identical. A wetland beneath what later became a drumlin cannot stand in for every coast, valley or upland. Nevertheless, it overturns the easy image of a universally sterile frozen island. At least in some ice-free areas, water remained available for much of the year, plants completed their life cycles, insects lived around the margins and organic material accumulated. Frost, snow, wind and seasonal thaw shaped that ecology. Summer growth may have briefly made particular hollows and lake edges attractive to grazing animals; winter conditions would have made the same places far harsher.

The broader geological setting was unsettled. Ireland was in the Midlandian cold stage, part of the wider glacial history of Britain and north-west Europe. Recent reconstructions indicate that the main late-stage expansion of the Irish Ice Sheet and the wider British–Irish Ice Sheet occurred after this broad period, with maximum ice extent reached much later, around the Last Glacial Maximum. Evidence from Derrynree and other pre-maximum deposits supports the conclusion that north-central Ireland retained ice-free ground until at least approximately 34,000 years ago, although ice conditions varied greatly by region and over time. The later advance buried, reworked and destroyed much of this older landscape.

Castlepook's Animal World

County Cork provides the other major line of evidence. Castlepook Cave, near Doneraile, is Ireland's richest known pre-Last Glacial Maximum vertebrate site. Excavations in the early twentieth century recovered more than 2,000 bones from its maze-like limestone passages. The assemblage includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, alongside wolf, Arctic fox and lemmings. Individual bones come from a very long span, and the cave was repeatedly used or entered by animals, water and sediment. It is therefore an archive, not a single momentary scene.

The fauna nevertheless reveals an Irish landscape capable of sustaining large herbivores and their predators during parts of the middle and late Ice Age. Reindeer imply open country with seasonal forage; mammoth and giant deer likewise belong to a world unlike later wooded Ireland. Spotted hyaena is especially striking. Its presence does not prove a hyaena den in every cave passage, but it helps explain

why bones accumulated and were modified, moved or scattered. Carnivore activity, natural death, flooding and antiquarian excavation have all complicated the deposits. A bone found in Castlepook cannot automatically be treated as evidence that the animal died where it was found, still less that people lived there.

These animals also show Ireland's changing physical connections with neighbouring lands. Lower global sea levels exposed extensive continental shelves, and animals reached the island during phases when routes across the Irish Sea region were viable. The precise geography of those routes remains difficult because changing sea level, local ice loading and ice margins altered coastlines and passages. The faunal record demonstrates movement into Ireland; it does not map a fixed land bridge, establish regular traffic or identify an organised trade route. There was no evidence of exchange in the economic sense: no imported tools, ornaments, stored goods or settlements are known from this approximate time.

The Reindeer Femur Question

One Castlepook object makes this era unusually important for Irish prehistory: a reindeer femur reported as bearing a mark consistent with cutting by a sharp stone tool. Radiocarbon dating of the bone has been publicised as about 33,000 years old, close to the period represented by 31,171 BCE. If the mark was made while the bone was fresh, and if the interpretation is sustained by further analysis, it would indicate that a person or people processed a reindeer carcass in Ireland far earlier than the island's previously accepted evidence for human activity.

That possibility must be separated from what the object cannot show. The radiocarbon determination dates the animal's death, not necessarily the incision. A solitary modified bone does not identify the maker's species, sex, age, language or cultural tradition. It does not prove a camp, family group, permanent settlement, hunting territory or a lasting colonisation. Nor has a diagnostic lithic tool assemblage been recovered in association with it. Castlepook's old excavations also removed much of the original context, while later disturbance has blurred the cave's stratigraphy. The proper conclusion is that the femur is evidence requiring continued specialist scrutiny, rather than a licence to populate the island with an imagined Ice-Age society.

This caution is strengthened by the wider history of Irish cave dating. Improved radiocarbon pretreatment has shown that several older dates on Irish Pleistocene animal bones were unreliable or substantially too young. Recent work at Alice and Gwendoline Cave in County Clare has demonstrated the value of re-dating museum collections and of revisiting early excavations with modern methods. It has also shown how much interpretation can depend upon the condition of a single bone and the precise circumstances of its recovery. The older the claim, the more important it is to distinguish observation from inference.

People, Society and Silence

Accordingly, political affairs, conflict and diplomacy cannot be reconstructed for Ireland around this date. There are no chiefs, territories, alliances or battles in the evidence. Nor can religion, art, learning or social organisation be responsibly described. The possible cut mark is compatible with a practical act of carcass processing, perhaps by highly mobile visitors following animal movements, but even that is an interpretation rather than a documented occupation. It is not evidence for reindeer domestication, ritual hunting or a settled Palaeolithic community.

Everyday life is better approached through constraints than inventions. Any humans present would have faced a severe seasonal environment with limited shelter, short-lived food opportunities and a landscape capable of changing rapidly as climate and ice margins shifted. Caves might offer temporary protection or preserve remains, but Castlepook's deposits do not prove that people occupied its chambers. The known animal assemblage suggests potential resources—meat, hides, bone, antler and fat—but there is no direct Irish evidence at this date for how any people used them.

An Island Becoming Harder to Reach

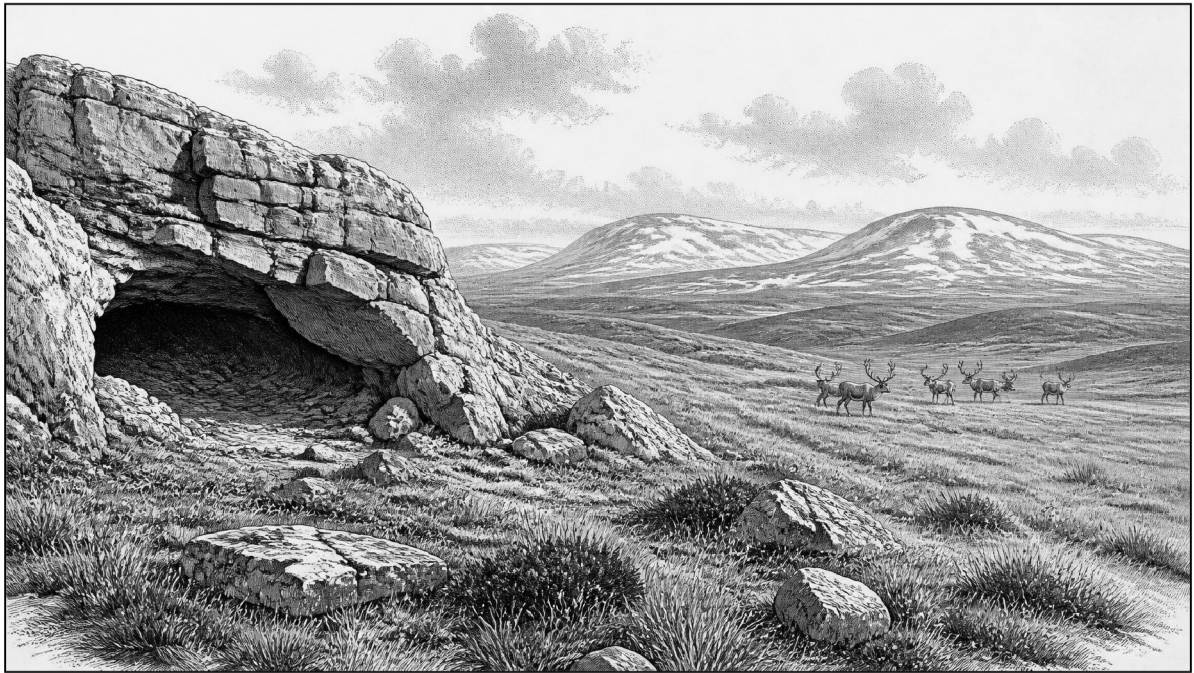
The leading historical development was environmental, not political: the approach of more extensive glaciation. As ice accumulated and expanded in later millennia, habitats were compressed, rerouted or overwhelmed. Large mammals disappeared from particular districts; freshwater beds such as Derryvree were sealed beneath new deposits; and former land surfaces were scoured or buried. This explains both why the surviving record is so fragmentary and why Derryvree and Castlepook matter disproportionately. One preserves a cold wetland between two glacial episodes; the other preserves a time-depth of animal remains from a changing Ice-Age fauna.

Ireland around the point labelled 31,171 BCE was therefore neither an empty white expanse nor a knowable human homeland. The firm record is of a severe but ecologically varied Ice-Age island: open ground, freshwater hollows, cold-adapted plants and mammals ranging from lemmings to mammoths. Derryvree provides the strongest local environmental testimony, while Castlepook preserves the tantalising question of human presence. The difference between those forms of evidence is the essential historical fact. Ireland's landscape and fauna can be described with confidence; its human story at this date remains possible, significant and unproven.

Chapter 031 of 100

31170 BCE

Ireland's Ice-Sheet Build-Up ^[31]



31,170 BCE is a useful modern label, not a date at which Ireland can be described with the precision of a chronicle. No written record, calendar, named ruler, settlement sequence or securely dated human camp allows historians to isolate a single year so deep in the Pleistocene. In calendar terms the label lies roughly 33,100 years before AD 1950, but archaeological and environmental evidence must be expressed in calibrated ranges, often extending across centuries or millennia. The responsible subject is therefore Ireland during the later part of Marine Isotope Stage 3: a cold, unstable phase of the last Ice Age, shortly before the main expansion of the British–Irish Ice Sheet.

A Date Without Annals

This was not a historical Ireland of kingdoms, borders or remembered ancestors. There is no evidence from around 33,100 calibrated years before present for political communities, diplomacy, warfare, formal religion, literacy, monuments or a settled population on the island. Nor can archaeology identify an Irish language, ethnicity or social group at this depth of time. Such absences matter. They are not gaps to be filled by imagination, but the defining condition of the evidence.

Even the chronological vocabulary needs care. Radiocarbon ages are measured in years before present, conventionally before AD 1950, and are not identical to calendar ages. They must be calibrated against changing levels of atmospheric carbon-14. IntCal20, the standard Northern Hemisphere calibration curve, reaches back to 55,000 calibrated years before present, but its use does not turn one ancient measurement into an exact calendar year. A date range also represents the age of a sampled bone, charcoal fragment or sediment horizon—not automatically the date of a human visit, an animal death elsewhere, or a whole landscape.

Before Full Glaciation

At this broad horizon Ireland stood near an important climatic threshold. Marine Isotope Stage 3, conventionally dated from about 57,000 to 29,000 years ago, contained abrupt swings between colder stadials and comparatively milder interstadials. Conditions could change dramatically on timescales far shorter than later prehistoric periods. The later Last Glacial Maximum was still ahead: the most extensive phase of the last British–Irish Ice Sheet is generally placed between roughly 29,000 and 20,000 years ago, though its margins advanced and retreated at different dates in different regions.

The best recent ice-sheet synthesis begins its reconstruction at 31,000 years before present because earlier constraints are sparse. It depicts ice building over parts of Ireland and Britain between 31,000 and 26,000 years ago, with expansion especially difficult to date in Ireland. By 30,000 years before present, its reconstruction infers major ice growth in northern and central Ireland and smaller ice caps in the south-west, including the Kerry–Cork region; by 28,000 years ago, Ireland was almost wholly ice-covered in the model. These are regional reconstructions, based on landforms, sediments, offshore cores and modelling, not observations made at 31,170 BCE itself. The precise extent of ice over any particular Irish valley at the requested date remains uncertain.

That uncertainty changes the safest picture of the island. Ireland should not be imagined simply as a frozen white block, nor as an unchanging open tundra. Its climate, snow cover, sea margins and available ground altered repeatedly. The land lay within a North Atlantic system in which growing ice, sea-level change, ocean circulation and shifting storm tracks all mattered. Later glaciation also eroded, buried and rearranged earlier surfaces. This helps explain why campsites and tracks, if they ever existed, are so elusive: an advancing ice sheet is an exceptionally efficient destroyer and recycler of landscape evidence.

Caves, Bones and a Lost Ecosystem

Southern Irish caves, above all Castlepook Cave near Doneraile in County Cork, offer the most vivid evidence for Ireland's wider Middle Palaeolithic and Upper Palaeolithic-age environment. Excavations undertaken in the early twentieth century recovered remains attributed to reindeer, mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Taken together, such finds establish that Ireland was at times part of a cold-adapted north-west European fauna. Reindeer and lemmings point towards open, severe conditions; mammoth and giant deer evoke extensive grazing country; hyaenas and wolves show that large predators and scavengers were also present.

But this impressive list must not be treated as a census for one year. Cave deposits form through many processes. Carnivores carry carcass parts into dens; animals die in fissures; water and sediment move bones; later excavation can mix or remove layers. The Castlepook assemblage was accumulated over a long period rather than during a single season, and the original investigations pre-dated modern excavation, sampling and recording standards. It can illuminate the kinds of animals that reached Ireland during portions of the late Pleistocene, but cannot prove that every listed species lived side by side at 31,170 BCE.

Recent re-dating makes the caution still sharper. Improved pre-treatment and radiocarbon measurement of bones from Castlepook, Foley Cave and Shandon Cave produced Castlepook ages between about 5,000 and 12,000 radiocarbon years older than previous results. The revised work suggests that some southern Irish Marine Isotope Stage 3 fauna, including giant deer and spotted hyaena, may have

disappeared locally before about 40,000 calibrated years before present—well before the later full glaciation. Thus Castlepook remains central to understanding Ice Age Ireland, but it cannot responsibly be used to proclaim a precisely dated ‘reindeer year’ in 31,170 BCE.

The Human Question

The same distinction between evidence and interpretation is essential for people. A reindeer femur from Castlepook has a deep linear mark interpreted by some investigators as damage made by a sharp stone tool while fresh bone was being processed. If that interpretation is confirmed, it would be extraordinarily important: it would indicate a very early, probably brief human presence in Ireland during the broader late Pleistocene. Yet no securely associated Palaeolithic stone-tool assemblage, hearth, dwelling, human skeleton or repeatedly occupied campsite has been found in Ireland for this period. The National Museum of Ireland therefore continues to state that clear evidence for human presence during the Irish Palaeolithic has not emerged.

The securely dated terminal-Pleistocene evidence is much later. At Alice and Gwendoline Cave in County Clare, a cut-marked brown-bear kneecap has yielded calibrated ranges of 12,810–12,590 and 12,810–12,685 years before present. That find has been presented as evidence of Late Upper Palaeolithic human activity, although debate continues over how confidently a single butchered bone can demonstrate occupation. Its importance here is methodological: it is a direct-dated object, with observable modification, but still does not licence a story of a permanent community. By comparison, a human presence in Ireland at about 33,100 calibrated years ago remains possible only in the broadest sense, not demonstrated.

Life, If People Reached the Island

If small groups did enter Ireland during a milder interval of this era, they would have been highly mobile hunter-gatherers, not farmers or village builders. Their subsistence would have depended upon seasonal knowledge, animal movement, weather and access to fuel, stone and shelter. Reindeer are often imagined as the obvious quarry, but there is no Irish kill-site or tool kit from this date to establish a particular hunting strategy. Likewise, no evidence identifies clothing, boats, kinship rules, ritual practice, music or visual art in Ireland. Comparisons with better-known Upper Palaeolithic societies in Britain and continental Europe can suggest possibilities, but they cannot substitute for Irish finds.

There is equally no basis for describing trade or diplomacy. Lower global sea levels changed the outlines of the north-west European shelf, but the route between Ireland, Britain and the continent, and the availability of usable crossings, varied with ice, water and terrain. No imported tool, raw-material trail or exchange network has been securely tied to this horizon in Ireland. Any visitors would have faced a landscape in which survival, rather than political organisation, is the only plausible historical question—yet even that is an inference from ecological context, not a recovered Irish camp.

What This Year Can Mean

The strongest history of 31,170 BCE is therefore environmental and evidential. Ireland was entering the build-up to major glaciation. Faunal caves in Cork preserve fragments of an older Ice Age world, while their re-dating demonstrates how rapidly accepted narratives can change when museum collections

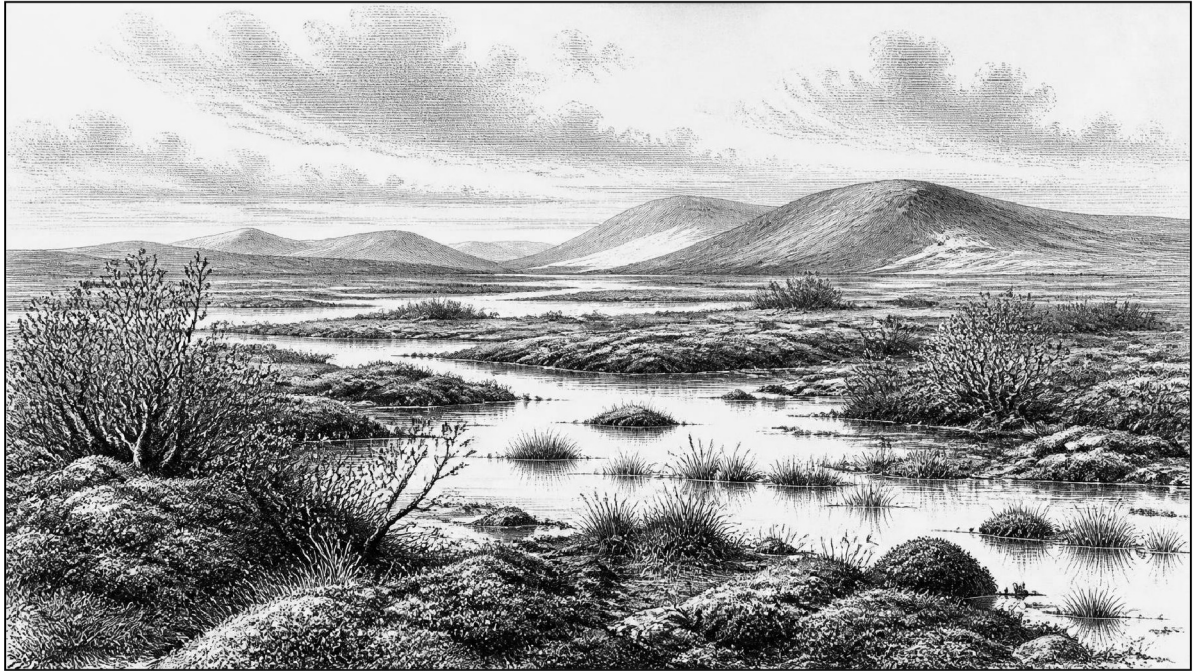
are re-examined. Glacial deposits, offshore landforms and ice-sheet models reveal a developing physical transformation on a vast scale, but leave local conditions imperfectly resolved.

Rather than a year of named events, this is a point within a long interval in which Ireland's future archaeological record was being both created and erased. Caves retained bones; ice later overran much of the country; and the absence of indisputable human sites remained as historically significant as the tantalising marks on a reindeer bone. For this date, humility is not a failure of history. It is the principal result of the evidence.

Chapter 032 of 100

31169 BCE

Derryvree's Two-Till Silence^[32]



“31,169 BCE” is a useful label for this series, not a date at which Irish archaeology can identify an event. It corresponds very roughly to 33,118 years before AD 1950, the conventional “present” used in radiocarbon reporting, but neither a settlement nor an animal bone can normally be assigned to that single calendar year. At this depth of time, the responsible approach is to use broad calibrated ranges, to distinguish a dated specimen from the activity inferred from it, and to accept that much of the island’s record was later erased or rearranged by ice.

Ireland lay in the Late Pleistocene, within Marine Isotope Stage 3, a long and unstable phase of the last glacial cycle. It was not yet the Last Glacial Maximum, when the British–Irish Ice Sheet later covered the island extensively. Around the notional year in question, the most important Irish story is neither a kingdom nor a migration recorded in tradition, but an environment changing between cold, locally ice-free landscapes and the growing power of glacier ice.

A Date Without a Chronicle

Modern calendar precision is unavailable. Radiocarbon dates measure the residual carbon-14 in once-living material and must be calibrated against independent records of past atmospheric change; they are expressed as probability ranges, not anniversary dates. At more than 30,000 years ago, the uncertainties are especially important. A label such as 31,169 BCE therefore cannot tell us what happened in Ireland in a particular season, decade or human lifetime.

The closest important environmental evidence is from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin, exposing freshwater silts and fine sands sealed between two tills: deposits left directly by separate phases of glacier ice. Organic material from the

intervening deposits produced a conventional radiocarbon age of $30,500 \pm 1,170$ radiocarbon years before present. Modern calibration has placed that determination broadly at about 36,900–31,700 calibrated years before present, or approximately 34,950–29,750 BCE.

The series date falls within that wide range. That does *not* mean a Derryvree pool existed precisely in 31,169 BCE, still less that its plants and animals all lived together then. It does mean that the site provides unusually direct evidence for an interval in which this part of Fermanagh was not overridden by glacier ice, before a later advance covered the deposits. The sedimentary sequence is the fact; the duration, exact climatic pulse and wider Irish geography remain interpretations constrained by it.

Freshwater Between the Ice

Derryvree was no woodland refuge resembling modern Ireland. Plant macrofossils, pollen and insect evidence point instead to a cold, open and wet periglacial environment: ground affected by repeated freezing and thawing, with freshwater pools or slow-moving water, mosses, sedges and low-growing tundra vegetation. Finds including bogbean (*Menyanthes trifoliata*), dwarf willow, mountain-avens and Arctic-alpine plants show that sheltered, waterlogged places could preserve life even in an austere wider landscape.

Such evidence should not be made more precise than it is. It supports a tundra-wetland mosaic at Derryvree, not a panoramic reconstruction of every Irish valley. Nevertheless, it matters because it disproves the simple notion that the whole island was continuously entombed beneath ice throughout the later Pleistocene. Other buried organic horizons at Greenagho, also in Fermanagh, and at sites in northern Ireland preserve evidence for changing, sometimes milder conditions during the glacial cycle. Crag Cave in County Kerry adds a different kind of record: episodes of stalagmite growth imply intervals when liquid water could percolate through shallow karst, tracking short-lived climatic ameliorations during the last glacial.

Regional change was sharp. Lowlands could contain wet hollows and open water while uplands carried local ice or lay close to expanding ice masses. By the later Last Glacial Maximum, many thousands of years after the Derryvree organic deposits formed, the British–Irish Ice Sheet was far more extensive. The drumlin itself records the consequence: a freshwater environment was eventually buried, compressed into the geological archive and concealed until twentieth-century road cutting revealed it.

Animals at the Western Edge

Southern Irish caves, above all Castlepook Cave near Doneraile in County Cork, provide the principal evidence for the island's larger Pleistocene animals. Cave collections include remains attributed to reindeer, woolly mammoth, brown bear, wolf, hare and spotted hyaena, alongside other species. The Irish Quaternary Fauna Project showed that mammals reached Ireland during the broad period between at least about 45,000 and 20,000 years ago. Reassessment using improved radiocarbon pretreatment has also demonstrated that several older dates from southern cave collections were too young, pushing parts of the fauna further back into Marine Isotope Stage 3.

These bones establish real animal presence, but they are not a census from one moment. Many were excavated in the late nineteenth and early twentieth centuries, when deposits had often already been disturbed by animals, water and earlier digging. Carnivores may have dragged prey into caves; bones can

be redeposited; and individual specimens may differ greatly in age. It would be unsafe to picture a single herd of reindeer, a mammoth and a hyaena sharing one Irish hillside in 31,169 BCE simply because all occur in broadly comparable cave assemblages.

Still, the faunal record has large implications. Reindeer and Arctic lemmings fit the evidence for open, cold ground. Mammoth and hyaena demonstrate that, at some points before the maximum ice advance, routes existed by which large mammals could enter or re-enter Ireland. Sea level was much lower than today, and the geography of the Irish Sea basin differed profoundly, although the exact land, coast and crossing conditions changed repeatedly. Ireland was an extreme north-western margin of European animal dispersal, not an isolated modern island.

The Human Question

There is no securely excavated dwelling, hearth, stone-tool assemblage, grave or continuous settlement in Ireland that can be assigned to this date. Consequently, no political affairs, diplomacy, warfare, ruler, tribe, language, religion, school or trade network can responsibly be described for the island in 31,169 BCE. Terms such as Gaelic, Celtic and Irish belong to immensely later historical contexts and should not be projected backwards onto an Ice Age landscape.

There is, however, one provocative object. A reindeer femur from Castlepook, held in the National Museum of Ireland's natural-history collections, has been reported as bearing a deep mark interpreted by zooarchaeologist Ruth Carden as a fresh-bone incision or chopping trace made with a sharp stone implement. County Cork heritage material identifies the specimen as Palaeolithic and gives it an approximate date of 31,000 BCE. If the mark is confirmed as human butchery, it would indicate that people reached Ireland during a broadly comparable pre-maximum phase.

That conclusion remains necessarily narrow. The femur comes from an old cave collection rather than a modern, intact occupation layer containing associated tools, charcoal, food debris and repeated living surfaces. Dating the animal's death does not automatically date the mark, identify its maker, show where the animal was killed, or demonstrate that the cave itself was occupied by people. It may record one brief episode of carcass processing; it cannot establish a resident population. The 2022 Castlepook Cave excavation was designed in part to seek stratified evidence—lithics, charcoal, modified bone or cave art—and demonstrates how much remains to be tested.

Society Beyond Recovery

If people did visit Ireland in this broad period, they would have arrived in a landscape in which mobility, weather, animal movements and access to shelter mattered more than fixed fields or permanent villages. European Upper Palaeolithic comparisons suggest that a single reindeer could provide meat, marrow, hide, sinew, antler and bone. But comparison is not evidence that any particular resource was taken at Castlepook, nor that people hunted the animal rather than scavenged it, nor that they belonged to a named archaeological culture.

For the same reason, religious and cultural life cannot be recovered from the Irish evidence. People elsewhere in Ice Age Europe created tools, ornaments, images and formal burial places, but no equivalent material securely attributable to 31,169 BCE has been found in Ireland. Absence of such finds does not prove an absence of belief, speech, kinship or learning. It establishes the more modest point that none can presently be described for this island.

Economy and trade are likewise beyond direct observation. There are no identified Irish exchanges, imported objects or extraction sites of this age. The demonstrable movements are ecological: plants occupying wet ground, animals dispersing through changing northern landscapes, and eventually glacier ice advancing across regions that had supported freshwater habitats. The most secure history of Ireland at this date is therefore environmental, with a possible but unproven human edge.

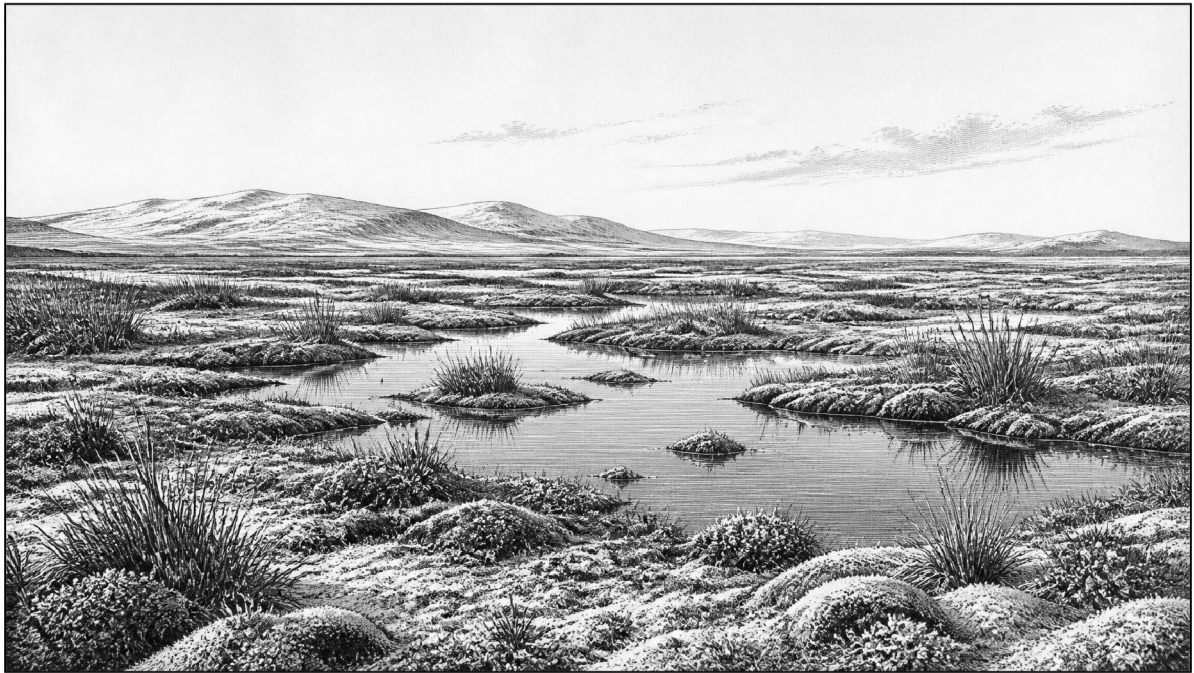
An Archive of Intervals

Derryvree's importance lies in its silence as much as in its fossils. The two tills announce glacial phases; the organic silts preserve an interval between them. Together with cave bones, speleothems and modern dating methods, they show a country repeatedly transformed by climate before the later ice sheet obscured much of the evidence. Around 31,169 BCE, Ireland was neither a timeless wilderness nor a known human homeland. It was a changing cold-margin landscape whose wet hollows, caves and buried sediments offer rare, carefully qualified glimpses of deep time.

Chapter 033 of 100

31168 BCE

Fermanagh's Last Open Wetland^[33]



The label 31,168 BCE cannot identify an Irish event, ruler, battle or community in the way a later historical year can. It is a modern conversion, roughly 33,100 calendar years before the 1950 baseline used by radiocarbon specialists. At this depth of time, modern calendar-year precision is unavailable. The responsible subject is a broad Late Pleistocene interval, within Marine Isotope Stage 3 (MIS 3), reconstructed from sediments, pollen, plant and insect remains, animal bones, caves and the landforms made by ice.

The closest unusually informative Irish record comes from Derryvree townland, near Maguiresbridge in present-day County Fermanagh. It does not date a single year. Organic freshwater silts and fine sands there produced the radiocarbon determination BIRM-166, conventionally reported as 30,500 radiocarbon years before present, with a substantial uncertainty. Published calibration places it broadly between about 36,900 and 31,700 calibrated years before present: approximately 34,950–29,750 BCE. The requested year falls inside that broad range, but not at a point science can isolate. Derryvree therefore illuminates conditions around this era, rather than proving that a particular pool, animal or human action occurred in 31,168 BCE.

A Wetland Between Two Glaciers

The value of Derryvree lies first in its physical sequence. Roadworks in 1969 cut through a drumlin and revealed freshwater deposits enclosed between two thick tills, the unsorted debris laid down directly by glacier ice. The order of layers is decisive evidence. Ice had earlier crossed the locality; ice-free or at least locally glacier-free conditions then allowed water, silt, sand and organic material to accumulate; later

ice buried the wetland beneath a fresh sheet of till. This is not a picturesque hypothesis but an observed stratigraphy. It also explains why the site matters: a short-lived and fragile environmental archive was sealed beneath the landscape created by a later glacial advance.

The Derryvree flora and fauna indicate a cold, periglacial setting with open tundra vegetation. Moss macrofossils, herb pollen, sedges and wetland plants point to waterlogged ground and shallow fresh water amid largely treeless country. The original investigators found botanical evidence of exceptional importance because it offered a direct glimpse of Irish Ice Age vegetation, rather than relying only on broad analogy with Britain or continental Europe. The landscape was not a continuous white desert. In favourable hollows, meltwater and groundwater could sustain pools, marshy margins and moss-rich ground during a brief growing season, while exposed terrain beyond them was sparse, windy and subject to frost.

That reconstruction must remain local. Derryvree shows what existed near Maguiresbridge during part of an interval; it cannot furnish a weather report for the entire island, let alone a map for a single year. Still, it fits wider evidence that much of Ireland was not yet covered by the fully developed last Irish Ice Sheet at the beginning of its major expansion. Other Fermanagh deposits, including organic material at Greenagho, and evidence from the western seaboard indicate ice-free phases before the ice sheet grew dramatically. Later, the Last Glacial Maximum transformed the situation: ice extended across almost all low ground, and in several sectors reached far offshore. The Ireland of the early thirties of millennia BCE was thus a landscape in transition towards much more extensive glaciation, not simply ‘before the Ice Age’.

Animals and Their Limits

Animal remains provide a second, unevenly distributed line of evidence. Castlepook Cave, near Doneraile in County Cork, is Ireland’s richest known repository of vertebrate remains from the period leading towards the Last Glacial Maximum. Its deposits have produced bones attributed to woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, while later Ice Age layers contain lemmings, Arctic fox and wolf. These species demonstrate that, during parts of the Middle and Late Pleistocene, Ireland could sustain or receive animals adapted to open, cold environments as well as larger herbivores and their predators.

Yet Castlepook is a cave repository accumulated over many millennia, not a census of animals alive together in one valley. Bones were introduced by carnivores, water, natural deaths and earlier excavations; parts of the deposit were disturbed. Individual radiocarbon dates span a very long period. It is therefore sound to say that reindeer, mammoth, giant deer and hyaena belong to the wider Irish Ice Age faunal record, but unsound to assemble them into a single, precise herd scene for 31,168 BCE. The same caution applies to routes of animal movement. Lower global sea levels altered coastlines and exposed areas now underwater, but present evidence cannot reconstruct one certain crossing route into Ireland at this date.

The ecological implications are nevertheless substantial. Reindeer favour open ground and could exploit lichens, herbs and grasses; large herbivores required extensive feeding ranges; predators and scavengers followed different opportunities. The Derryvree wetland, meanwhile, was a small but productive refuge for plants, insects and freshwater life. Such mosaics mattered in a cold world. They supplied forage, water and shelter at a local scale, while the severe seasonality inferred from the plants and periglacial setting imposed hard limits on population sizes and permanence. Ireland was not an agricultural landscape, nor one divided into fields, estates or tribal territories visible to us.

The Human Question

There are no securely excavated settlements, hearths, burials, stone-tool assemblages or written traces that permit a history of an Irish population at this time. Accordingly, there is no evidential basis for political affairs, diplomacy, warfare, formal religion, teaching institutions, trade networks or named cultural groups in 31,168 BCE. These absences are not minor gaps in an otherwise familiar story: they define the story. No state, kingdom, language community or ancestral people can responsibly be projected backwards from later Irish history into this period.

One claim deserves careful notice because it lies close to the requested date. A reindeer femur from Castlepook has been publicly reported as bearing an incision interpreted as a sharp stone-tool cutmark, with the bone described as about 33,000 years old. If the surface mark is confirmed as human-made and contemporary with the animal's death, it may represent an exceptionally early sign of carcass processing in Ireland. It would suggest a brief visit by hunter-gatherers, not a settled society. A cut on one bone cannot show whether people hunted the animal, scavenged it, travelled regularly to the island, exchanged goods, made a camp nearby or left descendants.

The qualification is essential. The cave's old and disturbed collections lack the securely associated hearth, tools and occupation surface that would turn an isolated modified bone into a well-contextualised site. National cultural guidance has long stated that clear evidence for human presence in Ireland during the Palaeolithic has not emerged, while recent archaeological discussions treat possible Upper Palaeolithic evidence as intriguing but limited. The prudent conclusion is therefore twofold: humans may have reached Ireland during the wider period, but sustained occupation at 31,168 BCE is unproven. The far better-attested Mesolithic settlement belongs tens of millennia later, after the final great ice retreat.

Society Without a Chronicle

If people did visit, their everyday economy would have depended on immediate access to animal, plant and mineral resources: meat, fat, marrow, hides, sinew, bone, fuel and perhaps workable stone. That is an inference from hunter-gatherer lifeways and the available fauna, not direct evidence of a particular Irish camp. There is no basis for estimating population, household form, gender roles, ritual practice, art, language or learning. Nor should the sophisticated Upper Palaeolithic cultures known elsewhere in Europe be treated as automatically present in Ireland. Similar age is not proof of contact, migration or shared custom.

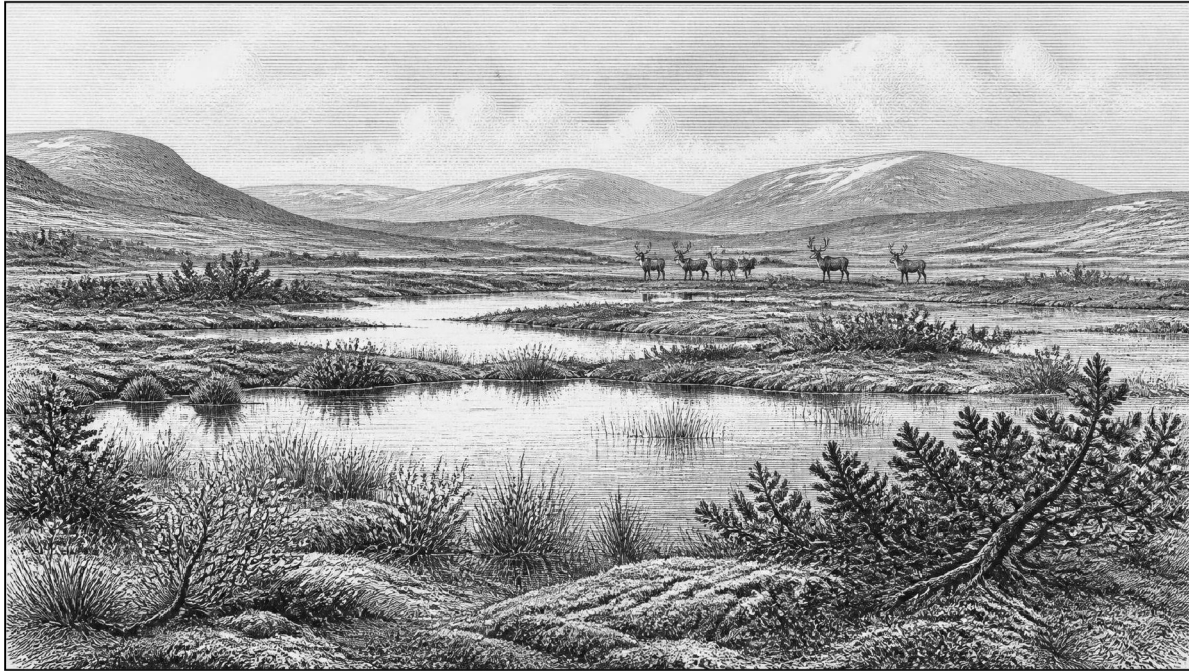
What can be said is that environmental change was the dominant historical force. Across the wider British–Irish Ice Sheet system, ice expanded asynchronously between roughly 30,000 and 22,000 years ago, before reaching a maximum volume around 23,000 years ago. Derryvree's wetland belongs to the earlier, unstable part of that long transformation. Subsequent glacial advance erased, reworked or entombed many older surfaces and any fragile traces people might have left. This helps explain why the archaeological record is so scant, though it cannot turn missing evidence into proof of people.

For Ireland around this notional year, then, the central development was neither a human deed nor a political change. It was an interval of cold, open, locally wet country between glacial episodes: a Fermanagh freshwater habitat later sealed beneath ice, set within an island-scale shift towards the Last Glacial Maximum. Its legacy is a handful of silts, seeds, mosses, pollen grains, insects, bones and landforms. They provide a real history, but one whose authority depends on resisting the tempting invention of an exact annual past.

Chapter 034 of 100

31167 BCE

Derryvree's Calendarless Wetland^[34]



31,167 BCE is a modern chronological label, not a year that anybody in Ireland could have named, recorded or experienced as a date. At this depth in time, calendar-year precision is unavailable. Counted back from the conventional archaeological reference point of AD 1950, it lies roughly 33,100 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. The responsible question is therefore not what happened in Ireland during one particular year, but what the surviving evidence can say about the island across the surrounding millennia.

The closest informative Irish record is a buried freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh. Its organic silts were preserved between two layers of glacial till in a road-cut through a drumlin. A conventional radiocarbon determination of $30,500 \pm 1,100$ radiocarbon years BP was obtained from the deposits. When calibrated, published estimates place the episode broadly around 31,700–36,900 calendar years BP. That wide range encompasses the notional date of 31,167 BCE, but does not identify it exactly. The deposit is evidence for an interval of ice-free ground and wetland conditions; it is not an annual diary.

A Wetland Between Ice Advances

Derryvree is important because its position in the sequence is unambiguous even where its exact age is not. Older till lay below the organic sediments and younger till above them. At some point between separate phases of glacier activity, a low hollow held fresh water, accumulating silt, plant fragments and the remains of small creatures. Later ice overrode or buried the site, sealing a fragile ecological record beneath the material that would help form the drumlin landscape of Fermanagh. This is a rare survival: much of Ireland's earlier ground surface was eroded or reworked by the expanding ice sheet that followed.

Pollen, seeds and other plant macrofossils from the Derryvree beds indicate an open, treeless landscape rather than forest. Grasses and sedges were prominent, alongside herbs and low-growing shrubs. Finds including dwarf willow, juniper, mountain-avens, bogbean and aquatic water-milfoil point to a varied tundra or muskeg environment: wet ground, mossy margins, shallow pools and patches of better-drained vegetation. Such a setting would have changed seasonally, with a short growing period, cold winters and local waterlogged ground. It was not a featureless white desert, but neither was it a mild, wooded Ireland.

Fossil insects strengthen that picture. Beetle evidence has been read as indicating plant-rich wet ground and open pools bordered by mosses. These tiny remains matter because they are locally derived and often sensitive to habitat. They support the interpretation of a cold, exposed wetland mosaic, rather than allowing a reconstruction based on pollen alone. Yet even this evidence has limits. A sediment layer represents accumulated material, possibly over centuries or longer; it cannot tell us whether a particular summer near 31,167 BCE was wet, whether a pond froze early, or where every plant grew.

Climate in Motion

Ireland at this time belonged to the Atlantic fringe of north-west Europe, where climate could shift sharply on millennial and shorter scales. The Greenland ice cores record repeated alternations between colder stadials and comparatively milder Greenland Interstadials during MIS 3. Irish evidence cannot be matched confidently to a particular ice-core year, but it does show that the island responded to such instability. The Derryvree wetland records a phase sufficiently ameliorated for standing fresh water and vegetation. It does not demonstrate a warm climate by modern standards.

Crag Cave in County Kerry offers complementary evidence. Uranium-thorium dating of calcite formations shows that speleothems in this shallow limestone cave grew episodically during MIS 3. Their formation required infiltrating liquid water and conditions in which the local mean annual temperature was plausibly above freezing. Periods when growth ceased signal harsher conditions, though cave hydrology also matters. Together, Derryvree and Crag Cave show an Ireland that alternated between habitable cold landscapes and more severe phases, well before the island became wholly engulfed during the Last Glacial Maximum.

The later maximum of the British–Irish Ice Sheet should not be projected backwards without qualification. Research places its broad maximum considerably later, around 27,000–23,000 years ago in the Irish sector, with ice reaching the continental shelf around much of the island. Around the Derryvree interval, ice margins and ice-free terrain probably varied regionally and through time. The older and younger tills at Derryvree demonstrate glacial activity on either side of its wetland phase, but they do not provide a map of Ireland for 31,167 BCE. The correct image is one of change, not a single fixed ice boundary.

Animals and the Cave Record

Caves in southern Ireland preserve a second, very different archive. Castlepook Cave near Doneraile, County Cork, has yielded remains of woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. This is striking evidence that parts of Ireland supported, at different times within MIS 3, a cold-climate mammal community with large herbivores, predators and scavengers.

Reindeer and mammoth evoke open country; lemmings and Arctic fox underline the northern character of the fauna. The cave itself may have served as a den, shelter or trap, rather than a cross-section of the living countryside.

The dates and associations require care. Much Castlepook material was collected during early excavations, before modern recording standards, and later work has shown that some older radiocarbon results needed reconsideration. Improved pretreatment and redating place parts of the assemblage earlier within MIS 3 than once thought. Individual bones may differ markedly in age, and an animal found in a cave need not have died nearby or during the same season as another. The assemblage therefore illuminates the kinds of animals able to reach and use Ireland in this broad phase, not a guaranteed animal census for 31,167 BCE.

Predators shaped this animal world. Spotted hyaenas could accumulate bones through hunting, scavenging and denning, while bears, wolves and natural processes also altered carcasses. Tooth marks, breakage and the cave setting complicate any simple story of prey and predator. The wider inference is nevertheless secure: Ireland was not biologically empty throughout MIS 3. At intervals, substantial mammals crossed or occupied its changing landscapes. Lower sea levels altered coastlines and exposed large areas of continental shelf, although the precise routes and periods of access remain matters for geological reconstruction rather than assumptions about an uninterrupted land bridge.

No Recoverable Human Society

There is no securely dated settlement, hearth, stone-tool assemblage, human burial or built structure from Ireland that can be assigned to this period. Consequently, political affairs, diplomacy, warfare, law, languages, named communities and institutions cannot responsibly be described. There is likewise no basis for reconstructing an Irish religion, art tradition, teaching system, domestic routine or exchange network in 31,167 BCE. Absence of evidence is not proof that no person ever reached the island during the wider Upper Palaeolithic; it is a statement about what the surviving Irish record currently demonstrates.

The earliest published direct evidence interpreted as human activity in Ireland is vastly later: cut marks on a brown-bear patella from Alice and Gwendoline Cave, County Clare, radiocarbon dated to roughly 12,800–12,600 calendar years BP. That important Late Upper Palaeolithic find concerns a different landscape after the Last Glacial Maximum and cannot be used to populate MIS 3 Ireland retrospectively. Claims based on apparently marked animal bones from much older deposits demand especially stringent tests, including secure dating, microscopic analysis and archaeological context. A cut or scrape alone cannot establish a settlement.

For that reason, there can be no human economy to describe at this date. The wetland's primary productivity supported insects and perhaps grazing animals; carnivores and scavengers participated in food webs visible through bone accumulations. But hunting, trade, seasonal camps, clothing, boats and social relations belong to hypothetical visitors unless direct evidence appears. The archaeology is stronger when it reconstructs ecosystems than when it invents people to inhabit them.

An Island Before History

The most meaningful development around 31,167 BCE was environmental, not political. Ireland lay in a fluctuating Late Pleistocene world where ice advanced and retreated regionally, freshwater wetlands briefly developed, caves received animal remains and open vegetation colonised cold ground. Derryvree

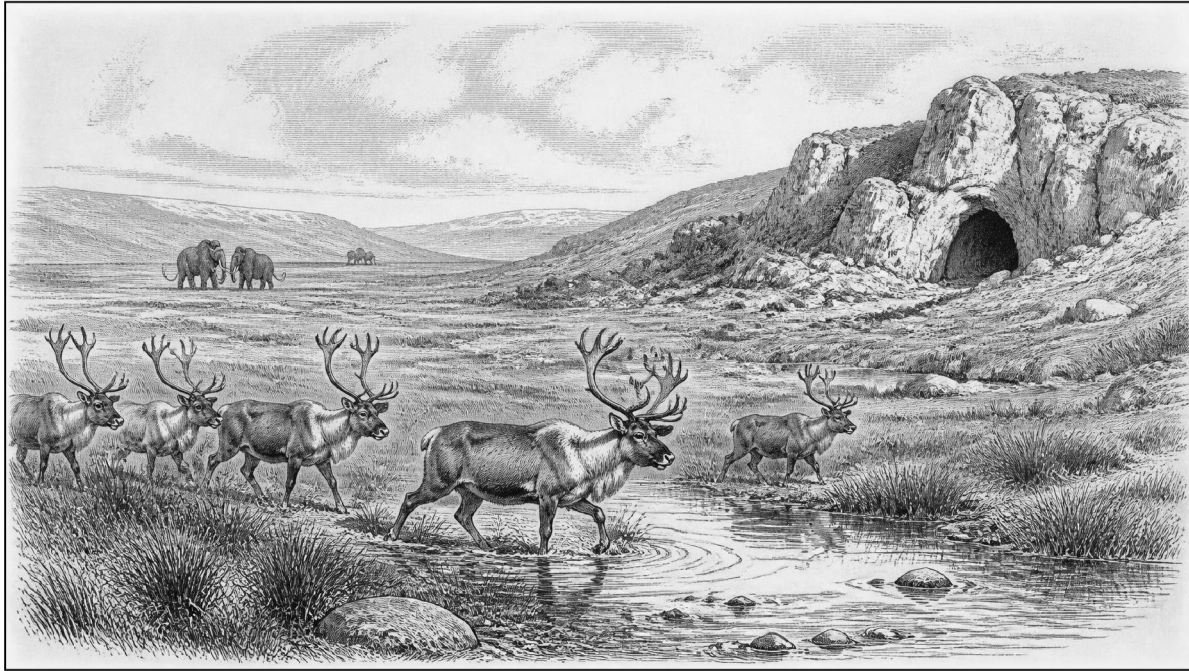
preserves the clearest local testimony: a living wetland existed between glacial episodes in Fermanagh across a calibrated range that includes this notional year. Castlepook and Crag Cave broaden the scene into one of mobile fauna and episodic climatic improvement.

This is not yet Ireland as a society, kingdom or nation. It is Ireland as terrain, water, plants, animals and shifting ice: a landscape repeatedly made available, transformed and partly erased by climatic change. Its sparse evidence deserves precision precisely because it is so old. Around 31,167 BCE, the island's recoverable past is a palaeoecological record, and its most eloquent witnesses are buried silts, pollen grains, beetle fragments, calcite and bone.

Chapter 035 of 100

31166 BCE

Castlepook's Possible Butchery ^[35]



31,166 BCE is not a date at which Irish history can be narrated year by year. It is a modern calendar label applied to a time roughly 33,100 years before AD 1950, during the Late Pleistocene. No written record, settlement sequence or archaeological layer in Ireland can identify events in this particular year. Even scientific dates from this depth of time carry substantial ranges and depend on calibration. The responsible task is therefore to place the notional year within the changing landscapes of Marine Isotope Stage 3, before the Last Glacial Maximum, and to distinguish firmly between what the evidence demonstrates and what it merely allows archaeologists to consider.

A Date Within a Long Cold Age

By this point, north-west Europe was well inside the last glacial cycle, but Ireland was not simply a single, permanently frozen island beneath an unbroken ice sheet. Ice sheets grew and contracted; temperatures, rainfall, sea ice and vegetation altered repeatedly on scales far longer than a human lifetime but shorter than an archaeological period. Greenland ice cores show that the North Atlantic climate was prone to abrupt millennial and shorter shifts. Ireland lay at the western edge of that unstable Atlantic world, and its environmental history must be understood as a sequence of changing conditions rather than a fixed “Ice Age” scene.

The precise extent of ice over Ireland around this notional date remains uncertain. The latest British-Irish Ice Sheet reconstruction begins at 31,000 years ago because older constraints are sparse, and it presents alternative minimum, optimum and maximum ice limits rather than a single uncontested map. Its preferred reconstruction envisages ice accumulation in Northern Ireland while substantial areas of Ireland, especially in the south and east, may have remained outside extensive ice cover. That is a model-based reconstruction, not a photograph of the island on one particular day.

Local stratigraphy independently confirms that at least parts of Ireland experienced ice-free intervals before the ice sheet reached its later maximum. At Derryvree near Maguiresbridge, County Fermanagh, organic-rich freshwater silts lie between two tills: deposits left by glaciers. A conventional radiocarbon age of about 30,500 radiocarbon years BP has been calibrated broadly to c. 36,900–31,700 calibrated years BP. The sequence proves that a wet, non-glacial environment existed locally between glacier advances. It does not prove that every Irish region was open at once, nor can it pin that environment to 31,166 BCE with calendar-year confidence.

Wetlands Beneath Later Ice

Derryvree is valuable because it preserves fragile evidence that later ice might easily have erased. Plant and invertebrate remains from such inter-till sediments indicate cold, open environments with wet ground, pools and sedge-rich or moss-rich vegetation rather than closed woodland. Species recorded from comparable Fermanagh deposits, including dwarf willow, mountain-avens, bogbean and aquatic plants, show that even a severe glacial landscape could contain sheltered freshwater habitats and short productive seasons. These were not modern bogs or forests transplanted into the past: they were elements of a periglacial mosaic shaped by frost, thin soils, exposed ground and seasonal water.

Such evidence also cautions against treating the whole island as environmentally uniform. Upland ground, limestone districts, river valleys, lake basins and coastal lowlands would have responded differently to climatic shifts and advancing ice. The southern Irish record contains cave deposits and speleothems, while northern and central records include buried lake and wetland sediments. Recent work on British and Irish speleothems likewise shows that cave calcite growth, which requires water moving through unfrozen ground, can complicate simple reconstructions of total ice cover. Ireland around this time was a changing patchwork of ice, cold-open terrain, flowing water and protected subterranean spaces.

Castlepook's Faunal Landscape

The most evocative Irish evidence close to this broad period comes from Castlepook Cave, near Doneraile in north County Cork. Excavations undertaken chiefly in the early twentieth century recovered a remarkable assemblage of Pleistocene animal remains. The cave is Ireland's richest known site for vertebrate evidence from the period leading towards the Last Glacial Maximum. Its recorded fauna includes woolly mammoth, reindeer, giant deer, brown bear and spotted hyena, as well as smaller cold-adapted animals in later deposits.

These animals should not be imagined as members of one neatly contemporaneous herd. A cave bone collection may have accumulated over thousands of years. Water movement, natural death, carnivore activity, excavation methods and later disturbance can mix remains from different episodes. Spotted hyena is especially important to interpretation: hyenas could transport bones into a den or feeding place, gnaw carcasses and create concentrations that can superficially resemble human refuse. Castlepook is therefore direct evidence for a rich cold-stage animal world in Ireland, but it is not a single undisturbed camp floor.

Nevertheless, the fauna gives a reasonable picture of the kinds of country available in parts of southern Ireland during suitable phases. Reindeer and mammoth point towards broad, open grassland-tundra or steppe-tundra habitats, rather than dense forest. Large herbivores would have moved through

seasonal landscapes in search of forage; wolves, bears and hyenas occupied overlapping ecological niches. The presence of water, caves and varied limestone terrain could have created local refuges. This was a land with living animal communities, not a sterile margin waiting passively for the ice sheet.

The Reindeer Bone Question

A reindeer femur from Castlepook has made this era especially significant. Reassessment of museum collections identified a deep mark on the bone that has been interpreted as a possible chop or cut made by a sharp stone implement while the bone was fresh. The animal bone has been presented as dating to approximately 33,000 years ago, placing it broadly near the chronological horizon represented by 31,166 BCE. If the mark was made by people at the time of carcass processing, it would be potentially the earliest evidence of human handling of an animal in Ireland.

That conditional language matters. A dated bone establishes the age of the animal, not automatically the date, agent or circumstances of every mark upon it. Nor does one modified limb bone establish a settlement, a hunting camp, a resident population or a named cultural group. The bone may have entered the cave through complex processes after any human action. Current excavations seek intact Pleistocene deposits, lithics, charcoal, further modified bone and secure stratigraphic context precisely because these are the materials needed to test the claim properly.

The cautious conclusion is still an important one. Ireland may have been visited intermittently by Upper Palaeolithic people during an earlier, ice-free phase of the last glacial cycle. At the very least, Castlepook demonstrates that its southern landscape supported prey animals and that a possible human signature deserves sustained investigation. It does not yet demonstrate enduring occupation. The securely dated butchered brown-bear patella from Alice and Gwendoline Cave, County Clare, is vastly later, dating to c. 12,810–12,590 calibrated years BP; it remains the published benchmark for a securely dated Upper Palaeolithic human presence in Ireland.

No Recoverable Polity

For political affairs, diplomacy and conflict, the evidence is silence. There were no states, kingdoms, borders, written laws or institutions in Ireland that archaeology can recover for this point in time. Nor is there evidence for an Irish population from which social ranks, kin groups, languages or leaders can responsibly be inferred. A passing hunting party, if one was present, would not constitute a polity. The island's later political map has no relevance here.

The same restraint applies to everyday life, economy, trade, religion, culture and learning. Continental Upper Palaeolithic communities made sophisticated stone tools, used animal resources intensively and in some regions created portable and cave art. Those facts make a short human visit to Ireland conceivable, particularly when lower sea levels altered the geography of the Irish Sea region. They do not demonstrate that people at Castlepook possessed any particular toolkit, ritual, artwork, exchange network or belief system. No Irish dwelling, hearth, human burial, securely associated stone tool or artwork of this age is presently available to support such claims.

Approaching Maximum Glaciation

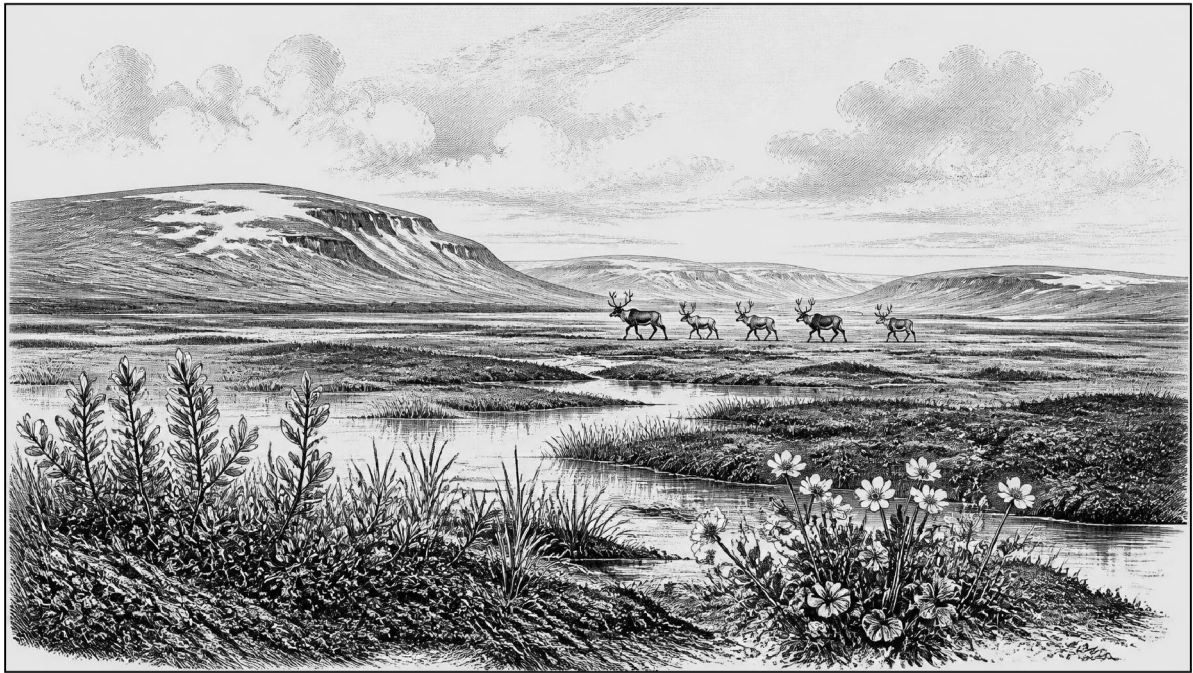
The great development illuminated by 31,166 BCE is therefore environmental rather than political: Ireland stood within a volatile pre-maximum glacial interval. In some areas, freshwater wetlands accumulated organic sediment; in others, cold-adapted mammals ranged over open country; in Cork, limestone caves trapped evidence later excavated and preserved in national collections. Yet the climatic trajectory was towards much more extensive glaciation. The British–Irish Ice Sheet later expanded across most of Ireland and the adjoining shelf, remodelling landscapes and destroying or burying much older evidence.

What survives is consequently exceptional and fragmentary. A silt layer under a drumlin, a cave bone, a hyena skull and a contested mark on reindeer bone are not small details in an otherwise complete story; they are much of the story. Around 31,166 BCE, Ireland cannot be assigned a historical event. It can, however, be recognised as a place of ice-free local habitats, severe climatic change and Pleistocene animal life, with a tantalising but unconfirmed prospect that humans briefly shared that world.

Chapter 036 of 100

31165 BCE

Castlepook's Earliest Claim ^[36]



To place 31,165 BCE on an Irish timeline is useful only as a modern filing device. No Irish person, animal bone, wetland layer or ice margin can be dated to that individual calendar year. In simple calendar arithmetic it falls about 33,114 years before AD 1950, the conventional reference point for “before present” dating, but the evidence available for this remote period is expressed in broad radiocarbon and calibrated ranges. The responsible history of Ireland at this horizon is therefore not a chronicle of named events. It is a reconstruction of a cold, changing Pleistocene landscape, drawn from sediments, fossils, cave deposits and the contentious possibility that people briefly entered it.

Modern Ireland did not exist as a country, society or island with fixed shores. “Ireland” here means the landmass and surrounding shelf that would later form the island. Its Late Pleistocene history belongs to Marine Isotope Stage 3, a long and climatically unstable part of the last glacial cycle. Temperatures, sea levels and ice margins altered over centuries and millennia; an apparently precise BCE label must not conceal that uncertainty.

A Date Inside a Wide Window

The strongest environmental evidence near this chronological horizon comes from Derryvree near Maguiresbridge, County Fermanagh. Roadworks in 1969 exposed freshwater silts and fine sands trapped between two thick tills within a drumlin. Eric Colhoun, James Dickson, A. M. McCabe and F. W. Shotton identified plant and animal remains which indicated open tundra vegetation and a periglacial climate. The deposit is exceptionally valuable because it proves that this part of Ireland was ice-free long enough for a cold wetland ecosystem to form between glacial advances.

A conventional radiocarbon determination on the organic material, BIRM-166, was reported as 30,500 $\pm$ 1,100 radiocarbon years BP. Calibrated expressions of its possible age span a very wide interval, commonly given as roughly 36,900–31,700 calendar years BP. Thus 31,165 BCE lies within the broad chronological neighbourhood of the Derryvree deposits, rather than at a securely identifiable level within them. The date was obtained from total organic carbon in a legacy sample, and recent ice-sheet studies sensibly treat it with caution when modelling the exact timing of glacier movement. It remains compelling evidence for pre-Last Glacial Maximum ice-free ground, but it is not a calendar.

The wider ice-sheet picture is similarly provisional. Modern reconstructions of the British–Irish Ice Sheet begin around 31,000 years ago because earlier constraints are sparse. They suggest that ice was building on high ground in parts of Ireland and Britain, while the final maximum extent was still to come several thousand years later. This means that Ireland around the present horizon should not be imagined either as wholly sealed beneath ice or as a uniformly open plain. Conditions differed sharply by region, elevation and time. Fermanagh’s buried wetland and the southern cave fauna instead reveal short-lived or regional ecological opportunities within a severe glacial world.

Wetlands, Tundra and Cave Fauna

Derryvree gives the clearest picture of vegetation. Its organic silts preserved remains of mosses, sedges, dwarf willow, mountain-avens, Arctic clubmoss and aquatic plants including bogbean and water-milfoil. Such a list does not describe a forested Ireland. It points to low, open ground with shallow pools, sedge-rich margins and patches of tundra or muskeg-like vegetation. Insects and small animals could exploit these wet places, while grazing mammals could move through a wider, sparse landscape. The evidence supports local water, plants and seasonal biological productivity; it does not allow historians to calculate the weather on a particular day in 31,165 BCE.

Far to the south, Castlepook Cave near Doneraile in County Cork preserves the richest known Irish vertebrate archive from the time leading towards the Last Glacial Maximum. More than 2,000 bones have been recovered from its chambers and galleries. Its dated remains extend across a very long span, approximately 45,700 to 19,950 years BP, so the assemblage is not a single community frozen in one moment. Nevertheless, it establishes that southern Ireland was visited by, or could support, animals including woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena. Later deposits include Arctic fox, wolf, Norwegian lemming and collared lemming.

The cave’s distinctive gallery names—Hyaena Hall, Elephant Hall and the Gallery of Aged Carnivores—are modern labels from exploration, not prehistoric place-names. They are reminders that cave deposits require taphonomic care. Hyaenas and other carnivores could have dragged carcass parts underground; water repeatedly disturbed sediments and bones; nineteenth- and early twentieth-century excavations recovered material before modern recording methods. A reindeer bone in the cave is reliable evidence that reindeer existed in the wider region at some point; it is not, by itself, proof of a hunting camp inside the chamber where it was found.

The Reindeer Femur Question

One Castlepook find makes this period unusually important for Irish history. A fragment of reindeer femur has been reported as about 33,000 years old and bears a deep linear mark that zooarchaeologist Ruth Carden has interpreted as damage made by a sharp stone tool while fresh bone was being processed. County Cork’s heritage record identifies the object as a Palaeolithic reindeer femur from Castlepook, now

in the National Museum of Ireland's Natural History collection. If the interpretation is sustained by further study, it would be the earliest known indication that people handled an animal in Ireland, by a very large margin.

That is a major claim, but it must be stated accurately. The radiocarbon result dates the animal bone, not the exact moment that a mark was made. A single modified bone cannot reveal how many people were present, whether they killed the reindeer or encountered an already dead animal, where the carcass was first processed, what tools they carried, or whether their visit lasted hours, days or longer. No securely associated stone-tool assemblage, hearth, dwelling surface, burial or intact butchered bone concentration has yet demonstrated a settlement in Ireland at this age. Castlepook's undisturbed deposits, where they survive, are therefore more important than ever.

It is also necessary to distinguish this early claim from the better-published evidence of later Palaeolithic activity. At Alice and Gwendoline Cave in County Clare, a brown-bear kneecap with cut marks produced two calibrated ranges centred around 12,800–12,600 cal BP. That find has been published in a peer-reviewed study. It shows human butchery much later than the Castlepook reindeer horizon, during the terminal Pleistocene. It cannot confirm people in Cork around 31,165 BCE; equally, the existence of later visitors does not make the earlier claim impossible.

People Without a Settlement

There is no responsible basis for describing political affairs, leaders, territories, warfare or diplomacy in Ireland at this date. There are no written records, human remains, settlements or artefact groups from which to infer a named community. Nor is there evidence for religion, formal ritual, art, schooling, long-distance trade or exchange networks on the island. The absence is not a judgement on the intellectual capacities of Upper Palaeolithic people elsewhere in Europe; it is a limit imposed by the Irish record.

If the Castlepook incision is anthropogenic, the most that can be said about everyday life is both modest and significant: one or more mobile hunter-gatherers may have had a practical encounter with a reindeer carcass in Ireland. Reindeer offered meat, marrow, hide, sinew, antler and bone, but the particular resource sought cannot be identified from one surviving mark. Comparison with contemporary hunter-gatherers in north-west Europe makes seasonal movement, close knowledge of animal behaviour and portable stone equipment plausible possibilities. Those comparisons are interpretation, however, not direct evidence that a defined group followed a regular route into Ireland.

Economically, the secure record is ecological rather than human. Large herbivores, predators and scavengers moved through an open landscape in which local wetlands supplied vegetation and water. Carnivores had their own influence on what survived in caves. Such ecological relationships were not "trade" or "politics", but they determined where a short human incursion, if it occurred, might have been viable. The reindeer femur may record an episode of carcass processing; it cannot show a permanent economy.

Changing Coasts and Vanishing Evidence

Lower global sea levels altered the shape of the Irish landmass and exposed areas now beneath the Irish Sea and Atlantic shelf. Yet lower sea level should not be converted automatically into a simple, continuous land bridge at every stage. Ice loading, local crustal movement, changing shorelines and

uncertain ice margins complicate palaeogeography. Any people who reached Ireland around this period may have crossed exposed terrain, narrow water barriers or a shifting combination of both. The physical route remains unresolved.

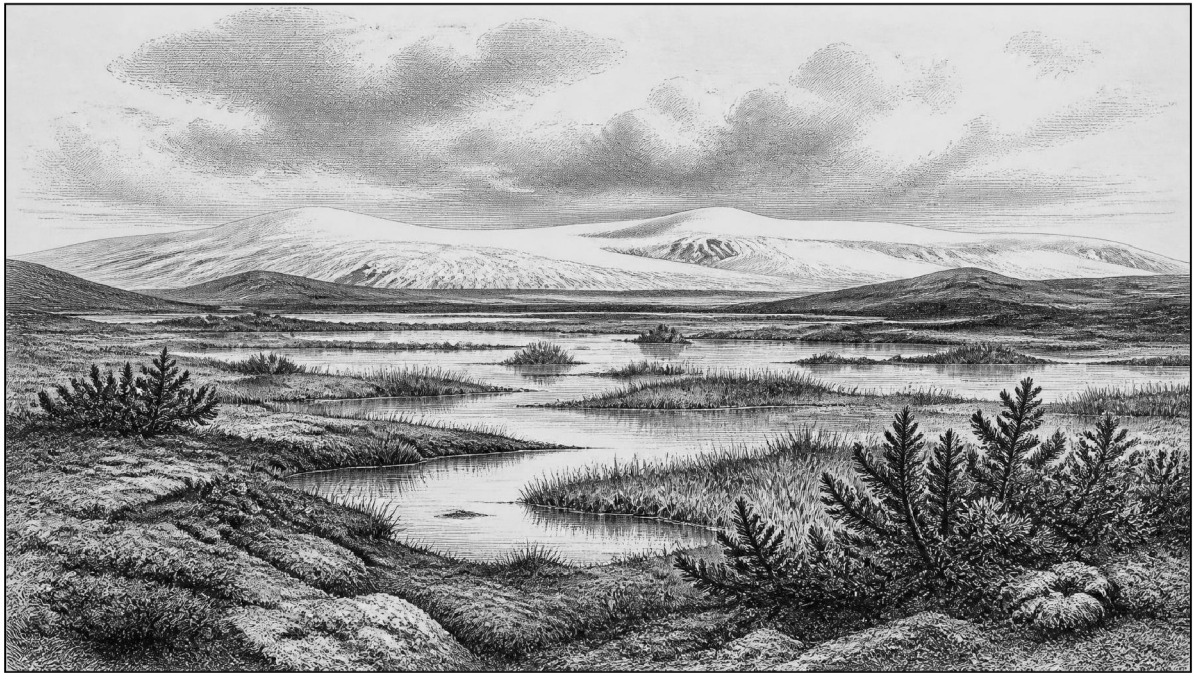
Later glacial expansion is part of the explanation for the fragmentary record. Ice eroded and redeposited sediments over extensive areas, while acidic soils destroy bone and organic remains. Caves and rare deposits sealed beneath till have consequently become disproportionately important archives. Derryvree preserves plants and freshwater conditions; Castlepook preserves a time-averaged animal assemblage and one provocative bone. Neither offers the sort of continuous archaeological landscape that would permit a conventional year-by-year narrative.

The central development around 31,165 BCE was therefore environmental instability on the threshold of major ice-sheet growth. Ireland contained at least some ice-free, treeless and biologically active terrain, though its extent changed through time. In County Cork, reindeer and other Ice Age mammals formed part of that world. The marked Castlepook femur raises the possibility that humans entered it too. For now, it should be treated as an earliest claim under investigation, not as proof of an established Irish population. The future history of this date will depend on new excavation, direct dating, microscopic study of bone surfaces and the recovery—if it survives—of securely stratified tools or occupation evidence.

Chapter 037 of 100

31164 BCE

Hyenahall's Long Bone Record^[37]



The label 31,164 BCE is a modern chronological convenience, not a recoverable Irish year. No calendar, written record or archaeological sequence can identify an event, person or season at that level of precision. In conventional archaeological terms it falls about 33,100 years before AD 1950, during the Late Pleistocene and Marine Isotope Stage 3. The responsible way to describe Ireland at this point is through broad calibrated ranges, geological layers and cautiously interpreted animal remains. The nearest evidence does not yield a national snapshot. It instead reveals particular places—especially a buried wetland in County Fermanagh and a cave system in north County Cork—whose deposits preserve fragments of a changing Ice Age world.

A Date Within Wide Ranges

Radiocarbon dating is essential to this history, but it does not transform it into an annal. A conventional radiocarbon measurement must be calibrated against changing atmospheric carbon levels before it can be compared with calendar years. Even then, uncertainties for material this old commonly extend across centuries or millennia. The modern date 31,164 BCE therefore belongs within a broad chronological neighbourhood, rather than marking the start or end of any identifiable Irish development.

The most useful nearby environmental sequence is at Derryvree, near Maguiresbridge in County Fermanagh. Road construction in 1969 exposed freshwater silts and fine sands caught between two thick tills within a drumlin. Till is sediment deposited directly by ice; its position above and below the organic layer shows that glacier ice affected the locality, then a freshwater environment developed, and later ice buried it. The organic deposits produced a conventional radiocarbon determination of 30,500 years BP,

with a substantial uncertainty. Later calibration has placed the evidence broadly within roughly 36,900–31,700 calendar years BP. That range overlaps the nominal date considered here, but it cannot prove what was happening at Derryvree in one particular year.

This distinction is more than technical. The stratigraphy securely demonstrates an interval when this part of Fermanagh was not overridden by ice and supported water, plants and animals. Its exact duration, its relationship to wider climate fluctuations and its precise correlation with deposits elsewhere remain matters of reconstruction. Ireland's ice cover did not necessarily advance or retreat evenly. Local evidence should not be turned into a simple island-wide map.

Derryvree's Cold Wetland

The Derryvree fossils nevertheless give unusually vivid evidence for the kind of landscape available during part of this late Ice Age interval. Pollen, plant macrofossils, mosses and insect remains indicate open, treeless vegetation in a severe periglacial setting. Grasses, sedges, juniper and herbs occurred alongside mosses; aquatic and wetland plants show that shallow freshwater persisted during at least the productive part of the year. The published interpretation is a cold, waterlogged tundra-like mosaic, often described as muskeg: pools, mossy margins, sedge-rich ground and patches of sparsely vegetated mineral soil.

That is not evidence for a featureless Arctic desert. The presence of freshwater organisms and plant matter points instead to ecological variety at a small scale. A shallow pool, wet hollow or sheltered margin could support life even where winter cold, frost disturbance and a brief growing season limited trees and dense vegetation. Yet Derryvree records one lowland basin, preserved by exceptional circumstances. It cannot tell us whether every ridge, valley and coast of Ireland looked the same. Nor can a few surviving pollen grains establish a forest: the combined evidence strongly favours open country rather than woodland.

The later burial of the deposit is equally important. Renewed glaciation protected the freshwater sediments beneath younger till, but the ice also reshaped and removed enormous amounts of older ground surface. This helps explain the scarcity of early archaeological sites. Any camps on exposed land might have been eroded, transported, submerged, buried beneath sediments or simply remain undiscovered. Absence of a settlement record is not proof that no person ever reached Ireland, but it means that permanent occupation cannot responsibly be inferred.

Ice Was Growing, Not Fixed

At this point in the wider last glacial cycle, Ireland stood before the fullest expansion of the British–Irish Ice Sheet. The global Last Glacial Maximum is usually placed about 26,500–19,000 years ago, while maximum ice positions in different Irish and British sectors were not simultaneous. Research on the ice sheet shows advances, retreats and locally different margins rather than one unchanging blanket of ice. Later maximum expansion covered all, or nearly all, Irish low ground and extended far onto the surrounding continental shelf, but that later landscape must not be projected unchanged back onto 31,164 BCE.

Evidence from western Ireland also suggests substantial ice-sheet loading and fluctuating marine conditions before the Last Glacial Maximum. Meanwhile, Derryvree and other northern sites preserve indications of ice-free or less heavily glaciated intervals during Marine Isotope Stage 3. Taken together,

these records support an Ireland of regional contrasts and rapid environmental change. Some areas were occupied by ice or lay close to its margins; elsewhere, cold freshwater basins and animal habitats existed. The precise configuration at the modern notional date is not known.

Sea level was lower globally than today because much water was locked in ice sheets, but local relative sea level depended also on the weight of ice depressing the land and on changing coastlines. Consequently, it is unsafe to picture a straightforward, permanent land bridge linking Ireland to Britain or continental Europe. People and animals may have crossed landscapes and coastal zones very different from those of today, but the available Irish evidence does not identify a route, a crossing date or a regular migration corridor.

Castlepook and the Animal Record

Far to the south, Castlepook Cave near Doneraile in County Cork—also known as Mammoth Cave—holds Ireland's richest known assemblage of vertebrate remains from the period leading towards the Last Glacial Maximum. Early excavators named chambers such as Hyenahall and Elephant Hall, memorable names that reflect the striking material recovered there. More than 2,000 bones have been recorded, and radiocarbon determinations from the cave span a long interval, from about 45,700 to 19,950 years BP.

The cave has yielded remains attributed to woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, with Arctic fox, wolf and lemmings among later Ice Age fauna. These species demonstrate that Ireland could support, or at least receive, cold-adapted and open-country mammals during parts of the Late Pleistocene. Reindeer in particular fit an open, seasonal grazing landscape; hyaenas and wolves remind us that large carcasses entered a food web involving predators, scavengers and dens.

But Castlepook is a repository, not a single moment sealed in time. Cave bones may have been dragged in by carnivores, accumulated through natural deaths, moved by water or disturbed by excavation. The species list should therefore not be read as a herd standing together in Cork in 31,164 BCE. Nor does it prove that all animals were present at the same time. Its real value is longer-term: it establishes that changing Irish environments during this phase were intermittently accessible to substantial mammals and carnivores.

The Reindeer Femur Question

One Castlepook object has particular bearing on human history. A reindeer femur in the old collection has been publicly reported as dating to about 33,000 years ago and bears a deep surface mark interpreted by zooarchaeologist Ruth Carden as damage made by a sharp stone tool during carcass processing. If that reading is confirmed, it would be remarkable evidence that people handled a reindeer in Ireland during the Upper Palaeolithic, many millennia before the better-attested post-glacial settlement record.

Its limits are just as important as its promise. The bone derives from an old cave collection, not a modern excavation of an intact occupation floor. No securely associated stone-tool assemblage, hearth, dwelling, burial, artwork or repeated sequence of human activity of this age has been established at Castlepook. The animal's date identifies when the reindeer lived; it does not, by itself, identify the person who may have marked it, where processing occurred, whether the animal was hunted or scavenged, or how long anyone stayed.

The most restrained interpretation is therefore a possibility of brief human visitation and carcass processing, not a settled population and certainly not a named community. There is no evidence from Ireland at this date for political institutions, warfare, diplomacy, farming, pottery, metalworking, trade networks or formal religious monuments. There are likewise no grounds for assigning language, ancestry or ethnicity to any possible visitors. If humans were present, they were most plausibly highly mobile foragers using stone cutting edges and making decisions within an unstable cold-climate environment; that remains an inference, not a directly observed social world.

What Everyday Life Cannot Yet Reveal

For this period, the environment is the principal history. Derrynvree shows cold freshwater habitats and open vegetation; Castlepook records a long sequence of animal life and carnivore activity; glacial research shows an island entering a phase of major ice-sheet growth. These sources illuminate survival conditions rather than domestic routines. There are no houses from which to reconstruct family life, no hearths to identify meals, no textiles, no burials and no tools securely tied to this date in Ireland.

That restraint does not make the period empty. It reveals a deeply altered Ireland: an island or near-island of shifting coastlines, exposed cold ground, wetlands, grass and sedge habitats, large herbivores and powerful scavengers, increasingly constrained by expanding ice. The evidence also shows why later landscapes conceal so much of this earlier past. Around 31,164 BCE, Ireland's story is not one of kingdoms or events. It is the difficult, compelling history of environments briefly preserved between advances of ice, and of a single marked bone that asks—without yet conclusively answering—whether people were among them.

Chapter 038 of 100

31163 BCE

Cork's Earliest Butchery Debate^[38]



31,163 BCE is a modern calendar label, not a date that can be recovered from the Irish archaeological record. It corresponds only approximately to 33,100 years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3. No Irish deposit can identify a particular year, season, person or happening at this distance. Radiocarbon ages carry statistical uncertainty and must be calibrated; sediment layers and animal bones commonly represent longer intervals still. The responsible question is therefore not what occurred in Ireland in this nominal year, but what securely dated evidence can illuminate the island during the surrounding millennia.

That evidence places Ireland in a changing Ice Age world, before the fullest development of the last Irish Ice Sheet. The island was neither a settled country nor an empty abstraction. It was a northern Atlantic landscape in which ice, exposed ground, water, plants and animals repeatedly altered their ranges. A small number of cave deposits, organic beds beneath later glacial sediments, landforms and palaeoclimate records allow a cautious reconstruction. They do not supply a conventional political or social history.

A Date Without Annual Precision

The nearest useful chronological anchors are broad calibrated ranges. At Derryvree near Maguiresbridge, County Fermanagh, freshwater silts and fine sands sealed between two tills produced the conventional radiocarbon determination BIRM-166, 30,500 +1,170/-1,030 radiocarbon years BP. Later discussion places its calibrated range at roughly 36,900-31,700 years ago. That broad span embraces the notional date of 31,163 BCE, but it does not prove that the wetland existed unchanged throughout it, or that every fossil within it is exactly contemporary. What it securely demonstrates is an interval when this part of Fermanagh was ice-free enough for freshwater sedimentation before renewed ice overran the area.

There is a comparable need for restraint at Castlepook Cave near Doneraile in north County Cork. Its deposits have yielded one of Ireland's most important collections of Ice Age animal remains, but antiquarian excavation, mixed cave sediments and later disturbance mean that the assemblage is not a snapshot. Mammoth, reindeer, giant deer, brown bear, wolf, fox, lemmings and spotted hyaena are evidence that such animals reached Ireland during parts of the Late Pleistocene; they cannot all automatically be placed in one herd, one season or even one climatic phase. The Irish Quaternary Fauna Project made precisely this point by re-dating specimens and exposing the limits of older provenances.

An Island Entering a Colder Phase

By about 33,000 calibrated years ago, the last glaciation was intensifying, but Ireland had not yet reached the familiar maximum extent of ice usually placed around 27,000–23,000 years ago. Recent ice-sheet modelling treats 32,000–23,000 years ago as a build-up phase that differed substantially between regions. At around 31,000 years ago, the model simulations show smaller ice caps on high ground in north-west Ireland rather than a single, fully developed ice sheet covering the whole island. After that point, separate ice masses expanded and merged rapidly. This is a model-based reconstruction, not direct proof of the exact ice margin in every Irish valley.

Other evidence makes the picture more complicated, and more interesting. Marine microfauna and shells from western Ireland indicate substantial ice loading between about 40,000 and 19,000 calibrated years ago, while geomorphology shows that the eventual ice sheet advanced to the continental shelf edge in several sectors. Ice expansion was asynchronous: a coastline, upland or basin could have had a different history from another part of the island. Thus no single sentence such as 'Ireland was ice-covered' can responsibly describe every location around 31,163 BCE.

Sea level was lower globally than today, yet lower water did not necessarily create an easy terrestrial corridor to Britain or continental Europe. Ireland's surrounding seabed drops comparatively quickly, and reconstructions suggest that maximum exposure around much of the island may have extended only about 30 kilometres beyond the modern shore. Ice, sea ice, channels and local relief all mattered. Animal movement between Ireland, Britain and the European mainland was possible at favourable times, but the route, frequency and seasonality cannot be reconstructed from bones alone.

Fermanagh's Open Wetland

Derryvree supplies the clearest local environmental evidence close to this nominal date. The road cutting revealed a freshwater bed preserved beneath a drumlin: a chance exposure of a landscape later buried and reshaped by moving ice. Its plant and animal remains indicate open tundra vegetation and a periglacial climate. Insects point to a moss-rich, waterlogged setting with open pools and abundant plant matter, rather than to a dense forest or a featureless frozen desert. The site records a particular wetland basin, not the whole island, but it makes an invaluable correction to the notion that Ice Age Ireland was uniformly sterile.

The vegetation was sparse and cold-adapted. Herb pollen, moss macrofossils and aquatic plants indicate ground capable of supporting seasonal growth where liquid water persisted. The old deposits have also mattered to modern biogeography: the fossil record at Derryvree includes evidence relevant to Ireland's Arctic-alpine flora, including fringed sandwort. Such finds show that plant communities could survive in sheltered, moist local habitats even within a generally severe climate. They do not demonstrate woodland, farming, deliberate cultivation or permanent human management.

For grazing animals, an open mosaic of herbs, grasses, sedges, mosses, wet hollows and better-drained ground could offer forage, although conditions must have been harsh and unstable. Reindeer were well adapted to cold, open country. Mammoths elsewhere in northern Europe occupied open or semi-open tundra-steppe habitats during Marine Isotope Stage 3, and their Irish remains make a broadly similar habitat plausible during some intervals. Giant deer, predators and scavengers would have depended on the same shifting ecological network. This remains an interpretation from fossils, ecology and regional comparison, not a census of animals in Ireland in one year.

The Marked Reindeer Bone

The most arresting human question is a reindeer femur from Castlepook. It has been presented as bearing a groove made by a sharp stone tool and as dating to about 33,000 years ago. If that identification is accepted, it is evidence that a person or people processed a reindeer in Ireland during the broad period represented by this article. It would push the island's known human story far earlier than the later Mesolithic settlement.

Yet the claim must remain carefully bounded. The object is a single worked bone from a cave collection, not a sealed occupation floor. No securely associated hearth, stone-tool assemblage, dwelling, burial, repeated butchered assemblage or human remains of comparable age has been recovered from Castlepook. A tool mark may record a brief visit, scavenging or butchery at another location before the bone entered the cave; it cannot establish a resident community. The cave's mixed deposits also require continued re-examination with modern dating and taphonomic methods. Recent work on other Irish cave collections has shown why direct dating, sediment history and the routes by which bones entered a cave are decisive.

Even a genuine butchery mark does not reveal whether the animal was hunted, found dead, taken from another predator or obtained by people passing through a wider Irish-British landscape. Nor does it disclose language, kinship, population size or cultural affiliation. Contemporary Upper Palaeolithic communities elsewhere in Europe possessed sophisticated stone technologies, social ties and symbolic practices, but importing those characteristics into Ireland without an Irish assemblage would be speculation.

No Polity, No Trade Network

There is no evidence for political authority, territories, diplomacy, warfare, chiefs, ritual monuments, formal religion or institutions in Ireland at this time. Nor can archaeology identify an Irish economy in the later historical sense. No farms, fields, houses, storage pits, pottery or exchange goods belong to this horizon. The most that can be said is that wild animals moved through, and perhaps people occasionally entered, a landscape whose available resources were governed by climate and ice.

If visitors did reach Ireland, everyday survival would have demanded mobility, knowledge of animal behaviour, fuel and shelter, and an ability to move through a dangerous seasonal environment. That is a reasonable inference from Ice Age conditions, not direct Irish evidence. It should not be converted into imagined camps on every shore, fur-clad families beneath every limestone overhang, or an established hunting territory centred on Castlepook.

What This Moment Means

The importance of the period around 31,163 BCE lies in transition. Derryvree records ice-free tundra wetland in Fermanagh before later burial beneath ice-related deposits. Castlepook demonstrates that Ireland formed part of a wider Late Pleistocene animal world and preserves a tantalising, still limited case for human action. Cave calcite from Crag Cave in Kerry independently records episodes when liquid water could circulate underground during Marine Isotope Stage 3, reinforcing the conclusion that the climate fluctuated rather than remaining uniformly glacial.

Within a few thousand years, expanding ice would remodel much of the island, erode older surfaces and destroy or conceal much of the evidence needed for a fuller story. That destructive power is itself why the surviving wetland silt, cave bone and calcite matter so much. Ireland around this notional year was not a nation awaiting history. It was a changing northern landscape, intermittently habitable for plants and animals, perhaps briefly visited by people, and already entering the long advance towards the last glacial maximum.

Chapter 039 of 100

31162 BCE

BIRM-166's Closing Waters^[39]



The label 31,162 BCE gives a useful place in a modern chronology, but it cannot identify an event in Ireland on a particular year, season or day. Expressed approximately in the archaeological convention of years before AD 1950, it falls around 33,111 cal BP. That lies within the broad calibrated range associated with a rare Fermanagh deposit, not within an annual record. Ireland at this depth of time belongs to the later part of Marine Isotope Stage 3, a highly variable interval of the last Ice Age. Its history must be assembled from sediment, fossil pollen and plants, insects, animal bones, cave deposits and the landforms left by moving ice—not from written testimony, named peoples or dated monuments.

The Derryvree Window

The most informative Irish evidence is from Derryvree townland near Maguiresbridge, County Fermanagh. Road-cutting in 1969 exposed a drumlin containing two thick and distinct sheets of glacial till, separated by freshwater silts and fine sands rich in organic material. This order of layers is the essential fact: glacier ice deposited the lower till; an ice-free interval then permitted freshwater sediments, plants and animals to accumulate; later ice overrode or sealed the deposit beneath the upper till. The deposit is consequently a window onto conditions in north-central Ireland between major glacial episodes, rather than proof that all parts of the island looked alike at once.

The Derryvree organic horizon, BIRM-166, returned a conventional radiocarbon age of 30,500 radiocarbon years BP, with a sizeable uncertainty. Subsequent calibration has commonly placed it broadly between about 36,900 and 31,700 calibrated years BP. The nominal modern date in question therefore falls inside the range, but very near neither a securely identifiable beginning nor a known ending. Calibration is not a device for manufacturing exactness: it converts a radiocarbon measurement into a

probability range by comparison with changing atmospheric carbon records. The responsible conclusion is that Derryvree illuminates a span of millennia around this date, not that a particular pool, animal or plant can be assigned to 31,162 BCE.

An Open Tundra Wetland

Within that window, the evidence points to an open, treeless tundra landscape under a periglacial regime. “Periglacial” does not simply mean frozen: it describes terrain subject to severe seasonal cold, repeated freezing and thawing, unstable wet ground and short growing seasons at the margin of glacial conditions. Derryvree’s freshwater deposits contained a flora and fauna described by their excavators as having a full-glacial aspect. Later syntheses identify an environment resembling muskeg: mossy, organic-rich wetland with open pools, shallow water and abundant plant matter.

That was not a forested Ireland, nor a uniformly sterile polar desert. Sedges, grasses and mosses could colonise damp hollows and the margins of pools. Cold-adapted wetland plants recorded from the wider Fermanagh evidence include bogbean, mountain-avens and lesser clubmoss. Such species indicate local habitats—waterlogged ground, exposed mineral soils, wet margins and tundra vegetation—rather than a simple national climate reading. Beetles, plant macrofossils and pollen are especially valuable because they preserve the small-scale texture of a landscape that later ice largely erased. They suggest life concentrated where meltwater, springs or shallow basins created refuge from the driest and most exposed ground.

In practical terms, the seasons would have imposed the strongest rhythm. Winters were severe; the ground could remain frozen for long periods; and summer productivity was brief but potentially intense in sheltered wetland patches. There is no basis for assigning temperatures to this one nominal year, because Derryvree is not a high-resolution thermometer and MIS 3 climate shifted abruptly on millennial and shorter scales. Yet the combined biological evidence supports a landscape in which water, snow, frost and sparse vegetation structured every available ecological opportunity. This is the proper setting for the date: not a settled countryside, but a cold mosaic of pools, mossy ground, sedge margins and open tundra.

Ice in Motion, Not a Fixed Boundary

At roughly 33,000 calibrated years ago, Ireland was moving towards the major expansion of the British–Irish Ice Sheet, but neither the onset nor the maximum of glaciation can responsibly be compressed into one island-wide moment. A widely used working model places ice-sheet build-up after about 35–32 ka, its maximum extent broadly between 27 and 21 ka, and later readvances after 19 ka. Other studies stress regional differences, uncertain offshore limits and ice margins that advanced or paused at different times. Thus, Derryvree’s locally ice-free wetland should not be mistaken for evidence that the whole island was simultaneously free of ice.

Greenagho, also in County Fermanagh, supplies a related but older signal: organic material from beneath till has been calibrated to approximately 37,200–35,700 years BP. Together, such sites show that parts of northern Ireland preserved freshwater or terrestrial conditions before later glaciation. Crag Cave in County Kerry adds a different kind of archive. Uranium-thorium dates from reworked speleothems demonstrate episodes of calcite formation during the last glacial period, evidence that subterranean water regimes responded to wider climatic fluctuations. Neither site gives a travel diary of ice, but both warn against imagining an unchanging frozen island.

The resulting regional picture is dynamic. Ice, meltwater, wind-blown sediment and frost action continually altered drainage and land surfaces. Sea level was lower globally than today, but the changing geography of the Irish Sea, the extent of marine-terminating ice and possible routes between Ireland, Britain and continental Europe remain matters for reconstruction, not demonstrated journeys. It is safer to say that ecological connections could open and close as climate, sea level and ice margins changed than to claim a particular migration corridor for this precise date.

Cave Bones and Their Limits

Southern Irish caves provide a complementary, but more difficult, glimpse of Ice Age animal life. Castlepook Cave near Doneraile, County Cork, has produced remains attributed to woolly mammoth, reindeer, giant deer, brown bear, spotted hyaena, wolf, Arctic fox, stoat, mountain hare and lemmings. These animals show that Ireland was intermittently accessible to a diverse cold-stage fauna during MIS 3. Reindeer and lemmings are particularly evocative of open, cold environments; large herbivores and carnivores indicate food webs extending well beyond a small Fermanagh wetland.

But the cave record cannot be treated as a census for 31,162 BCE. Many Irish cave deposits were excavated in the nineteenth and early twentieth centuries, often before modern recording methods; bones may have been moved, mixed or redeposited. Improved pretreatment and redating have shown that some Castlepook specimens are substantially older than earlier determinations suggested. The redated evidence indicates that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum, around 40,000 cal BP. Accordingly, it would be unjustified to place a hyaena, mammoth herd or reindeer carcass at Derryvree—or anywhere in Ireland—in this exact year simply because the species occurs in the broader record.

No Polity, No Settlement Record

There is no evidence for political communities, diplomacy, warfare, religious institutions, trade networks, permanent settlements, farming or artistic traditions in Ireland at this date. There are no securely dated Irish houses, hearths, stone-tool assemblages, graves or human remains from around 33,111 cal BP. Nor can ordinary social life be reconstructed by borrowing the well-known practices of Upper Palaeolithic groups in continental Europe or Britain. Similar climates can support human activity, but environmental possibility is not archaeological proof.

The distinction matters because Ireland's evidence for Palaeolithic people remains exceptionally slight and much later than this date. The National Museum of Ireland states that no clear evidence demonstrates human presence during the Palaeolithic; the debated and important butchered brown-bear bone from Alice and Gwendoline Cave, County Clare, dates instead to about 12,810–12,590 cal BP. That final-Palaeolithic find cannot be projected back twenty thousand years. It does, however, demonstrate why absence of evidence must be phrased carefully: glaciation, erosion, changing shorelines and the scarcity of surviving deposits have made Ireland a difficult archive.

A Landscape Before History

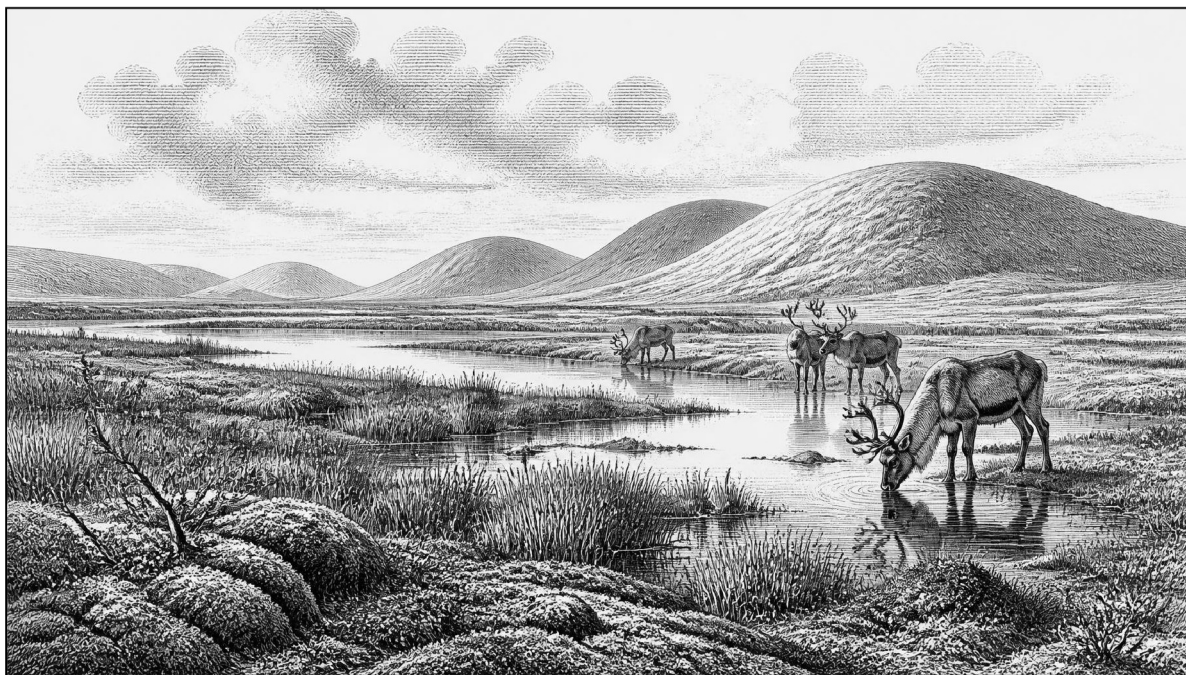
For Ireland around 31,162 BCE, the major development was environmental rather than political: a late MIS 3 world in transition towards fuller glaciation. Derryvree preserves the most vivid local scene—a freshwater tundra wetland temporarily occupying ground that ice had left and would later bury. Cave

faunas show that the island, across a broader and not necessarily simultaneous span, supported elements of a cold-adapted mammal community. The measured evidence is powerful precisely because it is limited. It establishes changing ice cover, open vegetation, freshwater habitats and animal possibilities; interpretation may sketch a harsh, seasonally productive landscape. It cannot furnish a ruler, a battle, a people or a calendar-year event.

Chapter 040 of 100

31161 BCE

Derryvree's Sedge Horizon^[40]



“31,161 BCE” is a modern chronological label, not a year that can be recovered from an Irish record. No calendar, written testimony, named community or datable event survives from this depth of time. In radiocarbon convention it lies approximately 33,110 years before AD 1950, but that conversion should not suggest annual precision. The responsible scale is a broad calibrated interval of millennia. Around this notional point, Ireland belonged to the Late Pleistocene, within Marine Isotope Stage 3: a climatically unstable part of the last Ice Age, before the fullest expansion of the last British–Irish Ice Sheet.

The closest Irish environmental evidence comes not from a settlement but from a buried wetland at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed silts, fine sands and organic layers trapped between two distinct sheets of glacial till. The deposit was therefore formed after an earlier ice advance and before later ice covered the site again. Its conventional radiocarbon determination, roughly 30,500 radiocarbon years BP with a substantial uncertainty, has been calibrated broadly to about 36,900–31,700 years ago. That range overlaps the date in question, though it cannot identify conditions in one particular season, decade or year.

A Wetland Between Ice Advances

Derryvree is exceptionally valuable precisely because later ice and erosion have destroyed or disturbed so much of Ireland’s older Pleistocene evidence. It preserves a small, local episode when liquid fresh water, sediment and plant matter accumulated in a low-lying basin. Mosses, sedges and other freshwater or wet-ground plants, along with insect remains indicating cold northern conditions, show that this was not a forested or cultivated countryside. It was a cold, open environment with shallow water,

marshy margins and short growing seasons. The evidence supports a mosaic of wetland and sparse tundra-like vegetation; it does not support a detailed national map, an exact annual temperature or a claim that all of Ireland looked alike.

Other Fermanagh deposits, at Hollymount and Greenagho, also indicate intervals of cold but non-glacial conditions during the Midlandian, the Irish name commonly used for the last glacial cycle. Their ages and correlations are imperfect, and individual measurements have different degrees of reliability. Taken together, however, they demonstrate an important point: Ireland's Ice-Age history was not a single, uninterrupted freeze. Ice margins shifted, local water bodies formed and vanished, and ecological opportunities opened briefly before renewed glaciation sealed or removed much of the record.

That changing landscape is the principal "political geography" available for this article. There were no states, chiefs, boundaries, diplomatic missions or warfare attested in Ireland. To write of territorial control, alliances or raids would be invention. The forces organising life were instead ice, wind, meltwater, vegetation, animal movement and access across a north-west European landscape whose coastlines and sea levels differed greatly from those of today.

The Approaching Ice Sheet

The date falls during a difficult phase in reconstructing the British-Irish Ice Sheet. Research published in recent years has shown that its growth was neither simple nor synchronous. Some sectors had ice earlier than others; upland ice caps, marine margins and regional glaciers could advance or retreat on different schedules. By about 31,000 years ago, a substantial Scottish ice sheet was developing, and rapid expansion followed in the wider British-Irish system. Yet the precise extent, thickness and timing of ice over every part of Ireland at approximately 33,100 calibrated years ago remain uncertain.

Derryvree's inter-till wetland proves that its own Fermanagh locality was ice-free long enough for freshwater sediments and organic material to build up before a later glacier overrode it. It does not prove that the whole island was ice-free at the same time. Conversely, evidence for growing ice in northern and western sectors cannot be used to declare the entire island uniformly ice-covered. The most defensible picture is regional change: areas of exposed ground and wetland existed amid a broader glacial world in which routes, habitats and coastlines could alter rapidly.

Sea level was lower than today because large volumes of water were stored in continental ice sheets. Much of the modern shelf around Ireland was exposed or shallower, but this fact alone does not demonstrate a continuous, walkable land bridge to Britain or continental Europe at this particular moment. The configuration of marine channels, ice fronts, lowlands and possible crossings changed over time. Mammal movement shows that Irish environments were not biologically isolated throughout MIS 3, but it cannot identify a single route or establish how often animals, let alone people, crossed.

Reindeer, Hyenas and Cave Archives

Southern Irish caves provide a second, striking body of evidence. Castlepook Cave, near Doneraile in north County Cork, produced Ireland's richest known assemblage of pre-Last Glacial Maximum mammals. Its Ice-Age bones include reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyena. Such a list should not be treated as a census from one day. The cave was excavated principally in the late nineteenth and early twentieth centuries, before modern stratigraphic methods, and its deposits accumulated over long periods. Carnivores could drag prey into chambers; water, frost and earlier digging could also mix material.

Nonetheless, the fauna establishes that cold-adapted and open-country animals reached Ireland during MIS 3. Reindeer and lemmings are especially consistent with exposed, cold environments, while the large herbivores indicate that enough forage existed, at least seasonally, to support substantial animals. Spotted hyenas are important not because they make Castlepook an African-like landscape, but because Pleistocene cave hyenas were northern Eurasian predators and scavengers capable of accumulating bone assemblages in caves. Tooth-marked and chewed bones accordingly warn against assuming that every carcass was killed, butchered or eaten by people.

Improved radiocarbon pretreatment has significantly revised the chronology of the Castlepook material. Dates once thought younger have proved to be between roughly 5,000 and 12,000 radiocarbon years older, placing much of the key fauna securely in MIS 3. This is a major methodological lesson for the year under review: old museum collections can acquire new historical importance when specimens are re-examined, directly dated and compared with revised glacial chronologies. But it is also a reason for restraint. A cave bone may securely date an animal's death without securely dating its deposition, its modification or an associated human visit.

The Human Question

A reindeer femur from Castlepook has made this period especially significant for Irish prehistory. Zooarchaeologist Ruth Carden identified a deep incision interpreted as damage made by a sharp stone implement on fresh bone. Public heritage accounts have associated the specimen with a date of around 33,000 years ago and have presented it as evidence for very early human activity in Ireland. If the interpretation is confirmed, it would indicate that somebody processed a reindeer carcass in Ireland during the Upper Palaeolithic, far earlier than the formerly accepted record of human presence.

The claim must be framed exactly. It is evidence for a possible act of carcass processing, not proof of a permanent settlement, a named people, a hunting territory or a continuous population. No securely associated hearth, stone-tool assemblage, dwelling floor, burial, artwork or stratified camp has yet been recovered from Castlepook for this period. The direct date concerns the bone, rather than the exact moment at which the incision was made. Nor can a single modified bone resolve whether people arrived by a land route, crossed water, visited briefly, hunted locally or scavenged an animal already brought into the cave by predators.

For 31,161 BCE specifically, the find is relevant as part of a broader MIS 3 horizon rather than as an event dated to that year. It is responsible to say that Ireland may have been visited by Upper Palaeolithic people in the wider period represented by Castlepook. It is not responsible to populate the island with a settled hunting community at this exact date. The absence of evidence is partly a preservation problem: later glaciers scoured landscapes, while caves preserve selective and often disturbed traces. Even so, archaeology must distinguish what later loss makes possible from what surviving evidence actually demonstrates.

Life Without Institutions

Nothing supports discussion of government, diplomacy, religion, formal learning, trade networks, farming or domestic life in Ireland at this date. There were no fields, livestock, pottery, metalwork, monuments or houses known from the island. There is no evidence for ritual use of Castlepook Cave, despite the importance of caves in Palaeolithic art elsewhere in Europe. Neither should sophisticated

Upper Palaeolithic cultures documented on the continent be automatically projected across the Irish Sea. Similar climate zones and animal communities do not themselves prove shared language, identity, technology or belief.

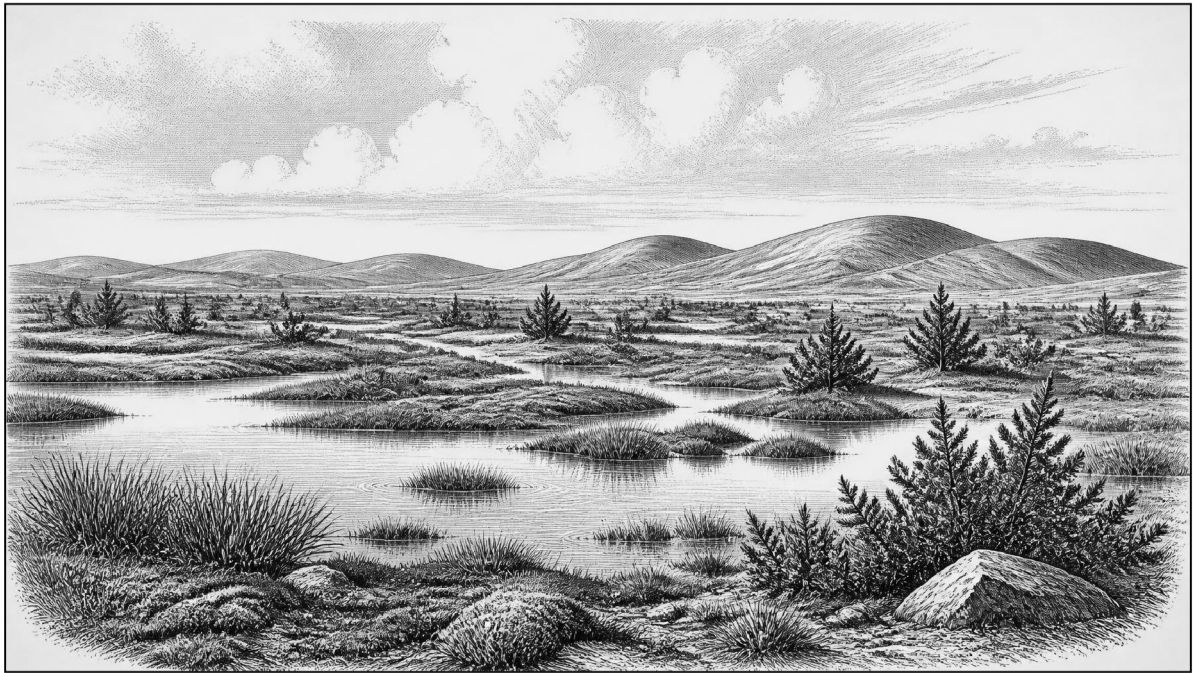
Economy, if people were present at all, can only be discussed at the most elementary level: the possible acquisition and processing of animal food, hide, sinew, bone or antler. Even this remains an inference from one modified reindeer bone, not a demonstrated subsistence system. Animal populations themselves were shaped by seasonal forage, predation and changing access to open ground. Wetlands such as Derryvree may have provided water, sedges and sheltered microhabitats, while surrounding open terrain supported grazing animals. These are ecological possibilities grounded in the deposits, not evidence for planned human resource management.

The year's real historical subject is therefore not an episode in a national narrative but a fragile archive. Derryvree's sedge-rich freshwater horizon captures an interval of life between ice advances in Fermanagh. Castlepook preserves a separate southern record of Ice-Age animals and a tantalising possible human action. Together they reveal an Ireland that was environmentally dynamic, locally habitable for specialised plants and animals, and perhaps briefly accessible to people. They do not yet reveal a society. That distinction is what makes the evidence both limited and extraordinary.

Chapter 041 of 100

31160 BCE

Derryvree's Intertill Exposure^[41]



Modern calendar-year precision is not available for Ireland in 31,160 BCE. No written record, indigenous calendar or archaeological sequence can identify an event occurring in that particular year. The date is a modern point on a deep-prehistoric timeline: roughly 33,110 years before the 1950 reference year used in 'BP' dating. The responsible history is therefore one of calibrated ranges, buried sediments and probabilities. Around this notional date, Ireland lay within the later part of Marine Isotope Stage 3, a long, climatically unstable interval of the last Ice Age, before the fullest expansion of the Last Glacial Maximum ice sheet.

A Date Within a Range

The closest Irish environmental evidence is the Derryvree sequence near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and revealed an exceptional layer of organic freshwater sediment between two thick sheets of glacial till. The layer produced radiocarbon determination BIRM-166: 30,500 radiocarbon years BP, with a substantial laboratory uncertainty. Calibration has placed the deposit broadly at about 36,900–31,700 calibrated years BP. That range includes 31,160 BCE, but it must not be mistaken for a date for one year, one season or one episode of human activity.

Derryvree is important precisely because its position between tills preserves a sequence of environmental change. A lower glacial deposit indicates an earlier phase when ice or ice-derived sediment reached the area. Above it, fine sands, silts and moss-rich organic material accumulated beside freshwater. A further glacial deposit then sealed the wetland. The sequence demonstrates that this part of Fermanagh was ice-free for a significant interval before renewed glaciation; it does not provide a neat island-wide map of ice margins at 31,160 BCE.

A Cold, Living Wetland

The fossils in the Derryvree deposits provide the clearest available picture of conditions near this broad date. Pollen, plant remains, mosses and insects point to an open, treeless and periglacial landscape. Grasses, sedges, herbs and juniper were part of the vegetation, while waterlogged hollows supported mosses and shallow pools. Earlier researchers described this as muskeg: wet, peaty, mossy ground rather than forest, cultivated land or a permanently snow-covered desert. Frost action and severe winters were integral to the setting.

This evidence should be read at its proper scale. A sediment basin records its own catchment particularly well: the plants growing beside the water, material washed in from nearby ground, and insects living in local habitats. It cannot show that every ridge, valley and coast of Ireland looked identical. Nevertheless, Derryvree establishes a crucial point. Parts of Ireland supported freshwater ecosystems and sparse but productive tundra-like vegetation during an interval often imagined too simply as unbroken ice.

Such terrain was demanding but not lifeless. During the growing season, grasses, sedges and herbs could feed grazing animals; moss beds, pool margins and damp ground offered niches for insects and small creatures. Winter conditions were far harsher, and the available evidence suggests a landscape with short productive summers, exposed ground and strong seasonality. The familiar Irish mosaic of oak woodland, enclosed fields, peat bog and settled coast had no place here. Even the outline of the modern landscape was being repeatedly altered by frost, meltwater and ice.

Ice, Water and Uneven Change

The wider geological context remains difficult. The British–Irish Ice Sheet was not a fixed body with one simple advance and retreat. It grew, reorganised and fluctuated over long periods, while different sectors responded differently to climate, snowfall, sea level and ice flow. Recent modelling and re-evaluation of dated evidence treat Derryvree as an important constraint on pre-Last Glacial Maximum ice-free conditions in north-western Ireland. Yet they also underline the limits of the evidence: older radiocarbon determinations and disturbed sediments cannot resolve every movement of ice.

The major maximum of the final Irish ice sheet came later, broadly during the period around 26,000–21,000 calibrated years BP. At the time represented by Derryvree, conditions were already cold and unstable, but the final maximum was not simply a fact accomplished everywhere. The organic layer was eventually overwhelmed or buried by renewed ice-related deposition. Its survival beneath a drumlin is therefore both fortunate and revealing: the deposits preserve a wetland that later glacial processes largely removed or concealed elsewhere.

Crag Cave in County Kerry supplies a different kind of evidence for this uneven climate. Speleothems, or cave calcite deposits, formed only during episodes when water could move through the ground and cave system. Uranium-thorium dating shows that such deposition occurred intermittently in south-west Ireland during Marine Isotope Stage 3. It does not prove that Kerry and Fermanagh had identical local weather, but it supports the broader conclusion that cold conditions were punctuated by environmental shifts rather than remaining uniformly frozen.

Castlepook's Time-Mixed Fauna

In north County Cork, Castlepook Cave near Doneraile offers a complementary archive. Its old excavations produced the richest known Irish Late Pleistocene assemblage of large mammals, including reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Radiocarbon work has shown that animal remains there span different parts of the late Pleistocene. Some specimens belong broadly to the pre-Last Glacial Maximum world relevant to this article, while others are much later. Castlepook is consequently evidence for repeated animal presence in Ireland, not a single simultaneous menagerie.

The cave's formation history matters. Carnivores could drag carcass parts underground; water, collapse, burrowing and early excavation could displace bones; and a cave deposit may accumulate over thousands of years. Reindeer remains support the existence of open grazing country during favourable intervals. Hyaenas and wolves show that large herbivores formed part of a predator-and-scavenger food web. Mammoth and giant-deer remains add to the impression of a cold, open-country fauna, but do not allow a precise reconstruction of animal numbers, migration routes or the season represented by any individual bone.

Repeated faunal arrivals also demonstrate that Ireland was not an ecological island in the modern sense throughout this period. Animals had routes into and out of the island's landscapes, although the changing relationship between sea level, land, ice and coast makes any specific route difficult to prove. The fossil record cannot establish whether every species arrived during the same interval, or whether all could have moved across a continuous land connection at the same time.

The Human Question

A reindeer femur from Castlepook has made this remote period unusually consequential for Irish archaeology. County Cork heritage research has presented the bone, approximately dated to 31,000 BCE, as bearing a deep mark made by a sharp stone tool during carcass processing. If that specialist interpretation is sustained, it may indicate that Upper Palaeolithic people handled a reindeer in Ireland around this broad period. It would be an exceptionally early trace, long before the better-established terminal-Pleistocene evidence from Alice and Gwendoline Cave in County Clare.

It is not, however, evidence for a settled population, a village or a named people in Ireland in 31,160 BCE. The femur came from an old, complex cave collection, not from a sealed occupation floor containing hearths, stone tools, shelters and repeated domestic refuse. The radiocarbon age dates the animal's death, not the incision itself. Nor can one mark identify who made it, whether they killed the animal or scavenged it, how many people were present, or whether they stayed beyond a brief visit. No securely associated lithic assemblage, human burial, dwelling, ornament or cave art of comparable age has been found in Ireland.

Accordingly, political affairs, diplomacy and organised conflict cannot responsibly be described. There is no evidence for territories, leaders, institutions, warfare or alliances. There is equally no direct Irish evidence for formal religion, burial practice, language, music, art or systems of learning at this date. If people did reach Ireland, they belonged somewhere within the wider Upper Palaeolithic world of mobile hunter-gatherers in north-west Europe; that is a geographical and technological context, not an excuse to supply details absent from the Irish record.

Economy Without Settlement

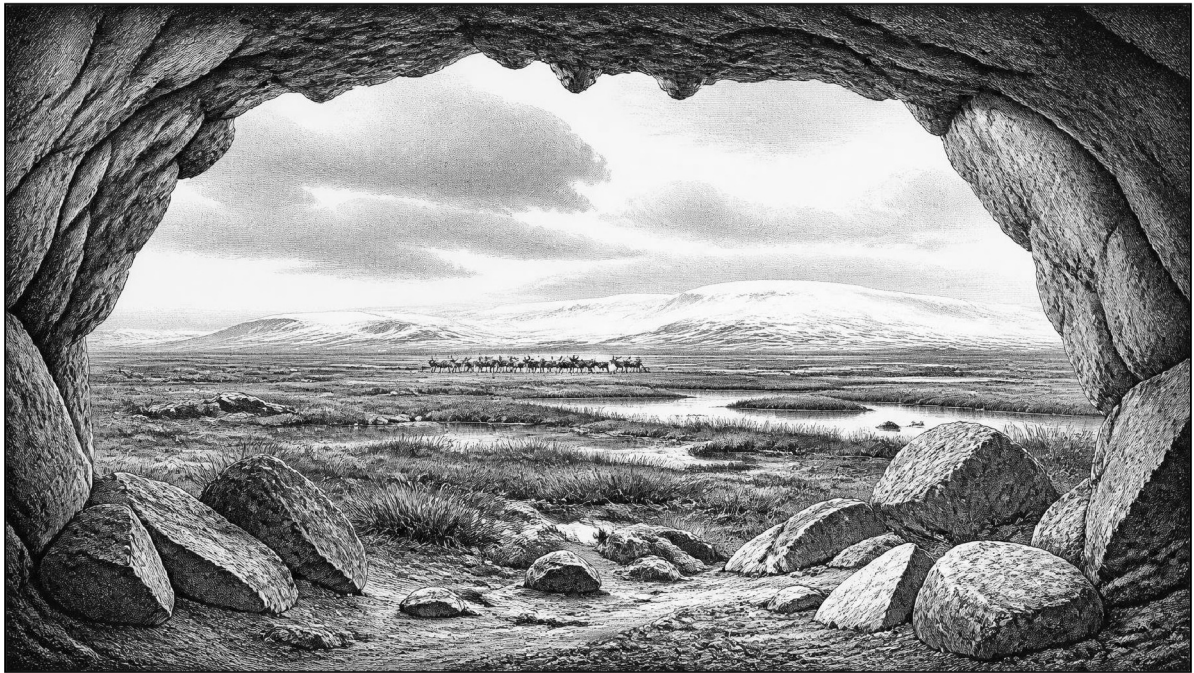
The only cautiously supportable economic inference is narrow. A genuine stone-tool mark on the Castlepook femur would show the use of a sharp cutting edge on an animal carcass, perhaps in removing meat, hide, sinew or marrow. It would not demonstrate organised hunting, regular reindeer migration camps, trade, boat-building or an Irish seasonal round. At Derryvree, meanwhile, the archaeological evidence is environmental rather than human: plants, insects, water and sediment illuminate habitat, not households.

For 31,160 BCE, then, Ireland's history is chiefly an environmental history. A Fermanagh wetland accumulated moss-rich mud between episodes of glaciation. Open, treeless vegetation occupied at least some ice-free ground. In Cork, cold-adapted animals entered landscapes capable of sustaining them, while a single marked reindeer bone raises—but does not settle—the possibility of human presence. Later ice would bury, scour and fragment much of this world. The surviving evidence is sparse, local and sometimes contested, yet it is sufficient to replace the old image of an empty, motionless frozen island with a more accurate one: an unstable Irish landscape in which water, plants, animals and perhaps people briefly found room between advancing phases of ice.

Chapter 042 of 100

31159 BCE

Maguirebridge's Fading Wetlands^[42]



Modern calendar precision cannot be carried back to 31,159 BCE. No event, season, named person or community can be assigned to that numbered year in Ireland. It is best treated as a point within a broad Late Pleistocene interval, roughly 33,100 calendar years before AD 1950, during Marine Isotope Stage 3. Dates at this depth are expressed through radiocarbon measurements, calibration curves and geological sequences, each with uncertainty that may extend across centuries or longer. The evidence therefore illuminates changing landscapes and animal life, not an Irish annal for a particular year.

A Landscape Approaching Ice

Ireland was in the later part of the Midlandian glaciation, but this did not mean a single, static island buried continuously beneath one uniform ice sheet. Ice expanded and contracted repeatedly; climates shifted sharply; and local conditions differed between uplands, coasts, caves and lowland basins. Around the broad period represented by 31,159 BCE, the British–Irish Ice Sheet was building towards its later maximum, conventionally placed many millennia afterwards, around 28,000–20,000 calibrated years before present. Reconstructions of its earlier growth remain contested, especially in a landscape whose older deposits were repeatedly eroded, overridden or buried by later ice.

The cautious picture is of a cold, largely treeless country with open herb-rich ground, sedges, dwarf shrubs and patches of wetland wherever water could pond beyond or beneath ice margins. It was not a modern Ireland in winter. Sea level was lower, coastlines lay far beyond many present shores, and the outlines of the island and the Irish Sea world differed substantially from today. Yet lower sea level does

not by itself prove a walkable land bridge from Britain, still less a particular route used by people or animals. The changing shelves, channels, glaciers and seas made connections possible at some times and difficult at others.

Fermanagh preserves an important reminder that Ireland's Ice Age history was environmentally varied. Organic sediments at Derryvree, near Maguiresbridge, lay between glacial deposits and recorded freshwater conditions, mosses, aquatic plants and cold-adapted vegetation during an ice-free or ice-marginal interval. A conventional radiocarbon determination known as BIRM-166 was published at about 30,500 radiocarbon years BP, with a substantial uncertainty. Its calibrated calendar placement is broader and earlier than the raw radiocarbon figure suggests. It cannot date conditions precisely to 31,159 BCE, but it demonstrates why a simple story of uninterrupted Irish ice cover is inadequate.

The Evidence of Cave Fauna

The strongest direct Irish evidence for the wider period comes from caves, particularly Castlepook Cave—also called Mammoth Cave—near Doneraile in north County Cork. Excavations from the late nineteenth and early twentieth centuries produced a remarkable collection of animal remains. Reassessment and accelerator radiocarbon dating have shown that parts of the assemblage belong to the Middle Midlandian, or MIS 3, rather than to one single occupation or one short-lived ecological episode.

Its recorded fauna includes reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyena. This is powerful evidence for the kinds of animals that reached Ireland during cold-stage intervals. It also suggests an open and demanding mosaic of grazing country, rocky limestone terrain and sheltered cave spaces. But the list must not be converted into a single illustrated scene for one year. The animals were deposited over long spans of time; some entered caves through carnivore activity, natural death, water movement or collapse; and early excavators could not record stratigraphy to modern standards. Castlepook is a deep archive, not a frozen instant.

Spotted hyena is especially significant. The National Museum of Ireland describes Castlepook as the country's most important site for mammal remains from the last cold stage, and notes that hyenas and other mammals probably reached Ireland from Britain during the broad interval c.45,000–30,000 years ago. Hyenas could carry bones into dens and disturb deposits, making them both inhabitants of the landscape and agents in the formation of the archaeological record. Mammoth and reindeer remains indicate that large herbivores could use Irish landscapes before the last glacial maximum, but neither proves that every species was present at the same time or in the same locality.

The Reindeer Bone Question

One Castlepook find gives this era exceptional importance for human history: a reindeer femur reported as about 33,000 years old and bearing a deep mark interpreted by zooarchaeologist Ruth Carden as damage made by a sharp stone tool during butchery. County Cork heritage material has accordingly presented the specimen as possible evidence of Palaeolithic people handling reindeer around 31,000 BCE. If the interpretation is confirmed, it would be by far the earliest indication of human activity in Ireland.

Its significance requires equally firm restraint. The radiocarbon result dates the death of the animal's bone tissue within a statistical range; it does not independently date the surface mark, establish who made it, show where the animal was killed, or reveal how long anyone remained in Ireland. The femur came from an old collection rather than a newly excavated, intact living surface. No securely associated hearth,

stone-tool assemblage, dwelling, burial, human skeleton, or repeated occupation layer of comparable age has yet been recovered at Castlepook. Recent work has identified surviving fossil-bearing deposits, which makes further investigation valuable, but it has not turned the cave into a demonstrated settlement.

The most responsible conclusion is therefore limited but important: a brief Upper Palaeolithic human incursion into Ireland is possible in the broad period around this date. A small party might have encountered or processed a reindeer, whether hunted, scavenged or found already dead. Reindeer could in principle provide meat, fat, hide, sinew, antler and bone; none of those uses beyond possible carcass processing can be demonstrated from this specimen alone. Permanent occupation, continuous population and descent into later Irish communities remain unproven.

Society Beyond the Evidence

There is no recoverable political history for Ireland at this date. No chiefs, territories, assemblies, diplomacy, warfare, laws or ethnic names can responsibly be inferred. Nor is there Irish evidence for farming, herding, trade goods, monuments, ritual deposits, art, formal learning or a language. Calling any possible visitors “Irish” would be anachronistic in every cultural and political sense.

Elsewhere in north-west Europe, *Homo sapiens* communities of the Upper Palaeolithic possessed sophisticated stone technologies, clothing and social networks, and in some regions made ornaments and cave art. That wider evidence provides a context for what a hypothetical visiting group might have known. It cannot fill Ireland’s evidential silence with invented camps, leaders or ceremonies. The absence of such traces may partly reflect sparse occupation, later glacial destruction, inundated former coastlines and the survival bias favouring caves; nevertheless, absence is not proof of a particular activity.

Everyday life can be described only at the ecological level. Reindeer, hares and lemmings were adapted to exposed cold environments; predators and scavengers followed prey and carcasses; people, if present, would have needed mobility, warmth, food and reliable knowledge of dangerous terrain. Caves offered shelter to animals and occasionally to people, but also accumulated complex deposits. They should not automatically be imagined as human homes. A limestone chamber could instead be a hyena den, animal trap, seasonal refuge, drainage route and bone archive at different times.

Connections, Not Trade Routes

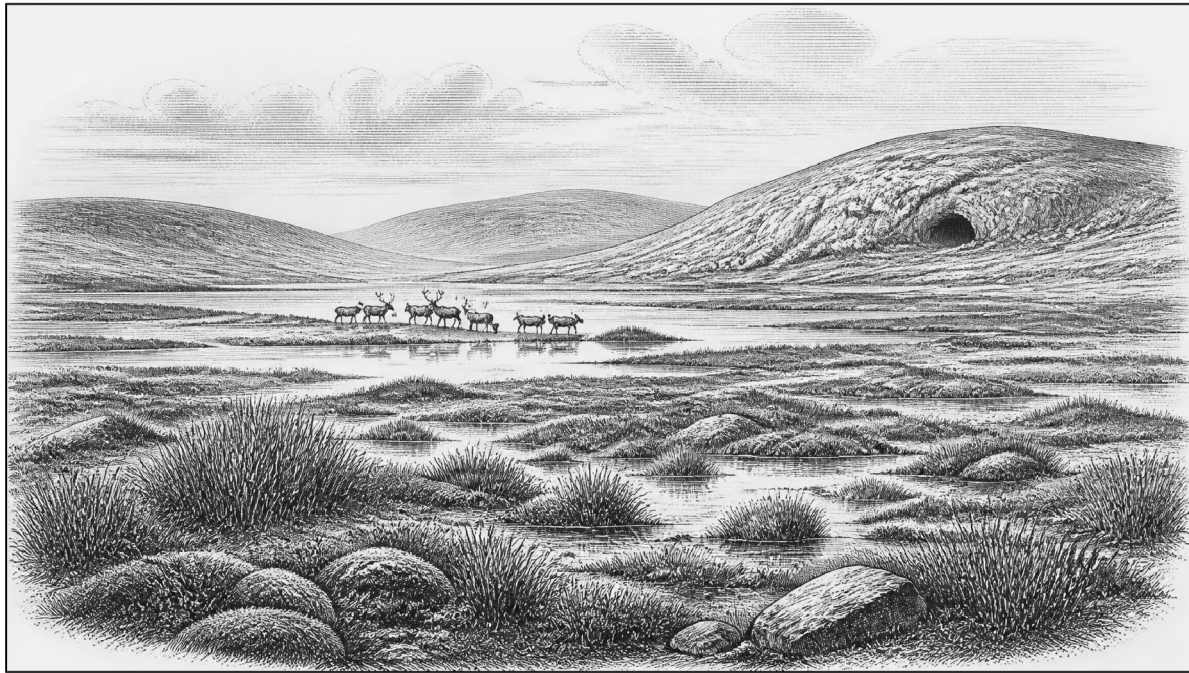
The economy visible in the evidence was ecological rather than commercial: movements of animals through changing habitats, the circulation of nutrients through grazing and predation, and perhaps the opportunistic use of a carcass by humans. There is no basis for identifying a trade network, a maritime crossing, or regular exchange between Ireland and Britain. What can be said is that Ireland was not environmentally isolated from the wider north-west European world. Faunal arrivals required changing geographical connections, while the development of ice and sea barriers could later close them.

Thus the principal development around 31,159 BCE was not a recorded human episode but a transformation in the conditions under which life could persist. Wetlands like those represented at Derryvree, and faunal assemblages such as Castlepook’s, preserve fragments of an Ireland on the threshold of more severe glaciation. The possible reindeer butchery mark remains an arresting clue, but it is not a foundation for a populated prehistoric nation. This is a history of sediments, bones and calibrated probabilities: sparse evidence, carefully read, of a cold and changing island at Europe’s western edge.

Chapter 043 of 100

31158 BCE

Rangifer at Mammoth Cave^[43]



The label 31,158 BCE does not identify a recoverable Irish “year” in the modern sense. No calendar, written testimony, settlement sequence or archaeological layer can be assigned to that precise point. In the conventional count from AD 1950 it falls roughly 33,100 calendar years before present, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), an unstable part of the last glacial cycle. The responsible scale is therefore centuries and millennia. What can be described is an Ireland that, during parts of this broad interval, supported cold-adapted animals and was not yet engulfed by the maximum extent of the last British–Irish Ice Sheet.

There is one reason this date has unusual interest. A reindeer femur from Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork, has been presented as approximately 33,000 years old and as bearing a deep incision consistent with cutting by a sharp stone tool. If that interpretation is sustained, it may be evidence that a person handled a reindeer carcass in Ireland at roughly this time. It is an important possibility, not a complete history of an Irish population.

A Date Without a Diary

Modern calendar notation gives a deceptive appearance of precision. Radiocarbon determinations measure the remaining carbon isotope in once-living material; they must then be calibrated against changing atmospheric radiocarbon levels. Their results are ranges, and archaeological deposits can be mixed, redeposited or disturbed. A date such as 31,158 BCE is thus best used as a convenient point within a chronological window, not as the date of a hunt, migration or political event.

At Derryvree near Maguiresbridge, County Fermanagh, roadworks in 1969 exposed organic-rich freshwater silts and sands between two deposits of glacial till. The original radiocarbon result from the organic material, BIRM-166, was 30,500 radiocarbon years BP, with a substantial error range. The

sediments have long been important because they show that an ice-free interval occurred between advances of glacier ice. Their pollen and plant macrofossils describe a treeless, wet, cold landscape rather than woodland. They cannot, however, be converted into a diary entry for 31,158 BCE, nor should they be treated as a complete picture of every Irish region at once.

Crag Cave in County Kerry provides a different kind of evidence. Uranium-series dating of broken and reworked cave calcite indicates episodes of speleothem growth during MIS 3. Since dripstone needs water moving through unfrozen ground and karst, its formation points to intervals less hostile to infiltration than a wholly frozen landscape. It does not mean that Ireland was warm, heavily wooded or continuously habitable; rather, it confirms climatic fluctuation within a generally cold age.

Before the Ice Sheet Maximum

Ireland was approaching, but had not yet reached, the last glacial maximum. The later British–Irish Ice Sheet attained its greatest known extent around 27,000 calendar years ago, with major ice retreat following thereafter. Around the broad time represented by 31,158 BCE, the island’s environments changed sharply as temperature, snowfall, permafrost and sea level responded to rapid North Atlantic climatic shifts. Ice may have occupied some upland or northern sectors at particular moments, while other areas remained open country. The surviving record is too fragmented to map an annual ice margin.

The Derryvree evidence is especially evocative: a freshwater, moss-rich wetland or muskeg developed in a depression later overridden or bordered by ice. Plants represented in the deposit include cold-tolerant mosses, sedges and aquatic species such as bogbean and water-milfoil, while herb pollen and dwarf-shrub indicators point to open ground. Such assemblages suggest patches of shallow water, saturated soil and low vegetation, not a blanket of forest. Seasonal thaw would have created muddy margins and standing water, while winter conditions could be severe.

That landscape should not be imagined as uniform tundra from Cork to Donegal. Ireland’s relief, limestone caves, river valleys, coasts and local snow accumulation created varied habitats. Nevertheless, the evidence favours a mostly treeless mosaic of herb-rich ground, wet hollows and exposed mineral soils in the better documented cold-stage settings. Lower global sea level altered the surrounding shelves and shorelines. Yet the exact configuration of land and sea between Ireland and Britain, and the route by which animals or any people entered, remain matters for reconstruction, not established facts for this date.

Castlepook’s Animal Archive

Castlepook Cave is the principal Irish archive for mammals living before the last glacial maximum. Excavations undertaken mainly in the early twentieth century recovered a very large, complex collection. It includes remains attributed to woolly mammoth, giant deer, reindeer, brown bear, wolf, fox, Arctic fox, mountain hare, Norwegian and collared lemmings, and spotted hyena. Direct dates from individual specimens and the association of bones with different deposits show that this is not a single momentary fauna. The cave accumulated material across a long period, through animal activity, natural deaths, water movement, sediment transport and excavation practices that predate modern recording standards.

Even with those cautions, the assemblage establishes an important regional fact: southern Ireland was reached, at intervals, by a broad cold-stage fauna. Reindeer and lemmings fit open, cold environments; mammoth and giant deer indicate that large herbivores could occupy or traverse parts of the island; wolves and hyenas reveal a predator and scavenger guild rather than an empty wilderness. A cave may

exaggerate predators, because denning and scavenging animals bring bones into sheltered places, but it is still powerful evidence that Irish ecosystems were connected to wider north-west European faunal movements.

The spotted hyena is particularly striking. Castlepook is Ireland's key locality for the species, and its bones and coprolites suggest that the cave was used within a carnivore landscape. Hyenas were not merely exotic visitors in a museum display: their presence helps explain why bone assemblages need taphonomic scrutiny. Tooth marks, breakage, trampling, water abrasion and human tool marks can all alter bone surfaces. Distinguishing them is central to the interpretation of the reindeer femur.

The Reindeer Femur Question

The marked reindeer bone is the closest evidence to human action currently relevant to this date. Its reported cut marks have been interpreted as fresh-bone butchery with a lithic edge. That conclusion, if confirmed, would push possible human activity in Ireland far earlier than the well-established post-glacial hunter-gatherer record. It would also place Ireland within the far western margins of Upper Palaeolithic movement at a time when *Homo sapiens* were widespread elsewhere in Europe.

But the limits are as important as the promise. The femur was recovered from an old cave collection, not from a newly excavated occupation floor with associated hearth, stone tools, food debris and securely recorded stratigraphy. No contemporary dwelling, burial, human remains or lithic assemblage has yet been recovered from Castlepook. Nor can one modified bone demonstrate whether visitors stayed for hours, days or seasons; whether they travelled as a family group, a hunting party or something else; or whether they returned. Current fieldwork at Castlepook is therefore rightly seeking undisturbed deposits, charcoal, lithics and further modified bone.

It is reasonable to say that reindeer meat, marrow, hide, sinew and antler would have been valuable to mobile foragers if people were present. It is not reasonable to turn that general possibility into a detailed Irish economy. There is no evidence here for farming, herding, long-distance trade networks, monuments, permanent villages, named communities or a language. The cave offers a possible trace of carcass processing, not proof of a settled society.

Society Beyond Recovery

Political affairs, diplomacy and organised conflict cannot be reconstructed for Ireland around this point. There are no chiefs, territories, alliances, forts or weapons assemblages known from the island that can responsibly be tied to 31,158 BCE. Likewise, religion and learning leave no identifiable Irish evidence of ritual places, burial practice, figurative art, oral tradition or teaching. It would be misleading to supply them from later Irish mythology or from famous Upper Palaeolithic sites elsewhere in Europe.

Comparative archaeology does offer a carefully limited frame. Human groups in Upper Palaeolithic Europe generally lived by hunting, gathering and extensive seasonal movement, relying on detailed environmental knowledge and social cooperation. Should the Castlepook cut-mark interpretation prove correct, any human presence in Ireland was likely small-scale and intermittent rather than the beginning of demonstrable continuous occupation. That is an inference from the scarcity and nature of the evidence, not a direct observation of a camp.

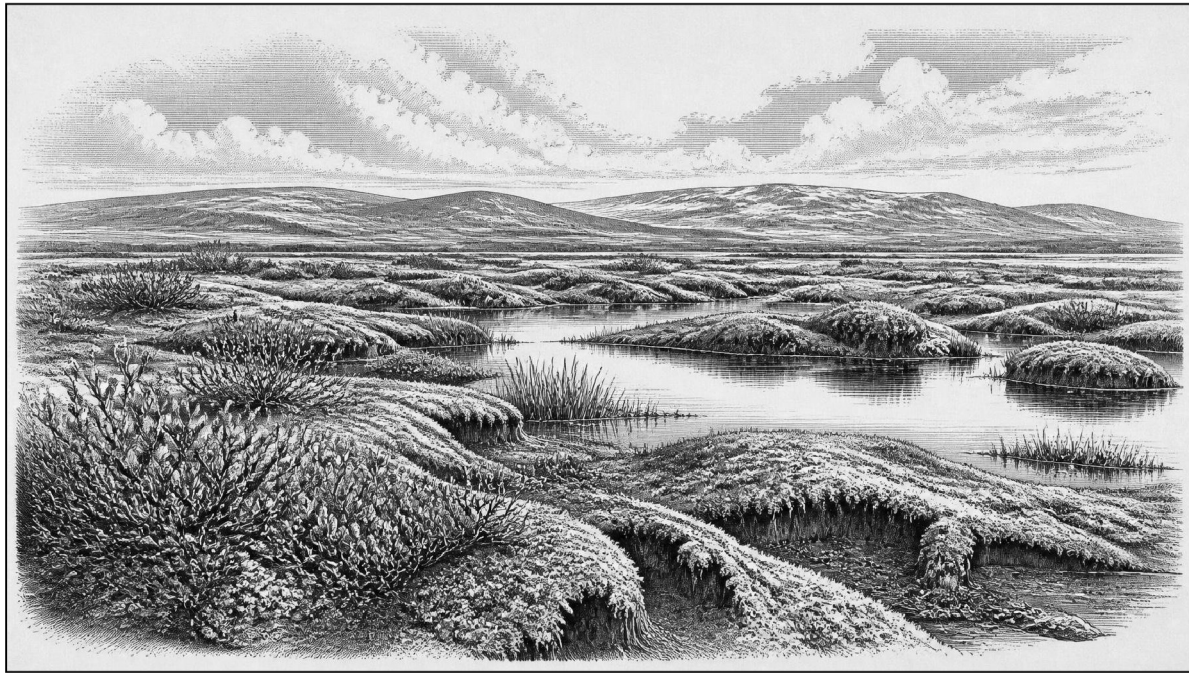
The most consequential development around 31,158 BCE is therefore neither a battle nor a ruler's accession. It is the survival of clues: a wetland sealed beneath glacial sediments in Fermanagh, calcite in a Kerry cave, and a reindeer bone from north Cork that may preserve a human gesture. Together they show

a changing, sometimes habitable Ice Age Ireland at the edge of Europe. They also demonstrate why prehistory requires restraint. The evidence makes the island's deep past richer than an empty interval, but it does not yet make it a story of continuous settlement.

Chapter 044 of 100

31157 BCE

The Maguiresbridge Silt Bed^[44]



31,157 BCE is a modern chronological label, not a recoverable year in Irish prehistory. It corresponds to roughly 33,106 years before the conventional radiocarbon baseline of 1950, but neither archaeology nor palaeoenvironmental science can identify an event, a person or a season in Ireland at that annual resolution. The responsible approach is to place this notional date within a wider Late Pleistocene interval, in Marine Isotope Stage 3, when climates in the North Atlantic region changed sharply and repeatedly. The most useful Irish evidence comes not from settlements or written records, but from buried sediments, fossil plants, insects, animal bones and cave deposits.

That evidence shows an Ireland very different from the later island of farms, monuments and kingdoms. Yet it does not permit a single, uniform picture for every region. Around this broad period, parts of the island could be ice-free while glaciers were expanding elsewhere; conditions also shifted over centuries and millennia. The later Last Glacial Maximum, when the Irish Ice Sheet became far more extensive, still lay ahead. Ireland at this horizon was therefore a landscape in transition: cold, exposed and ecologically demanding, but not simply a featureless land buried beneath ice.

A Date Range, Not a Dateline

The best direct environmental archive relevant to this date lies at Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and exposed organic silts and fine sands trapped between two thick layers of glacial till. The sediments produced the conventional radiocarbon determination Birm-166, about 30,500 radiocarbon years before present, with a substantial uncertainty. Using modern calibration, scholarship has placed this evidence broadly within approximately 36,900–31,700 calibrated years before present: in rough BCE terms, about 34,950–29,750 BCE.

That range includes 31,157 BCE, but it must not be treated as proof that the Derryvree wetland existed in precisely that named year. A radiocarbon result dates carbon in a sample, not a neatly bounded historical episode; calibration converts it into a probability range rather than a point on a modern calendar. The fact that organic sediment survived beneath later glacial deposits is itself important. It demonstrates that this part of Fermanagh was ice-free during at least part of the interval represented by the deposit, before renewed ice movement built or reworked the drumlin above it.

Open Tundra and Freshwater Pools

The Derryvree silts preserve a small but unusually informative ecological record. Plant remains, pollen, mosses and insects were interpreted by the original investigators as evidence for an open, treeless tundra or muskeg landscape. Grasses, sedges, herbs, dwarf willow, juniper and cold-adapted aquatic plants indicate low vegetation rather than forest. Mosses and insect remains point to wet ground with standing or slow-moving freshwater, open pools and abundant plant matter. This was a periglacial environment: land exposed to persistent frost and severe winters, but not necessarily lying under glacier ice.

Such a reconstruction should be read locally. Derryvree records a particular lowland basin, not all Ireland. Nevertheless, it supplies a vivid corrective to the idea that the country was either wholly frozen or comfortably temperate. Its landscape probably combined waterlogged hollows, sedge beds, mossy ground, stony open surfaces and patches of low shrub. Summers may have allowed a brief burst of plant growth, while winters were harsh enough for repeated freezing of the ground. The exposed character of the vegetation also suggests that shelter and fuelwood would have been scarce.

Other Irish records reinforce the broader conclusion that the late Middle Midlandian was climatically unstable. Speleothems in Crag Cave, County Kerry, were deposited episodically during the last glacial period. Because cave calcite requires liquid water moving through the rock, these deposits offer evidence for intervals in which mean annual conditions locally rose above freezing. They do not describe daily weather at Derryvree, and they cannot be matched to a particular calendar year. Together with glacial and sedimentary evidence, however, they show that Irish environments responded to the rapid warmings and coolings that affected the North Atlantic world.

Animals at the Edge of Ice

County Cork provides the principal Irish faunal evidence for this broad period. Castlepook Cave, near Doneraile and sometimes called Mammoth Cave, yielded remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, hare, lemmings and spotted hyaena. This is not a single living community frozen at one moment. Cave deposits accumulate over time; early excavations disturbed contexts; and later redating has shown that some older determinations needed revision. The careful conclusion is that a varied cold-stage fauna reached Ireland during Marine Isotope Stage 3, rather than that every listed animal shared one valley in 31,157 BCE.

Even so, the assemblage gives a strong impression of the ecological possibilities. Reindeer and lemmings suit open, cold country. Mammoth and giant deer evoke extensive grazing grounds, though their Irish remains are rare and chronologically dispersed. Carnivores such as hyaena, wolf and bear show that Ireland formed part of a wider north-west European zone in which large herbivores and predators could move through changing landscapes. A cave could have been a den, a place where animals died naturally, a trap for washed-in bones, or more than one of these over long periods. Its bones illuminate animal presence and ecological connection, not a settled human economy.

Lower sea levels exposed land now submerged around Ireland and altered coastlines profoundly. This may have made movement between Ireland, Britain and the continental shelf easier at some stages, whether across exposed ground, ice-connected terrain or short water crossings. The precise routes available around 33,000 years ago remain debated because ice extent, sea level and local topography changed together. It is safer to say that Ireland was less geographically isolated than it is today, while recognising that cold seas, ice margins and difficult terrain could still have been formidable barriers.

The Human Question at Castlepook

The possibility of human activity makes this period especially significant. A reindeer femur from Castlepook Cave has been reported as bearing a deep modification interpreted as a fresh-bone cut or chop made with a stone implement. Public discussion of the find associated the bone with an age of about 33,000 years. If that interpretation is sustained, it would indicate that one or more Upper Palaeolithic people processed a reindeer in Ireland during the broad period close to this article's notional date.

Yet the evidence must be kept in proportion. The bone is not a house, hearth, tool assemblage, burial, camp floor or stratified hunting site. Its date is the age of the animal bone, not a timestamp for the making of the mark. Nor can one modified bone establish whether people lived in Ireland permanently, made occasional expeditions, followed migrating game, or arrived only once. It does, however, challenge the older assumption that human presence in Ireland began only after the final retreat of the ice. Continued excavation and careful re-examination of surviving cave deposits are essential before large claims are made.

No Politics, No Proven Diplomacy

There is no evidence from Ireland around this horizon for political communities, leaders, territorial states, warfare, diplomacy, named peoples or institutions. Likewise, archaeology cannot responsibly identify religious practices, myths, language, artistic traditions, formal learning or social ranks. Absence of evidence does not mean that any people who briefly entered Ireland lacked beliefs, knowledge or social bonds. It means that the Irish record has not preserved material evidence capable of describing them.

The same caution applies to economy and trade. If people processed the Castlepook reindeer, they possessed at least the practical knowledge needed to use a sharp stone edge on fresh bone. Beyond that narrow inference, there is no securely dated evidence for regular hunting territories, exchange networks, boat travel, clothing manufacture or long-term provisioning in Ireland at this time. No field system, domestic animal, crop, mine, monument or durable settlement belongs to the period. The familiar structures of Irish history are tens of millennia away.

A Landscape Before Settlement

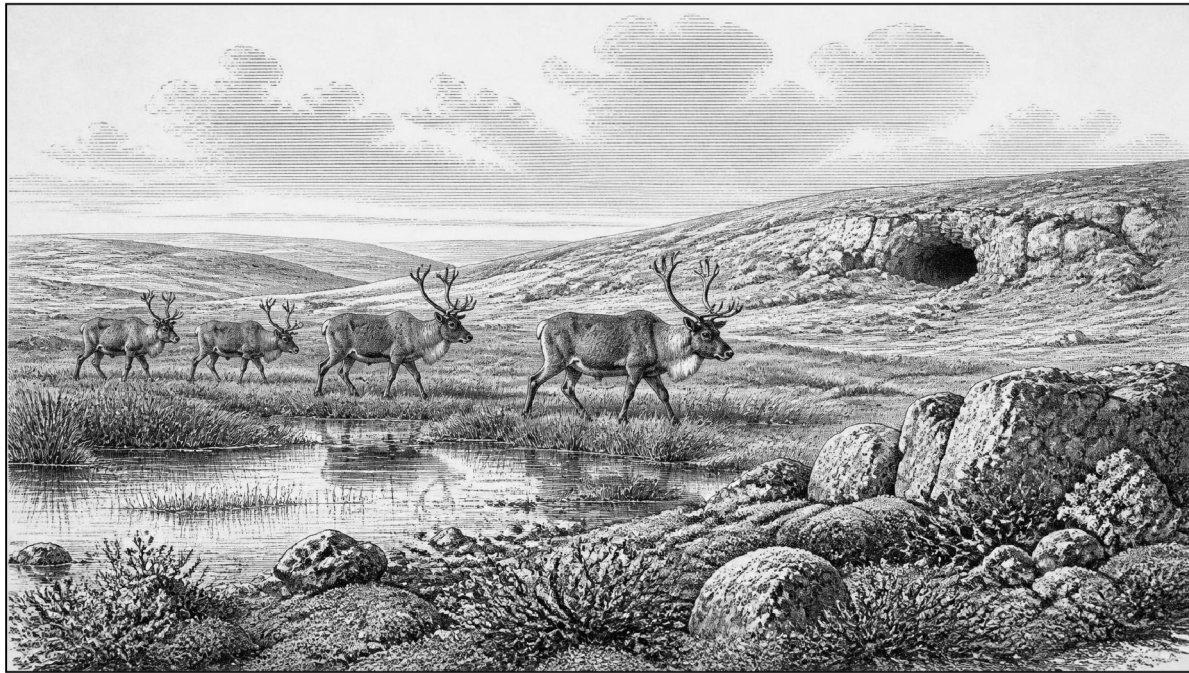
What can be said is both limited and important. During the broad interval that includes 31,157 BCE, Ireland contained environments capable of supporting cold-adapted plants and animals in at least some ice-free areas. Derryvree preserves freshwater tundra under later glacial deposits; Castlepook preserves traces of a richer Ice Age fauna; Crag Cave records wider climatic oscillations; and the expanding British-Irish Ice Sheet threatened to erase or bury much of what had existed before. Any human presence was, at most, fleeting in the evidence presently available.

This is not yet the history of an Irish population, much less of an Irish society. It is the deeper precondition for that history: a changing northern landscape, connected intermittently to wider worlds, occupied by animals and perhaps visited by people, then repeatedly transformed by ice. The Maguiresbridge silt bed matters because its fragile organic remains make that vanished landscape briefly legible.

Chapter 045 of 100

31156 BCE

The Doneraile Reindeer Incision^[45]



“31,156 BCE” is a modern numerical label, not a year that anyone then living in Ireland could have named or recorded. No written calendar, settlement sequence or archaeological layer can be fixed to that single year. In conventional archaeological terms, it falls at roughly 33,100 calibrated years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3, a climatically unstable stretch of the last Ice Age. The responsible account of Ireland at this point is therefore one of dated ranges, buried sediments, animal remains and carefully limited inference—not a chronicle of events.

An Island Before Full Glaciation

The best current reconstructions suggest that much of Ireland was not yet buried beneath the expanded ice sheet that would dominate the island during the Last Glacial Maximum. That maximum came later, broadly between about 26,500 and 19,000 years ago, although the exact advance and retreat of ice varied by region. For the time represented by 31,156 BCE, the evidence points instead to a cold, exposed and changing landscape in which ice, water and permafrost-like ground conditions could all be important without making the whole island uniformly glaciated.

North-central Ireland provides a particularly valuable clue. At Derryvree, near Maguiresbridge in County Fermanagh, road works exposed organic-rich silts and fine sands lying between two tills: deposits left by glacier ice. The freshwater sediments were laid down during an ice-free interval and later overridden or sealed by renewed glaciation. A radiocarbon determination from the sequence, when calibrated, spans approximately 36,900–31,700 calibrated years before present. That broad range encompasses the modern date used here, but it does not date a particular season, generation or occurrence in 31,156 BCE. It establishes that an ice-free freshwater environment existed in this part of Ireland during the wider interval.

Other sites reinforce the point that Ireland's last glacial history was episodic rather than a single uninterrupted freeze. Deposits at Greenagho in Fermanagh and Aghnadarragh beside Lough Neagh preserve sediments formed between phases of ice advance. Geological evidence from southern and offshore Ireland shows that the major late-glacial expansion was still developing over many millennia. Regional conditions need not have been identical: a wet basin in Fermanagh, an upland slope in Munster and a cave in north Cork could each have experienced the same broad cold stage differently.

Wet Tundra, Open Ground

Derryvree is important because its fossils turn a geological interval into an ecological setting. Pollen, plant macrofossils, mosses and insect remains indicate sparse, predominantly open vegetation rather than continuous woodland. The landscape is commonly interpreted as tundra or tundra-like muskeg: damp, sedgy and mossy ground around shallow freshwater, with herbs and low shrubs able to survive short growing seasons, frost disturbance and severe winters. Such terms describe a reconstructed habitat, not a photograph of the whole island. The surviving sediments are local records, and the plants represented in them grew through an interval rather than on one precisely recoverable day.

The implication is nevertheless substantial. Parts of Ireland contained liquid freshwater, vegetation and animal forage during a period often casually imagined as a featureless white wilderness. There may have been marshes, pools, stream margins and better-drained open patches within a broader cold environment. Snow cover, frozen soils, seasonal flooding and wind exposure would have shaped where plants and animals could persist. This was not the later green, wooded Ireland familiar from Holocene archaeology; nor was it necessarily barren. It was a northern landscape with productivity concentrated in particular seasons and places.

Castlepook's Faunal World

The clearest southern Irish evidence comes from Castlepook Cave near Doneraile, County Cork. Excavations there in the early twentieth century recovered an extraordinary collection of Late Pleistocene animal remains. Later radiocarbon work, including re-dating using improved bone-treatment methods, has shown that some of the cave's fauna belongs to Marine Isotope Stage 3, much earlier than had once been thought. The collection includes reindeer, woolly mammoth, giant deer, brown bear, wolf, hare, fox, lemmings and spotted hyaena. These species were not necessarily contemporaries: cave deposits accumulated, were disturbed, and include material from different episodes. Yet together they demonstrate that Ice Age Ireland could, at intervals, support or receive a diverse cold-country fauna.

Reindeer are particularly evocative because they suit open, seasonal country and may have moved across wide territories. Mammoth, giant deer and hyaena point to connections with the wider north-west European mammal world, but fossils alone cannot reveal population size, migration routes or whether animals crossed a dry land corridor at this exact time. Lower global sea levels exposed more of the surrounding continental shelf than exists today, while changing ice margins, rivers and coastlines made routes complex. Ecological connection is securely suggested; a simple, permanent land bridge is not.

A Single Incision, A Large Question

The date is especially relevant because of a reindeer femur from Castlepook. Public accounts and local heritage interpretation have presented the bone as dating to about 31,000 BC and carrying a deep mark identified by palaeozoologist Ruth Carden as a stone-tool incision made while the animal was butchered. If that interpretation is confirmed, it would be striking evidence that people handled reindeer in Ireland during the Upper Palaeolithic, far earlier than the island's long-established Mesolithic record.

Its limits are as important as its promise. The femur is not a house floor, hearth or tool kit. No securely associated stone tools, butchered assemblage, dwelling, grave, ornament, cave art or stratified occupation surface has yet been recovered from Castlepook for this phase. The cave's early excavation history and its complex deposits make context difficult. A radiocarbon result dates the animal bone; determining whether a surface mark was produced by a human tool, carnivore activity, sediment movement or another process requires separate microscopic and taphonomic assessment. The prudent conclusion is that Castlepook offers a serious and potentially transformative indication of human activity, not proof of an established Irish population in this particular year.

Society Beyond the Evidence

There is no evidence from Ireland around this date for political communities, rulers, warfare, diplomacy, territorial boundaries or institutions. There is likewise no Irish evidence from which to reconstruct language, religion, kinship, formal learning, artistic traditions or trade. It would be tempting to borrow the richly documented Upper Palaeolithic cultures of continental Europe and Britain—mobile hunting groups, elaborate stone technologies, ornaments and images—and assign them to Ireland. That would turn regional analogy into fact. At most, a genuine humanly made cut on the Castlepook femur would imply practical knowledge of a sharp stone implement and the processing of an animal carcass.

Nor can “economy” be used in its later sense. If people were present, their survival would have depended on mobility, seasonal judgement and access to animal and plant resources in a severe environment. Reindeer flesh, hide, sinew, bone and antler would have been useful resources to Upper Palaeolithic hunters elsewhere, but no Irish assemblage demonstrates how such materials were used here. The safest description is of possible short-term incursions into a landscape inhabited by large herbivores and predators, rather than a permanent settlement or trading society.

What Can Be Said Responsibly

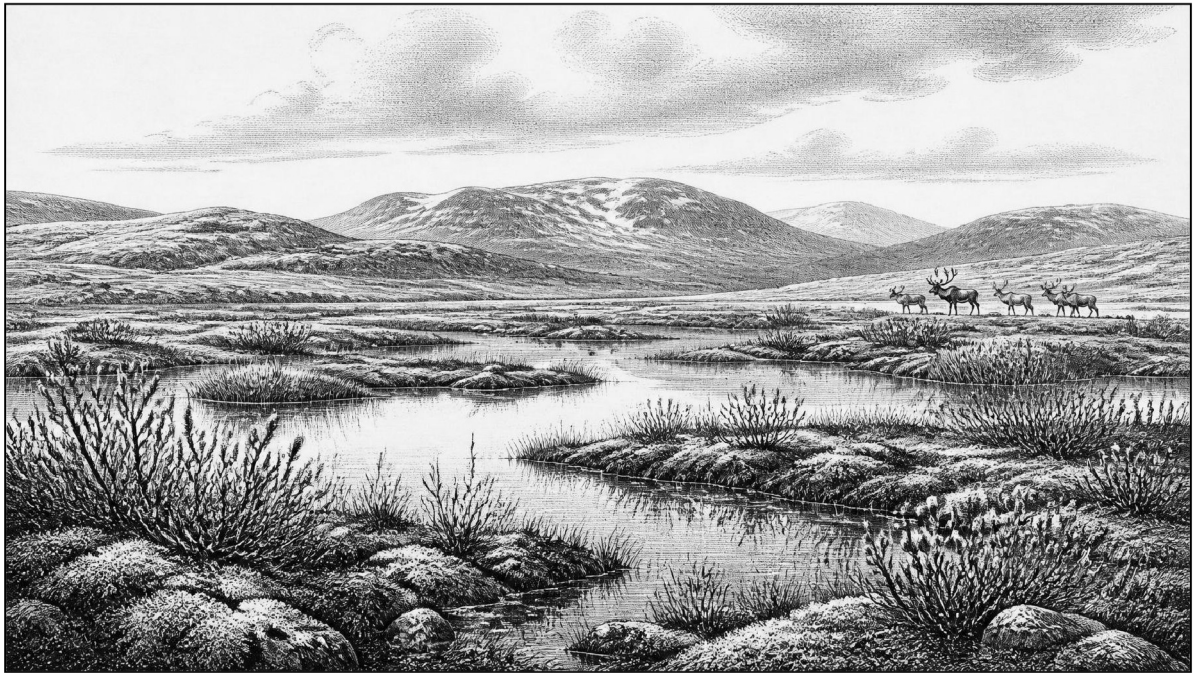
Ireland around the notional date of 31,156 BCE was part of a dynamic Ice Age zone, not yet the fully ice-covered island of the later glacial maximum. Freshwater deposits beneath Fermanagh tills preserve evidence of cold, open wetland environments during a date range that includes this point. Caves in north Cork preserve the remains of mammals adapted to, or capable of occupying, open northern landscapes. The Castlepook reindeer femur raises the possibility that people also reached Ireland during this phase.

That is already a remarkable historical picture, even without invented chiefs, battles or campsites. The material record shows an Ireland repeatedly reshaped by climatic change, linked ecologically to neighbouring regions and capable of sustaining a distinctive Ice Age fauna. It also shows why certainty must remain limited. Each new radiocarbon measurement, re-excavation and microscopic study has the potential to alter the story. For now, the most honest history of this numbered year is a landscape of cold wetlands, roaming animals, advancing future ice—and one contested cut on a reindeer bone.

Chapter 046 of 100

31155 BCE

Castlepook at the Ice Threshold ^[46]



31,155 BCE is a modern label placed on a stretch of deep prehistory, not a year anyone in Ireland could have named, recorded or experienced as a date. There is no annual chronicle for this period, no king, community or event that can responsibly be assigned to that precise year. In radiocarbon convention, the label falls around 33,100 calendar years before present (where “present” is AD 1950), but that conversion must not be mistaken for calendar-year precision. At this depth in time, even well-dated evidence normally produces ranges of centuries or millennia. The most useful question is therefore not what happened in Ireland in one imagined year, but what the archaeological and environmental record can securely say about Ireland around the later part of Marine Isotope Stage 3, before the Last Glacial Maximum.

A Date Within a Range

The closest important Irish chronological anchor is not a settlement but a buried wetland at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks exposed organic freshwater silts and fine sands enclosed between two layers of glacial till in a drumlin. Organic material from this deposit returned a conventional radiocarbon age of about 30,500 radiocarbon years BP, with a large uncertainty; calibration has been expressed as a broad range of roughly 36,900–31,700 calendar years BP. That range overlaps the notional date represented by 31,155 BCE. It does not mean that the Derryvree bed was laid down in that exact year. Rather, it shows that north-central Ireland contained an ice-free freshwater environment during part of this long interval before a later advance of glacier ice sealed it beneath till.

Such a distinction matters. Radiocarbon ages are measurements with error margins, and their conversion into calendar ages depends on calibration curves that are themselves refined as new evidence becomes available. Beyond the reach of securely dated tree rings, calibration relies on combined evidence

from floating tree-ring sequences, lake sediments, marine sediments, cave deposits and corals. A numbered BCE year is thus useful as an index entry, but it is not a licence to make precise claims about weather, migration or human action on a particular day or season.

A Patchwork Before Maximum Glaciation

Ireland was moving towards the great expansion of the last British–Irish Ice Sheet, but it was not yet uniformly the ice-covered land of the later Last Glacial Maximum. The island's glacial history was regionally varied and remains actively reconstructed from landforms, sediments, offshore cores and numerical modelling. The Derryvree organic bed, alongside comparable evidence at Greenagho in Fermanagh and evidence for open water off the west coast, demonstrates that simple pictures of an Ireland continuously buried beneath ice are wrong.

At about this time, conditions were cold, open and unstable by modern standards. The vegetation indicated by Derryvree's plant remains and pollen was not woodland. It included mosses and herbaceous tundra plants, with species capable of living in wet, exposed, periglacial ground. Sedges, dwarf willow, mountain-avens, bogbean and aquatic plants such as water-milfoil have been identified in the wider Fermanagh inter-till record. The combination suggests shallow freshwater, marshy margins and open ground within a cold landscape, rather than a single unchanging plain of snow. It also indicates summer thaw, liquid water and enough growing season for specialised plants, even while prolonged frost and sparse vegetation constrained life.

These deposits illuminate an environmental window, not the whole island at once. A wet basin in Fermanagh cannot tell us the precise state of a limestone valley in Cork, a mountain in Wicklow or the Irish Sea floor. Nor can plant fossils alone supply annual temperatures. They do, however, establish a central fact: parts of Ireland could sustain freshwater ecosystems and tundra vegetation before renewed glaciation overran and preserved them. Later ice was an agent of destruction as well as preservation, eroding or burying older landscapes and greatly limiting what survives for archaeologists to find.

North Cork's Cave Fauna

For animals, the richest directly relevant archive lies far to the south-west at Castlepook Cave—also called Mammoth Cave or Doneraile Cave—near Doneraile in north County Cork. Early twentieth-century digging recovered a large but complicated collection of Pleistocene bones from its passages. The assemblage has included reindeer, giant deer, red deer, brown bear, wolf, Arctic fox, mountain hare, lemmings, woolly mammoth and spotted hyaena. It presents a striking image of Ireland as part of a wider north-west European cold-stage ecosystem, visited or occupied at different times by grazing animals, predators and scavengers.

That image must be handled cautiously. A cave bone is evidence that an animal, or an animal's remains, reached the cave; it is not automatically evidence that all species lived together, or even in the same millennium. Castlepook's deposits were excavated long ago, were affected by complex cave processes, and include material from more than one phase. The Irish Quaternary Fauna Project showed why direct dating was essential, while later ultrafiltration dating demonstrated that some 1990s radiocarbon determinations from Castlepook were substantially too young. Re-dating pushed some specimens back by approximately 5,000 to 12,000 radiocarbon years and strengthened the conclusion that elements of the fauna belonged to Marine Isotope Stage 3.

For a point around 33,100 calendar years BP, Castlepook therefore supports a broad, not a year-specific, conclusion: cold-adapted and open-country mammals reached Ireland during the pre-maximum phase of the last glaciation. Reindeer are especially evocative, but they should not be used to turn all of Ireland into a uniform “reindeer steppe”. Their remains, and those of Arctic fox and lemmings, show northern ecological connections; giant deer, bears and hyaenas show that the faunal world was varied and changed through time. Carnivores could drag carcass parts into caves, while water, collapse and excavation could mix them further.

The Human Question

A reindeer femur from Castlepook has attracted particular attention because one mark on it has been interpreted as a cut or chop made by a sharp stone tool while the bone was fresh. Public heritage accounts have associated the object broadly with about 31,000 BC, raising the possibility that people processed a reindeer in Ireland far earlier than the long-accepted post-glacial settlement of the island. If that interpretation is sustained, it would be extremely important: it would indicate a brief Upper Palaeolithic human presence or visit during a cold-stage interval when Ireland was connected ecologically with Britain and continental Europe.

But the evidence does not yet justify a detailed story of hunters, a camp or a migration route. No securely associated stone-tool assemblage, hearth, dwelling surface, burial or human bone of comparable age has been recovered at Castlepook. The femur derives from an old collection rather than a modern excavation of a sealed occupation layer. A single possible butchery mark can support the proposition that human handling is plausible; it cannot demonstrate that the animal was hunted locally, that people lived in the cave, or that there was a permanent population. Recent excavation has sought to improve the cave’s archaeological context, but Castlepook remains a research problem rather than an established Palaeolithic settlement.

This is also why political affairs, diplomacy and warfare cannot responsibly be reconstructed for Ireland around this date. There is no evidence for polities, territorial institutions, named communities, formal leadership or organised conflict. If humans did enter Ireland, they may have belonged to small, mobile hunter-gatherer groups whose social relationships left no identifiable record here. That is an inference from the wider Upper Palaeolithic world, not a demonstrated fact about an Irish group in 31,155 BCE.

Livelihood Without an Economy

Neither farming nor trade can be documented. Fields, livestock, pottery, metal, monuments and settled villages all belong to immensely later Irish prehistory. The only possible economic activity near this date is the processing of animal carcasses suggested by the Castlepook femur, and even that remains contingent on the cut-mark interpretation. Reindeer, giant deer and other herbivores could have been resources for meat, hides, sinew, bone and antler if people were present. Yet no Irish artefact assemblage demonstrates those practices for this interval.

Likewise, there is no Irish evidence for shrines, graves, art, formal learning or religion. Caves can easily encourage imaginative stories, but Castlepook’s known significance is palaeontological and geological. Its animal assemblage reveals a changing ecosystem; it does not establish ritual use. Culture is visible here chiefly in the discipline of modern research: excavation records, faunal identification, taphonomic study, radiocarbon measurement and repeated reassessment of old collections.

An Island in Transition

The principal development around this notional date was environmental transition. Ireland was not yet at the last ice sheet's maximum extent, which came thousands of years later, but the climatic trajectory was towards more extensive glaciation. Recent British–Irish Ice Sheet reconstructions begin at 31,000 years BP—later than the BCE label used here—and model rapidly accumulating ice, including a northern Irish centre, after that point. Their value is not to provide a photograph of Ireland in 31,155 BCE, but to show how quickly the setting recorded at Derryvree could be overtaken by expanding ice.

Thus the responsible portrait is neither of a blank, lifeless Ireland nor of a populated prehistoric nation. It is of an intermittently habitable, cold and environmentally diverse island on Europe's north-western edge: wet tundra basins in Fermanagh; cave corridors in north Cork accumulating the remains of animals; and changing sea, ice and land routes that permitted some species to arrive while making survival precarious. The named year is unknowable. The evidence instead preserves a longer story of freshwater life, open-country fauna and an approaching ice surge.

Chapter 047 of 100

31154 BCE

Derryvree's Waterlogged Witness^[47]



“31,154 BCE” is a modern calendar label, not a year that can be recovered with annual precision from Ireland’s Late Pleistocene record. No written chronology, settlement sequence or archaeological layer can be assigned to that exact year. In conventional archaeological terms, the date falls roughly 33,100 calendar years before AD 1950, within Marine Isotope Stage 3, a long and climatically volatile part of the last Ice Age. The most responsible account of Ireland at this point is therefore not a narrative of named people or events, but a reconstruction from caves, buried wetland sediments, fossil bones, pollen, insects and the landforms left by advancing ice.

A Date Within a Broad Window

The most informative evidence close to this notional date comes from Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and exposed an unusual sequence: organic freshwater silts and fine sands enclosed between two thick sheets of glacial till. The lower till recorded an earlier episode of ice deposition; the organic bed recorded a period in which this particular locality was free of overriding glacier ice; the upper till showed that ice later returned. The deposit produced the conventional radiocarbon determination Birm-166, 30,500 radiocarbon years before present, with a substantial published uncertainty of +1,170 and –1,030 years.

Radiocarbon years are not calendar years. When calibrated, the Derryvree result has been placed broadly between about 36,900 and 31,700 calibrated years before present. The modern label 31,154 BCE lies within that wide range, but it cannot identify the beginning or end of the marsh, a particular season, or the life of a particular animal. The deposit is best understood as evidence for a span of time in the later

Middle Midlandian, rather than an annual diary. It is also local evidence: Derryvree demonstrates ice-free freshwater conditions near Maguiresbridge during the interval represented by its sediments; it does not prove that every part of Ireland was ice-free at once.

A Marsh in a Cold Landscape

Derryvree's organic bed offers a rare view of an Irish landscape that was cold, open and alive. Its plant and animal remains indicate tundra-like vegetation and a periglacial regime, meaning a climate shaped by severe freezing and thawing close to the margins of ice. Mosses, herb pollen, aquatic plants and insect remains point to a wet mosaic rather than a featureless frozen plain. There were shallow pools and waterlogged ground rich in plant matter, with mossy margins and low vegetation around them. The environment has been described as muskeg-like: a cold, wet peat-forming terrain, broken by standing water and patches of sedge or herb-rich ground.

Some of the fossils are especially useful because they have narrow ecological requirements. Finds associated with the Derryvree deposit include mountain-avens, bogbean and alpine clubmoss, plants that support the reconstruction of open, cold-climate habitats. Their presence does not mean that the whole island resembled a modern Arctic upland, nor that every plant grew together in one square metre. Fossil assemblages accumulate over time and across small habitats. Nevertheless, the combined evidence strongly supports sparse tree cover, exposed ground, freshwater pools and vegetation adapted to short growing seasons. The few tree pollen grains reported in the sequence are not secure proof of woodland: such grains can travel far on the wind or be reworked from older sediments.

Before the Last Ice Maximum

This was an Ice Age landscape, but not yet the best-established maximum of the last Irish ice sheet. Later in the glacial cycle, ice expanded across much of Ireland and onto the surrounding continental shelf. Reconstructions differ in detail because ice margins were dynamic and dating evidence is uneven, but major offshore advances occurred considerably later than the Derryvree freshwater interval, with shelf-edge glaciation in western sectors around 27,000 years ago. At roughly 33,100 calibrated years before present, Ireland was approaching a more extensive glacial phase, not uniformly buried beneath the final maximum ice cover.

The sequence at Derryvree makes this regional change tangible. It preserves an interval of open water and vegetation between episodes of glacial deposition, then records the loss of that environment beneath renewed ice. Farther west, cave formations at Crag Cave in County Kerry preserve another kind of climatic evidence. Speleothems grow only when liquid water can percolate through rock, and their interrupted growth during the last glacial cycle shows that milder interstadial conditions were episodic rather than permanent. Ireland's climate at this scale did not move steadily from mild to cold. It altered abruptly and repeatedly, with local landscapes responding to shifts in temperature, precipitation, snow cover and ice extent.

Animals at Castlepook

County Cork provides a complementary, though differently complicated, archive. Castlepook Cave, also known as Mammoth Cave or Doneraile Cave, near Doneraile contains Ireland's richest known pre-Last Glacial Maximum vertebrate assemblage. Excavations in the early twentieth century recovered more

than 2,000 bones from cave deposits disturbed and accumulated over long periods. The recorded fauna includes woolly mammoth, giant deer, reindeer, brown bear, spotted hyaena, wolf, Arctic fox and both collared and Norwegian lemmings. Such a list establishes that parts of Ireland could support, or at least receive, a diverse cold-stage fauna during Marine Isotope Stage 3.

It does not produce a simple scene from one day in 31,154 BCE. Cave deposits can mix material carried in by predators, water, scavengers and later disturbance; bones of different ages may lie close together. A mammoth bone from Castlepook once returned a conventional radiocarbon age of $33,400 \pm 1,200$ years before present, helping to place part of the assemblage broadly near this period. The fauna nevertheless illuminates real ecological relationships. Reindeer and giant deer required grazing or browsing country; lemmings are consistent with open cold habitats; large carnivores show that carcasses and prey formed part of a functioning food web. Spotted hyaenas may have brought bones into the cave, so the assemblage is not a direct inventory of animals killed at its entrance.

The Human Question

The most consequential, and most limited, evidence for people is a reindeer femur from Castlepook reported to bear a deep mark interpreted as a cut or chop made on fresh bone with a sharp stone implement. The bone has been publicised as dating to roughly 33,000 years ago. If that interpretation and dating relationship are sustained, it indicates that a human or small party processed a reindeer in Ireland during the Late Pleistocene, far earlier than the island's well-attested Mesolithic settlement. It would be evidence of activity, however, not of a village, a permanent population or a continuous line of descent to later inhabitants.

There are no securely contemporary houses, hearths, stone-tool assemblages, human burials or human skeletal remains from Ireland that permit a fuller account of those possible visitors. Nor can the femur identify whether people hunted the animal, encountered a carcass already killed by predators, or came from a group based elsewhere. Stone-tool marks are valuable evidence, but a single modified bone cannot reveal language, kinship, clothing, group size or the length of a stay. Later Upper Palaeolithic groups elsewhere in north-western Europe used stone, bone, wood, hides and animal sinew, but applying their practices wholesale to Ireland would be interpretation, not direct Irish evidence.

No Politics, No Trade Network

For that reason, it would be misleading to invent political affairs, warfare, diplomacy, trade routes or religious institutions for Ireland in this year. No chiefs, territories, alliances, shrines, graves or ceremonial monuments are known from the Irish record at this horizon. Predators competed for carcasses; that is ecology, not evidence of human conflict. Likewise, reindeer hide, meat, marrow and sinew would have been useful resources if people were present, but no Irish assemblage of this age demonstrates an economy, exchange system or regular hunting territory. Agriculture, livestock, pottery, metalworking and monumental building lay tens of millennia in the future.

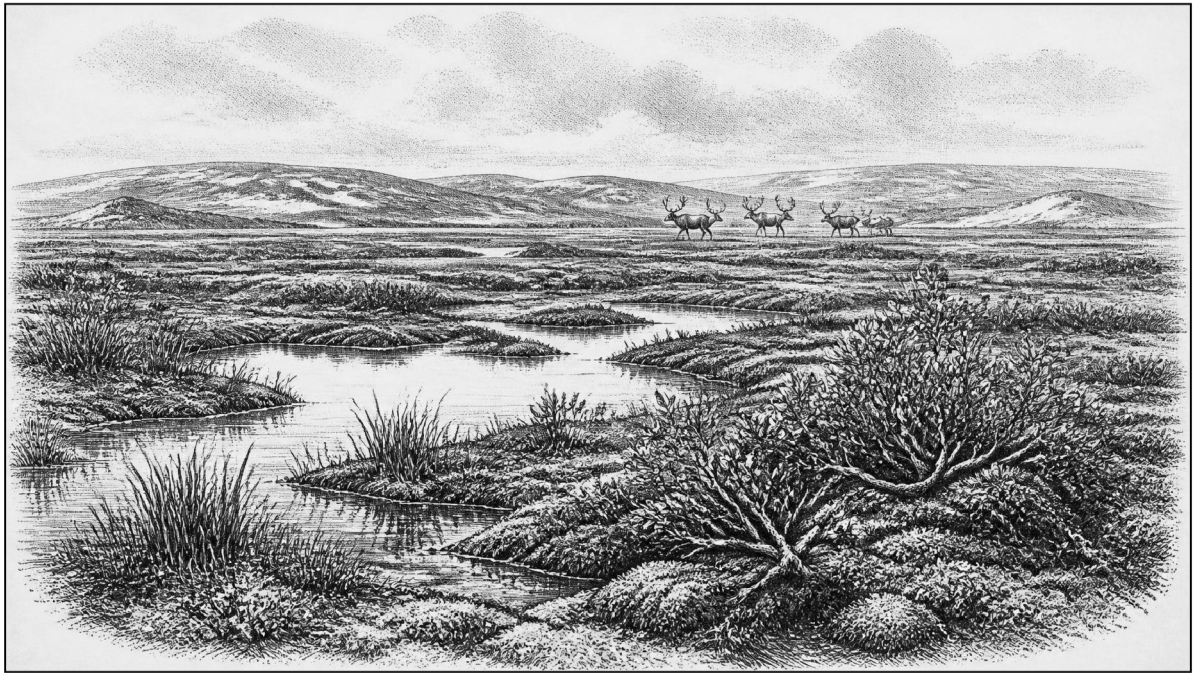
What can be said is both narrower and more remarkable. Around the broad period represented by 31,154 BCE, parts of Ireland were not an empty abstraction beneath unbroken ice. At Derryvree, freshwater pools, mosses and cold-adapted plants survived between glacial episodes. At Castlepook, a varied large-mammal fauna occupied or passed through southern Ireland's open country. A single marked

reindeer bone raises the possibility that humans entered this demanding world. The enduring lesson is one of caution: Ireland's earliest history is preserved not in a calendar of events, but in fragile fragments that reveal a changing island at the edge of ice.

Chapter 048 of 100

31153 BCE

BIRM-166's Buried Ecosystem^[48]



“31,153 BCE” is a useful modern label, but it is not a year that can be recovered from Ireland’s archaeological record. No written calendar, named community, political event or securely dated occupation can be assigned to this particular twelve-month span. At this depth in time, even radiocarbon determinations carry substantial uncertainty and must be calibrated into ranges rather than converted into apparent historical anniversaries. The responsible subject is therefore Ireland during the later part of Marine Isotope Stage 3 (MIS 3), within the Midlandian cold stage of the Late Pleistocene.

The strongest Irish evidence relevant to this date is environmental, not biographical or political. It comes from Derryvree townland near Maguiresbridge in County Fermanagh, where roadworks in 1969 exposed organic freshwater sediments caught between two thick layers of glacial till within a drumlin. The organic horizon received the laboratory designation BIRM-166. A conventional radiocarbon measurement of 30,500 +1,170/-1,030 years BP was obtained from it. Under modern calibration, that result belongs broadly within a very wide interval of roughly 36,900–31,700 calibrated years BP, or approximately 34,950–29,750 BCE. The requested date falls inside that range, but cannot be located in a particular season, sediment layer or episode of life.

A Landscape Between Glaciers

Derryvree’s sequence gives a clear relative order of events. A glacier first deposited the lower till: unsorted clay, stones and debris pressed down beneath moving ice. In an ensuing ice-free interval, water, fine sand, silt and organic remains accumulated in a freshwater setting. A later glacial advance then laid

down the upper till and sealed the earlier wetland. This does not mean that the whole of Ireland was ice-free at one moment, or that the country experienced a single simple freeze and thaw. It does show that this part of Fermanagh had passed through a cold but non-glacial phase before renewed ice reached it.

That distinction matters. Ireland around this broad period should not be imagined as either a uniformly white ice sheet or a familiar green island. The evidence instead indicates a geographically variable and changing world: ice in some regions and phases; frost-affected, open terrain in others; freshwater pools and marshy ground where local conditions allowed. The wider British–Irish Ice Sheet was developing through the closing millennia of MIS 3. Its greatest Late Pleistocene extent came later, principally after about 27,000 calibrated years BP, though the timing, thickness and margins of ice differed across the archipelago and surrounding seas. Derryvree is valuable precisely because it preserves an interval that later ice might otherwise have erased.

Climate in the North Atlantic during MIS 3 was notably unstable on long, humanly unknowable timescales. Ice-core and marine records show repeated abrupt warmings and coolings, while the strength of Atlantic circulation, sea ice and the behaviour of continental ice masses changed together. It would be unwarranted to attach a particular one of these continental-scale oscillations to 31,153 BCE in Fermanagh. Yet that instability provides the proper setting for the alternation seen at Derryvree: an environment sufficiently cold for tundra vegetation and severe seasonal frost, but not continuously buried beneath glacier ice.

Freshwater Tundra at Derryvree

The buried sediments retain evidence of a cold freshwater ecosystem. Mosses, sedges and aquatic plants were identified alongside insect remains of northern, cold-climate character. The flora included bogbean, water-milfoil and dwarf willow, plants that point to wet ground and standing or slow-moving freshwater rather than dry, bare gravel alone. Alpine and arctic-alpine elements in the assemblage reinforce the impression of a short growing season and a largely treeless landscape. There is no basis for pictures of oak woods, hazel groves or cultivated clearings. Those belong to vastly later chapters of Irish environmental history.

The best interpretation is of a tundra-like wetland mosaic: shallow pools, silty margins, moss-rich ground, sedge beds and low shrubs, set amid more exposed frost-shattered terrain. “Tundra” is a useful ecological comparison, not a claim that every square kilometre matched a modern Arctic landscape. The fossils record what survived at one waterlogged locality, and such preservation naturally favours aquatic and wetland organisms. Nevertheless, they make the most important point securely: even in a severe cold phase, parts of Ireland could sustain productive freshwater habitats.

These deposits also illuminate environment more clearly than they reveal settlement. A plant seed or beetle fragment can demonstrate local conditions with remarkable specificity, but it cannot tell us who, if anyone, watched the pools, travelled past them, or returned in a later year. The people of later prehistoric Ireland left houses, monuments, tools and burials from which social arrangements can sometimes be inferred. Nothing comparable is known from Derryvree at this age. The archaeological silence is itself significant, particularly because later glaciers repeatedly reshaped the ground and because acidic soils and exposed landscapes preserve very little organic evidence.

Animals and a Continental Connection

Southern Ireland provides a different, though equally qualified, window on the period. Castlepook Cave near Doneraile in County Cork has yielded Ireland's richest known assemblage of vertebrate remains from the time leading towards the Last Glacial Maximum. Its collections include woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena, as well as wolf, Arctic fox and lemmings. These animals were not necessarily all present at the cave together, nor do the cave deposits constitute an undisturbed census of a single landscape. Bones accumulated over a long period, some were transported or disturbed by water, and carnivores themselves helped bring carcass parts into the cave.

Even so, the fauna establishes an essential fact: Ireland was intermittently connected to wider north-west European animal worlds. At times, routes across the then-lowered seas and changing coastal shelves allowed cold-adapted mammals to reach the island. A reindeer herd, mammoth, hyaena or wolf was not an emblem of an exclusively Irish ecosystem; it was part of a shifting continental fauna whose range expanded and contracted with climate, vegetation, sea level and ice. The sparse Irish record should caution against treating absence from a site as proof that a species was absent from the island. Equally, it does not permit every familiar Ice Age animal to be placed confidently in Fermanagh in this particular year.

Castlepook also demonstrates why old discoveries need continual re-examination. Modern radiocarbon pretreatment has shown that several earlier Irish cave dates were unreliable or too young. Re-dating has pushed some Castlepook fauna further back into MIS 3 and suggests that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum. The cave's scientific value lies not merely in its dramatic animal names but in its warning against easy certainty: collections excavated in the early twentieth century, and deposits disturbed by natural processes, require testing against improved methods.

The Unsettled Human Question

A reindeer femur from Castlepook has attracted particular attention because an incision on the bone has been interpreted as a possible cut made by a sharp stone tool during carcass processing. If that interpretation and its association are sustained, it may represent evidence for a brief human visit to Ireland during MIS 3, far earlier than the better-established post-glacial settlement record. It would imply neither a permanent colony nor a named "first Irish person", but a highly mobile group capable of reaching and exploiting a difficult northern landscape.

For 31,153 BCE, however, the careful conclusion remains more limited. No secure camp, hearth, tool assemblage, dwelling, grave or repeated occupation surface is known from Ireland for this precise period. Recent archaeological work at Castlepook located surviving sediments but did not identify cultural artefacts. The marked bone is important, but a single debated object cannot supply a detailed social history. There is no evidential basis for Irish political affairs, diplomacy, warfare, kinship systems, religious ceremonies, language, art or formal learning at this date. Such subjects are not missing chapters waiting to be filled by imagination; they are presently beyond the reach of the evidence.

Economy Without States

Nor can an economy or trade network be reconstructed in the usual sense. There were no known farms, fields, livestock, mines, markets, ports or metalworking communities in Ireland. If people did enter the island during a favourable interval, their subsistence would have depended on mobility and immediate knowledge of terrain, weather, water and animal behaviour. The possible processing of a reindeer carcass would fit an opportunistic hunting-and-scavenging economy, but that remains an inference rather than a demonstrated system. It should not be inflated into evidence for a settled Palaeolithic population.

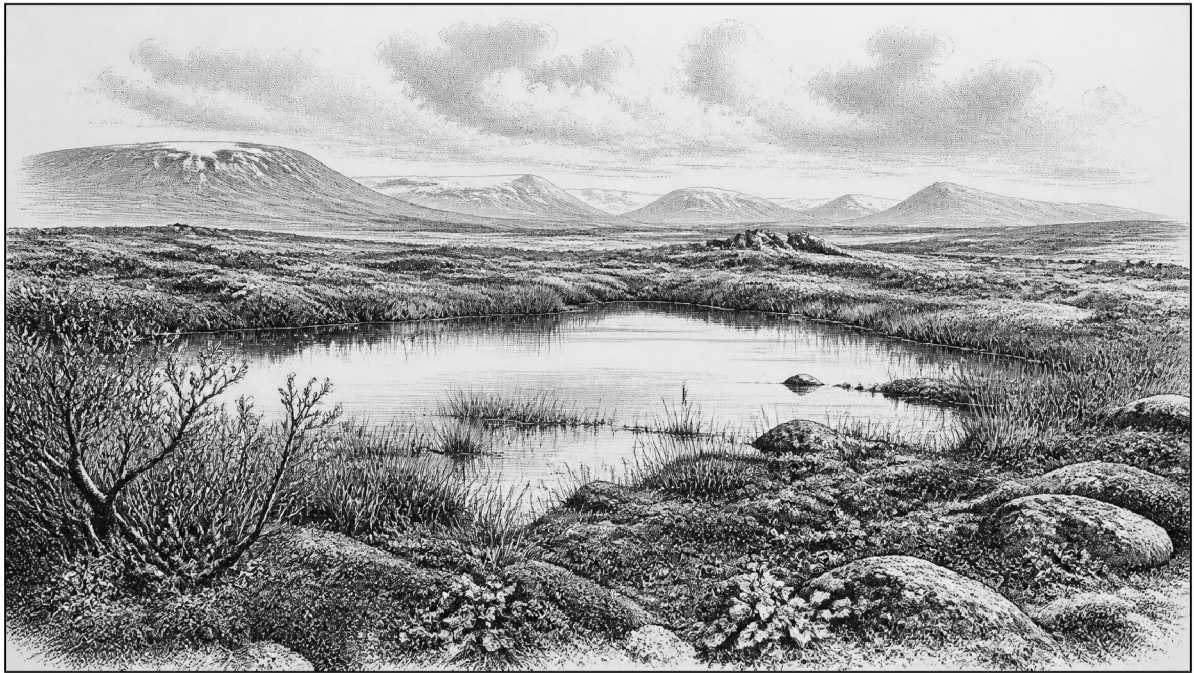
The real economic engine visible in the evidence was ecological productivity. Wetlands supplied plant growth and insect life; open ground and seasonal vegetation supported herbivores; predators and scavengers followed those animals; ice and meltwater repeatedly altered access to land and water. In this sense, the chief regional change was not the rise or fall of a polity but the instability of habitable terrain itself. A place capable of holding freshwater plants and animals could later be overridden by ice, its living surface entombed beneath till.

Ireland at this notional date was therefore a landscape of possibility, not certainty. BIRM-166 preserves the memory of cold water, mosses, sedges and northern insects in Fermanagh. Castlepook preserves evidence that large mammals—and perhaps transient people—could reach parts of the island during the wider MIS 3 world. Together, they replace an invented annual chronicle with something more compelling: a fragmentary but real history of ecosystems enduring between advances of ice.

Chapter 049 of 100

31152 BCE

Maguirebridge's Tundra Pool ^[49]



The label 31,152 BCE cannot denote an event, ruler, battle or season in Ireland. It is a modern calendar conversion, approximately 33,101 years before AD 1950, rather than a date recoverable from an Irish document or annual archaeological layer. At this depth of time, radiocarbon measurements require calibration and commonly produce ranges of centuries or millennia. The most relevant Irish evidence belongs broadly to the later part of Marine Isotope Stage 3 (MIS 3), a climatically unstable interval of the Late Pleistocene. It can illuminate an Ireland of cold open ground, freshwater hollows, caves and large mammals; it cannot provide a diary for one numbered year.

A Date Within a Range

The strongest environmental anchor for this notional year is Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 exposed a drumlin cut by a remarkable sequence: a thick lower till, organic freshwater silts and fine sands, then a distinct upper till. Till is the unsorted debris left by glacial ice. The order of the layers is therefore firm: ice affected the locality; an interval followed in which open water, sediment and living organisms accumulated; and a later glacier sealed the deposit beneath another blanket of debris. This is direct evidence for an ice-free episode at that site, not proof that every part of Ireland was simultaneously ice-free.

The Derryvree organic material yielded the conventional radiocarbon determination Birm-166, 30,500 years BP, with a substantial published uncertainty of +1,170 and -1,030 years. Scholarly discussion has placed the deposit broadly at about 36,900–31,700 calibrated years BP, or roughly 34,950–29,750 BCE. The modern label 31,152 BCE sits inside that broad span. It does *not* follow that a particular seed, insect,

animal or pool can be assigned to that precise year. The useful conclusion is more modest and more important: Derryvree preserves a local environmental window close to this period, while the precision of the calendar label exceeds that of the evidence.

Fresh Water Between Ice Advances

Derryvree was no forested landscape. Its fossil assemblage indicates a treeless, periglacial wetland or muskeg-like setting, with open tundra vegetation. Mosses, sedges, grasses and herbs grew around shallow water, while fossil remains include plants such as bogbean and lesser clubmoss, species able to survive in cold, open and wet conditions. Such finds are evidence of local ecology: plants grew in or beside the freshwater basin, and insects and other small organisms inhabited or reached it. They do not establish a settled human landscape, cultivated ground or a uniform climate across the island.

Even the term “Ice Age” needs care. MIS 3 was not a single, unchanging freeze. Greenland and North Atlantic records show repeated, abrupt shifts between harsher stadials and relatively milder interstadials. In south-west Ireland, uranium-thorium dates from broken speleothems in Crag Cave show that calcite formed episodically through MIS 3. Since cave calcite requires liquid water moving through the rock, this independently supports the view that temperate or at least above-freezing intervals punctuated the long cold stage. It does not tell us the weather at Maguiresbridge in 31,152 BCE, but it cautions against imagining uninterrupted, island-wide ice.

The broader trend was nevertheless towards a more formidable glacial world. Radiocarbon ages on sub-till organic deposits have been interpreted to show that much of Ireland remained largely ice-free until around 32,000 years ago, after which the last Irish Ice Sheet expanded. That reconstruction is continually refined, and the growth of ice was regionally uneven rather than an overnight transformation. By the later Last Glacial Maximum, ice would cover or profoundly reshape most of the island; at the date considered here, Ireland stood near the threshold of that expansion.

The Castlepook Fauna

County Cork provides the complementary record of animals. Castlepook Cave, also known as Mammoth Cave, near Doneraile in the Awbeg valley, is Ireland’s outstanding cave archive for pre-Last Glacial Maximum vertebrates. Its collections include woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. The assemblage demonstrates that Ireland could support, or be reached by, a much richer large-mammal fauna during parts of the cold stage than later historic Ireland.

That list should not be converted into a single crowded scene outside the cave in this particular year. Cave deposits collect remains over long intervals. Carnivores drag in prey; animals die in fissures or near entrances; water can disturb sediments; and the earliest Castlepook excavations, undertaken in the early twentieth century, did not record context to modern standards. Improved radiocarbon pretreatment has also shown that some earlier Irish cave dates were unreliable. Castlepook is compelling precisely because it preserves a long environmental record, but that longevity prevents its entire fauna from being treated as one simultaneous community.

Still, the fauna allows responsible ecological interpretation. Reindeer and giant deer imply available forage across open country; mammoth belongs to the wider cold-stage grassland-tundra world; and hyaena, wolf and bear indicate a food web in which large carcasses were contested or scavenged. Spotted hyaena remains are especially significant. Ireland has no living counterpart, and Castlepook is its sole

securely documented Irish locality. The fossil skulls, bones and coprolites are evidence of the species' former range, not evidence that every hyaena was resident rather than intermittently ranging through the landscape.

A Reindeer Bone and a Human Question

The period is also associated with Ireland's most provocative possible early human trace: a reindeer femur from Castlepook reported as about 33,000 years old and bearing a deep mark interpreted by zooarchaeologist Ruth Carden as damage from a sharp stone tool during carcass processing. If that interpretation is sustained, it would indicate that people handled a reindeer in Ireland during the Upper Palaeolithic, far earlier than the securely established evidence for post-glacial human activity.

The appropriate conclusion remains deliberately narrow. A marked bone is not a settlement. No securely associated hearth, stone-tool assemblage, dwelling floor, burial, food store or repeatedly occupied surface of comparable age has been published from Castlepook. Nor can the bone identify the number, origin, language, kinship or duration of stay of any people involved. Its radiocarbon age dates the animal's death, not necessarily the instant of marking. Natural breakage, carnivore action, water movement and the limited records of antiquarian excavation all require continued taphonomic scrutiny. Ireland around this time may have experienced a brief human visit or carcass-processing episode; permanent occupation is not demonstrated.

This caution matters because the later Irish archaeological record is clearer. A butchered brown-bear patella from Alice and Gwendoline Cave in County Clare has independent calibrated dates of about 12,810–12,590 cal BP, providing published evidence of Late Upper Palaeolithic human activity. That later find shows how direct dating and microscopic study can strengthen an old cave collection, but it cannot fill the vast chronological gap at Castlepook. The contrast explains why the Cork femur is important, yet still under assessment rather than a licence to invent an Ice Age population.

No Polity, No Proven Ritual

There is no evidential basis for political affairs, diplomacy, named peoples, leaders, warfare, territorial boundaries or institutions in Ireland at this date. Equally, no burial, shrine, artwork, dwelling, language, ritual deposit or learning tradition can responsibly be attributed to 31,152 BCE. The stone-mark interpretation on the Castlepook femur, if confirmed, would imply technical knowledge of a cutting edge and an encounter with an animal carcass. It would not reveal religious belief, social rank or a cultural identity. Silence in these categories is not a failure of imagination; it is the honest result of a record repeatedly disturbed by glaciers and preserved mainly as sediments and animal remains.

Everyday life is therefore best described through environmental constraints rather than invented scenes. Any humans who did reach Ireland would have needed mobility, knowledge of cold conditions and access to suitable stone, fuel, shelter and food. Those are reasonable inferences from the ecology and from Upper Palaeolithic lifeways elsewhere in north-west Europe, but they are not direct observations from Irish sites. There is no evidence here for farming, herding, pottery, metalwork, long-distance commerce or permanent villages. The practical economy visible in Ireland itself is the natural economy of wetland plants, grazing herbivores, predators, water, ice and shifting ground.

Routes Across a Changing Margin

Lower global sea levels expanded continental shelves and altered the geography around Ireland and Britain, but they did not guarantee a simple dry-land route. Ice margins, proglacial waters, changing coastlines and the Irish Sea basin could all create barriers or corridors at different times. The presence of mammals shows that dispersal into Ireland occurred during the cold stage; it does not map the route taken by a particular species, much less by people. The safest interpretation is that Ireland was connected to wider north-west European ecological networks intermittently and unevenly, while its insular position and growing ice made those connections precarious.

Thus the historical significance of 31,152 BCE lies not in an invented episode but in a landscape on the edge of profound change. At Derryvree, a tundra pool preserved plants and small life between two phases of glaciation. At Castlepook, caves retained traces of a lost fauna and perhaps one humanly modified reindeer bone. Together they show an Ireland capable of sustaining life during a fluctuating cold stage, shortly before expanding ice would erase, bury and fragment much of the evidence. That is a sparse archive, but it is enough to replace an empty prehistoric void with a more truthful picture: a changing island landscape, ecologically connected beyond its shores, and only faintly—still debatably—touched by people.

Chapter 050 of 100

31151 BCE

Bogbean Under Fermanagh^[50]



The label 31,151 BCE is useful only as a modern point on a very long timescale. It corresponds approximately to 33,100 years before present, conventionally counted from AD 1950, but no Irish evidence can identify an event, a person, or even a particular season in that calendar year. The appropriate setting is the later part of Marine Isotope Stage 3, a cold and climatically unstable phase of the Last Glacial Period. For Ireland, the evidence comes chiefly from buried sediments, fossil animal remains, cave deposits and broad radiocarbon ranges. It permits a responsible reconstruction of landscapes and possibilities; it does not provide a dated chronicle.

A Date Without a Diary

The most illuminating record close to this notional date lies at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed freshwater silts and fine sands between two thick layers of till, the unsorted material deposited by glacier ice. The sequence is important because its order is unambiguous: an earlier glacial episode laid down the lower till; a period without ice at that locality allowed a wetland or shallow freshwater body to accumulate sediment and organic remains; a later ice advance sealed the deposit beneath another till sheet.

Organic material from the Derryvree bed produced a conventional radiocarbon age of 30,500 years BP, with a substantial uncertainty of +1,170 and -1,030 years. Radiocarbon years are not calendar years. Their conversion depends on changing atmospheric carbon levels and carries widening uncertainty at this depth of time. Published discussion places the Derryvree deposit broadly at about 36,900–31,700 calibrated years BP, or roughly 34,950–29,750 BCE. Thus 31,151 BCE falls within the possible span of this archive, but it cannot be assigned to an individual layer, plant, insect or occurrence. Derryvree is a time-averaged environmental record, not a diary from one year.

Fresh Water Between Ice Advances

The Derryvree silts show that at least part of north-central Ireland was ice-free when they formed. They do not prove that the whole island was free of glacier ice at the same moment. The extent, thickness and timing of the developing Irish sector of the British–Irish Ice Sheet remain matters reconstructed from scattered terrestrial deposits, landforms, offshore sediments and numerical dating. What can be said with confidence is that the vast ice cover associated with the local Last Glacial Maximum came later. Recent syntheses use Derryvree as evidence for pre-Last Glacial Maximum ice-free conditions in this sector, before expansion towards the Donegal Bay region and the fuller glaciation of Ireland in Marine Isotope Stage 2.

This was therefore not Ireland beneath the familiar later ice sheet, nor an island of settled fields, woodland and shorelines recognisable today. It was a changing northern landscape close to the limits of severe cold. At Derryvree, water collected in a low basin amid terrain shaped by earlier glaciation. Frost, seasonal thaw, wind and moving water were likely as important as vegetation in forming the ground surface. Local conditions around a pool or marsh could differ sharply from those on exposed slopes, gravelly ridges or higher ground. The evidence is strongest for this locality, and care is needed before extending its picture across every Irish region.

An Open Tundra Wetland

Plant and animal traces in the Derryvree freshwater series indicate open tundra and a periglacial climate: cold conditions in which the ground experienced intense freezing, though the site itself was not then under glacier ice. Pollen was poorly preserved, but largely herbaceous. Mosses and macrofossils provided much of the clearer evidence. Finds included plants associated with damp, cold environments, among them bogbean (*Menyanthes trifoliata*) and mountain avens (*Dryas octopetala*). Such remains point to wet margins, shallow freshwater and low vegetation rather than closed forest.

That conclusion should be stated precisely. A bogbean seed does not recreate a continuous modern-style fen, and mountain avens does not map the entire countryside. Yet together with the sedimentary setting, the assemblage demonstrates that plants able to occupy cold freshwater edges and open ground survived locally. The landscape probably comprised a mosaic: pools and muddy margins, moss-rich wet ground, sedge or grass communities, herbs, sparse scrub in favourable niches and more exposed stony or frost-disturbed surfaces. Short growing seasons and a severe winter climate limited tree cover. Derryvree gives Ireland one of its rare direct glimpses of an Ice Age flora before the final major glacial advance.

The climate was not static. Marine Isotope Stage 3 was marked across the North Atlantic region by abrupt shifts between relatively milder interstadial conditions and colder stadials. Irish deposits cannot always be matched neatly to one named Greenland event, especially given chronological uncertainty, but their character reflects a world prone to rapid environmental change. A shallow pool may have persisted for centuries or millennia while its catchment altered through frost action, sediment influx and changes in seasonal meltwater. The later burial of Derryvree beneath till is a material reminder that apparently viable cold-country habitats could be erased or transformed by renewed ice expansion.

Animals in a Connected Northwest Europe

Cave deposits and old collections from southern Ireland show that the island's Late Pleistocene animal world was much richer than its later historic fauna. Research on the Irish Quaternary fauna has documented the presence, at different times between at least about 45,000 and 20,000 years ago, of mammals including reindeer, mammoth, giant deer, wolf and spotted hyaena. Castlepook Cave, near Doneraile in north County Cork, is especially important. Its deposits and collections contain remains from a cold-stage fauna, although cave accumulations are complicated records: bones may have been carried in by carnivores, water, gravity or later disturbance, and need not represent a single living community or date.

Reindeer are particularly relevant to an open, cool landscape, but their bones alone do not establish how numerous they were in Ireland, whether they made regular migrations, or which precise habitats they used in 31,151 BCE. Likewise, hyaena remains and gnawed bones at Castlepook demonstrate the presence of large carnivores in the broader Pleistocene faunal record, not a scene of hyaenas and reindeer meeting at every Irish wetland. Revised radiocarbon work has also shown why older cave chronologies require reassessment: several Castlepook dates became significantly older when bones were re-dated using improved methods. Interpretation must follow the dated specimen and its context, rather than repeating inherited assumptions about an undifferentiated 'Ice Age fauna'.

The Human Question

There is no secure settlement, hearth, dwelling, burial, tool-making floor or community known from Ireland that can be placed specifically in 31,151 BCE. Consequently, no responsible account can describe an Irish tribe, chief, political territory, war, alliance, religious rite, language or system of learning for this date. There were no known states, institutions or diplomatic relations on the island in the historical sense. The absence of such evidence is not proof that no person ever crossed the region during the wider period; it is a limit on what archaeology presently demonstrates.

A reindeer femur from Castlepook has been publicly reported as bearing deep marks interpreted as cuts made by a stone tool and as dating to roughly 33,000 years ago. If that interpretation is sustained by full published contextual and taphonomic study, it would be exceptionally important evidence for very early human activity in Ireland: people may have processed an animal carcass in, or near, north Cork during the broader interval. At present, however, the claim should not be inflated into proof of a permanent population, a camp at the cave, a hunting party on a specified date, or an origin story for later Irish communities. A marked bone is not a settlement assemblage, and a date on animal collagen does not identify the exact moment of butchery.

The possibility is nevertheless historically significant. During lower sea-level phases, Ireland formed part of a north-west European world with very different coastlines and connections from those of today. Animal colonisation itself shows that routes existed across changing terrestrial and marine barriers at various times. Any human visitors would have belonged to wider Upper Palaeolithic populations of north-west Europe, reliant on mobility, detailed environmental knowledge, stone technology and the processing of animal resources. That is an inference from regional human prehistory, not direct evidence of a settled Irish society.

Economy, Culture and Silence

For this date, 'economy' can only mean ecology and subsistence possibilities, not markets or trade. The available fauna suggests that large herbivores and scavenging carnivores moved through parts of Ireland during the wider Middle Midlandian interval. If people were present, meat, fat, hide, sinew, bone and perhaps antler would have been valuable materials; but no Irish artefact assemblage of this age permits a reconstruction of their techniques, exchange networks or seasonal rounds. Nor is there evidence for farming, animal husbandry, ceramics, metalworking, monuments, formal burial, art or writing.

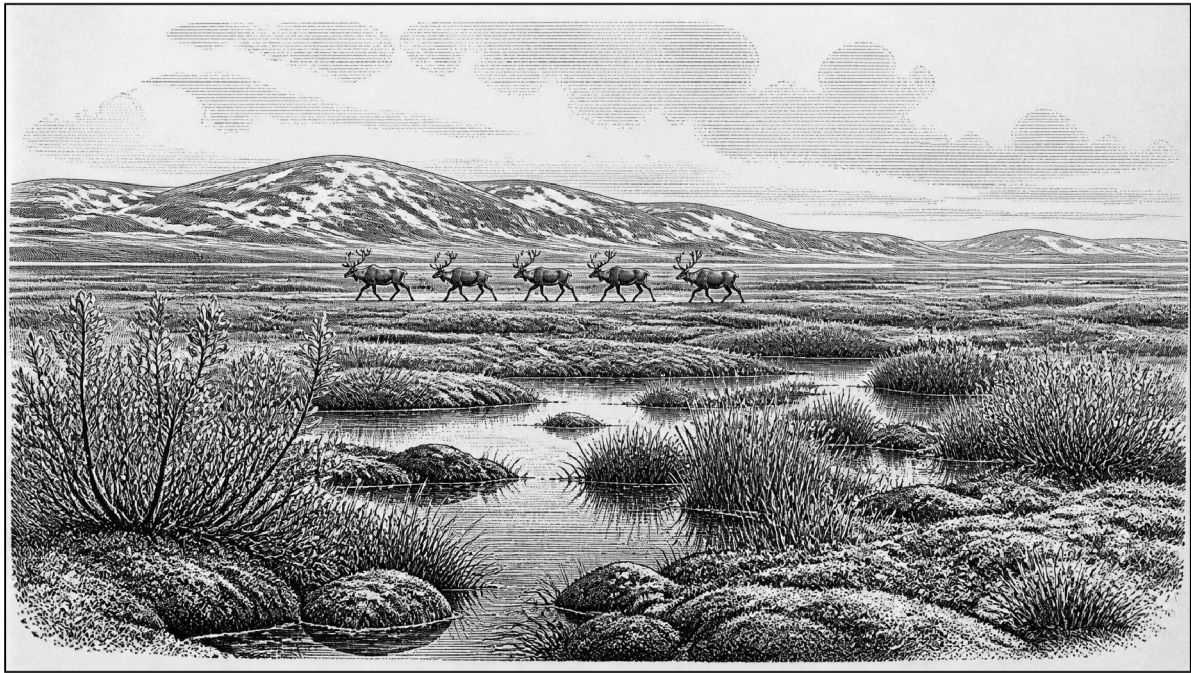
Culture is visible instead in the scientific culture of evidence: a seed in water-laid silt, a moss fragment, a reindeer bone, tooth marks, sediment between tills and the laboratory methods that date or re-date them. These small survivals correct the misleading impression that prehistoric Ireland was either permanently frozen or empty until the much later Mesolithic. Around the modern label 31,151 BCE, Ireland was a climatically harsh but locally habitable part of a fluctuating Pleistocene north-west Europe. Its best-attested story is environmental: tundra wetland at Derryvree, mobile fauna across changing landscapes, and an unresolved but potentially momentous question over the earliest human presence.

The decisive change still lay ahead. As ice expanded during the succeeding colder phase, it would cover or profoundly remodel much of the island, destroying many surface traces and helping explain why the archaeological record is so thin. For now, the responsible portrait is neither a blank nor a legend. It is a cold freshwater basin beneath the future drumlin of Fermanagh, preserving a narrow, calibrated window onto Ireland before the deepest freeze.

Chapter 051 of 100

31150 BCE

Derryvree's Tundra Threshold ^[51]



“31,150 BCE” is a modern chronological label, not a date that can be matched to a recorded Irish event, ruler, journey or settlement. At this depth of time, calendar-year precision is unavailable. The label sits about 33,100 years before AD 1950, the conventional radiocarbon reference point, but radiocarbon ages and calendar ages are not interchangeable by simple arithmetic. Ireland can instead be discussed through broad calibrated ranges, stratified deposits and changing ecological evidence. The relevant setting is the later part of Marine Isotope Stage 3, within the Midlandian cold stage of the Irish Pleistocene: a long, unstable interval before the maximum extent of the last British–Irish Ice Sheet.

A Date Within a Wider Interval

The closest securely dated Irish environmental archive is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 exposed a drumlin cut through by a remarkable sequence: older glacial till below, freshwater silts, fine sands and organic material in the middle, and later till above. Till is debris laid down directly by ice. The sequence therefore establishes an important order of events: ice affected the locality; an interval followed in which standing or slow-moving freshwater and vegetation existed; and glacier ice later advanced across and sealed the deposits.

Organic material from the Derryvree freshwater bed produced a conventional radiocarbon determination of 30,500 +1,170/–1,030 BP. Its uncertainty is substantial, and calibration turns it into a broad calendar range rather than a single year. The numbered year used here falls within the wider late-MIS-3 world to which the deposit is relevant, but it cannot responsibly be claimed that a particular

Derryvree pool, plant or animal lived in the exact year 31,150 BCE. That distinction matters. The bed is powerful evidence for a cold, locally ice-free phase in south Fermanagh; it is not an annual diary and does not describe all Ireland at once.

Freshwater Beneath a Future Glacier

Derryvree preserves an unexpectedly detailed glimpse of conditions in a landscape now hidden beneath a drumlin. Pollen, plant macrofossils, mosses and small animal remains point to open, largely treeless tundra or tundra-like vegetation under a periglacial climate. Periglacial does not mean buried beneath glacier ice: it means a severe cold-climate environment shaped by frost, seasonal freezing and sparse plant cover at or near an ice margin.

The plants identified or reported from this deposit include grasses and sedges, dwarf willow, mountain-avens, alpine clubmoss, bogbean and water-milfoil, alongside a notable moss flora. Together they suggest a patchwork rather than a uniform white wilderness: damp hollows, shallow pools, sedge-rich margins and low vegetation on better-drained ground. Bogbean and water-milfoil are especially useful reminders that even a severe cold landscape could include freshwater habitats. Yet the evidence does not permit a picturesque reconstruction of dense woodland, settled farmland or a richly stocked lake. Tree pollen was scant and may have been redeposited from older sediments; the dominant signal is of exposed ground and sparse herbaceous cover.

Such a setting would have been seasonal and vulnerable. Short summers could allow plants to flower, insects to breed and wet places to support aquatic life. Long winters, frost disturbance and thin soils would have restricted growth. The important historical development was environmental opportunity on a narrow margin: enough ice-free ground for vegetation and animals to occupy, yet a landscape that later glacier movement would partly erase, bury or rearrange.

Before the Ice Sheet's Maximum

Ireland at this time should not be imagined as either entirely ice-covered or wholly open. The Derryvree sequence proves that at least one Fermanagh locality experienced an ice-free freshwater interval between glacial episodes. Regional conditions could differ sharply according to elevation, latitude, proximity to ice and changing climate. The later maximum of the British–Irish Ice Sheet was reached much later, broadly around 26,000–24,000 calibrated years BP in the western and Irish Sea records. Thus 31,150 BCE belongs to a phase of fluctuating cold and ice growth before that better-defined maximum, not to a moment when a single ice margin can be drawn confidently around the whole island.

Lower global sea levels exposed areas now submerged around north-west Europe, but the exact routes available between Ireland, Britain and continental Europe changed with sea level, ice and local topography. It is unwise to write of an assured Irish “land bridge” for this particular date. What can be said is that the geography of movement was unlike that of the modern island, while passage through cold, glaciated or waterlogged terrain would still have been difficult. The sea, ice and exposed shelves were active parts of the landscape, not blank spaces between modern coastlines.

Animals in a Cold Mosaic

Irish caves, especially Castlepook Cave near Doneraile in County Cork, provide a second kind of evidence: animal bone assemblages. Redating has shown that some older measurements from cave collections require revision, but it has also demonstrated that a range of mammals occurred in Ireland during MIS 3. Reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings, woolly mammoth and spotted hyaena are represented in the wider Irish cave record. Not every specimen is contemporary with every other specimen, and disturbed nineteenth- and early twentieth-century cave excavations demand caution. Still, the fauna demonstrates that Ireland was not biologically empty during the broader period.

Reindeer are particularly appropriate to the Derryvree-type environment: mobile grazers suited to open country, though their presence does not tell us the size or route of a herd in any one season. Giant deer evoke productive open habitats but should not be projected automatically into every part of the island. Hyaenas and wolves demonstrate that carcasses and caves had complex histories. A cave bone may record an animal's death elsewhere, scavenging, transport by carnivores and later sediment movement before excavation. For that reason, cave fauna supplies a regional ecological range, not a census of a single living community.

The Human Question at Castlepook

The most debated possible connection with people is a reindeer femur from Castlepook Cave. County Cork heritage material identifies a cut mark on it as consistent with a sharp stone tool and dates the object broadly to c. 31,000 BCE. If that reading is sustained, it would indicate that people handled and butchered a reindeer in Ireland during the Palaeolithic, far earlier than the island's well-established post-glacial hunter-gatherer record. It is an important proposition precisely because the object is so slight: a marked bone, rather than a camp.

The limits must be kept in view. No securely associated stone-tool assemblage, hearth, dwelling, burial, occupation surface, named group or human remains of this age have been recovered at Castlepook. Nor does one bone establish permanent residence, population continuity, language, ancestry or a migration route. Cave deposits have complicated formation histories, while improved pretreatment and redating have altered the chronology of several Irish Pleistocene faunal specimens. The responsible conclusion for 31,150 BCE is therefore not that Ireland possessed a settled human society, but that a possible episode of human butchery belongs to the archaeological question now being tested.

What Cannot Yet Be Written

There is no evidence from Ireland around this point for political institutions, chiefs, territories, diplomacy, warfare, formal religion, monuments, writing, schools, markets or long-distance trade. There are no known houses, villages, boats, fields or graves that can be securely assigned to this date. It would be misleading to fill those silences with assumptions drawn from later Mesolithic Ireland or from Upper Palaeolithic societies elsewhere in Europe.

If people did enter the island during a favourable interval, they may have travelled in very small, mobile groups and relied heavily on knowledge of animal movements, weather, stone sources and safe routes. That is an interpretation from comparable European hunter-gatherer contexts, not a fact

demonstrated in Ireland. The direct Irish evidence remains environmental and faunal: cold freshwater sediments at Derryvree; a sparse tundra flora; and cave bones that indicate animal life in an unstable Pleistocene landscape.

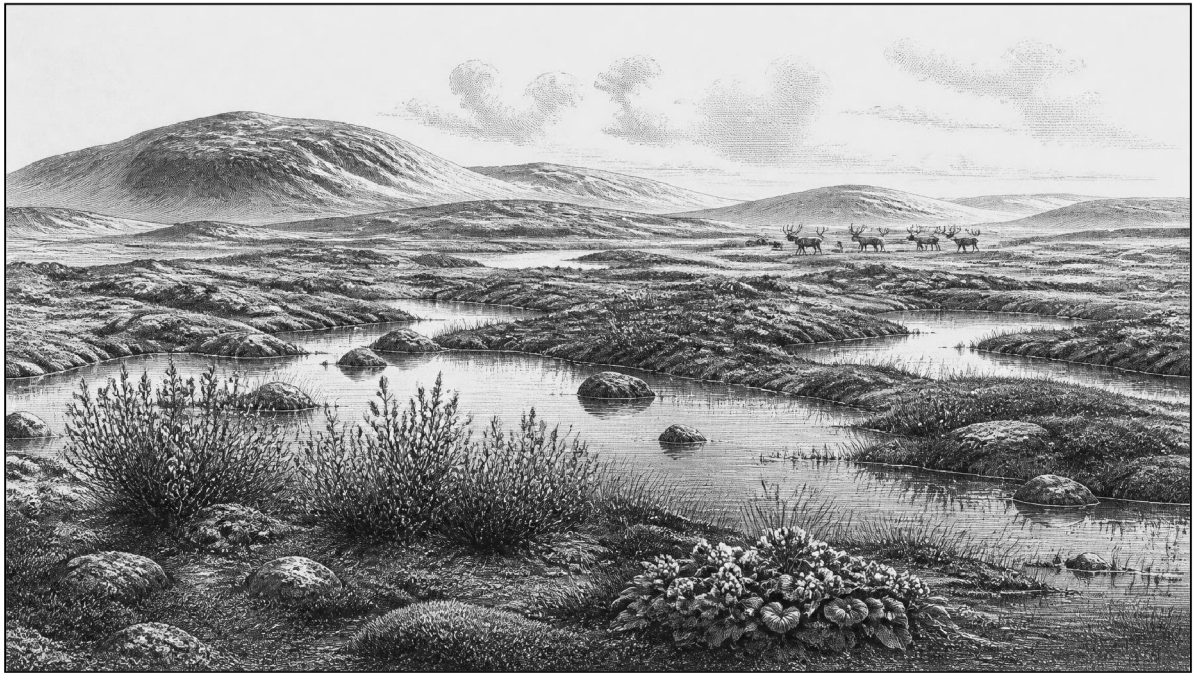
An Archive of Possibility

The history of Ireland at 31,150 BCE is consequently a history of thresholds. Derryvree shows life persisting in a cold, open wetland between advances of ice. Castlepook and other caves show that large mammals moved through southern Irish landscapes during the wider MIS-3 interval. A single marked reindeer bone raises, but does not settle, the question of human presence. Later glaciation destroyed or buried much of the evidence that might have answered it more fully. What survives is enough to replace the old image of an empty, uniformly frozen Ireland with a more careful one: a changing country of tundra, freshwater, animals and uncertain human opportunity.

Chapter 052 of 100

31149 BCE

Menyanthes Under the Drumlin^[52]



The label 31,149 BCE is a modern chronological convenience, not a date anyone living in Ireland could have recorded. In archaeological terms it falls roughly 33,100 calibrated years before present, where “present” is conventionally AD 1950. At that depth of time, neither radiocarbon dating nor stratigraphy can identify a particular Irish year, season, community or event. The responsible subject is therefore not an annual chronicle but a carefully bounded view of Ireland during the later Pleistocene: a cold, unstable phase of the last Ice Age known as Marine Isotope Stage 3.

The strongest evidence relevant to this notional date comes from sediments, animal bones, cave deposits and glacial landforms. It is unevenly preserved and often difficult to date. These sources can show that environments existed, that particular animals reached Ireland, and that ice advanced and retreated. They say far less about people. There were no states, rulers, borders, written languages, farms, villages or monuments that can be recovered for Ireland at this time. Political affairs, diplomacy and organised warfare therefore lie beyond the evidence rather than merely being unknown details awaiting discovery.

A Wide Date, Not a Recorded Year

The closest Irish environmental archive is Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin, a streamlined hill later shaped by glacier ice, and exposed a remarkable sequence. Freshwater silts and fine sands rich in organic material lay between two deposits of till: stony, unsorted sediment left by moving ice. The basic order is secure. A glacier had deposited the lower till; afterwards, ice was absent locally long enough for water, sediment and organic remains to accumulate; a later glacial advance buried the deposit beneath upper till.

The Derryvree organic series produced a conventional radiocarbon age of about 30,500 years before present, with a large laboratory uncertainty. When calibrated, published estimates place the deposit broadly around 36,900–31,700 calibrated years before present, approximately 34,950–29,750 BCE. The nominal date 31,149 BCE lies within this broad span, but cannot be attached to a single layer, seed, insect or episode at the site. Calibration is essential because atmospheric carbon-14 has varied through time; moreover, uncertainty necessarily expands far beyond the range of written history.

This distinction matters. Derryvree is not proof that all of Ireland shared one climate at once, nor does it demonstrate that the whole island was free of ice. It is a local archive, sealed and preserved in exceptional circumstances. Its importance is precisely that it demonstrates environmental change in northern Ireland during a period often obscured by later glacial erosion.

A Cold Freshwater Landscape

The organic remains at Derryvree point to a treeless or nearly treeless periglacial wetland, sometimes described as a muskeg-like environment. Mosses, sedges and cold-adapted flowering plants occurred around shallow water and saturated ground. Particularly evocative is bogbean, *Menyanthes trifoliata*, a three-leaved wetland plant still familiar in suitable Irish habitats today. Its presence in a Pleistocene deposit does not make the ancient landscape modern; rather, it shows that some plants capable of surviving in cold, waterlogged ground occupied this particular basin.

Other botanical and insect evidence indicates open terrain with short growing seasons. Dwarf willow, mountain-avens, arctic clubmoss and water-milfoil belong to the wider picture reconstructed from the Derryvree material. Such evidence supports an interpretation of sedgy margins, mossy ground, shallow pools and sparse low vegetation rather than forest. Frost processes would have been important in shaping soils and drainage. The land was productive only seasonally, but it was not a sterile wasteland. Small freshwater habitats could sustain plant and invertebrate communities even under severe climatic conditions.

The climatic background was unstable. Marine Isotope Stage 3 contained abrupt shifts in North Atlantic climate, and Ireland stood at the Atlantic edge of a changing north-west European world. The Derryvree sequence records one interval between ice advances, while the wider geological record shows that the British–Irish Ice Sheet was building towards its later maximum. Reviews of that ice sheet commonly place its major build-up after roughly 35,000–32,000 years ago, with its maximum extent substantially later, around 27,000–21,000 years ago. Around 31,149 BCE, then, Ireland was not simply “before the ice” or “under the ice”: conditions varied through time and from region to region.

Castlepook and the Animal World

In north County Cork, Castlepook Cave near Doneraile provides the principal Irish faunal record for this broad pre-Last Glacial Maximum interval. Excavated mainly in the early twentieth century, its deposits and collections have yielded remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, mountain hare, Norwegian and collared lemmings, and spotted hyaena. Geological Survey Ireland describes Castlepook as Ireland’s richest known site for vertebrate fauna before the Last Glacial Maximum.

Those animals should not be imagined as a single herd or one perfectly simultaneous food chain. Cave deposits often combine material introduced over long periods by carnivores, water, sediment movement and earlier excavators. Some of Castlepook’s bones derive from disturbed contexts, and

radiocarbon reassessment has shown that older determinations require caution. Yet the assemblage securely establishes a striking fact: during portions of the middle and later Ice Age, Ireland supported or was reached by a varied cold-stage mammal fauna.

Reindeer and lemmings suit the evidence for open, cold country; mammoth and giant deer imply extensive foraging landscapes; wolves and spotted hyaenas indicate large carnivores able to exploit such prey, carrion or both. The hyaena is especially notable because Castlepook remains Ireland's only recognised site for the species. Its bones, teeth and coprolites demonstrate that caves were not neutral shelters: they could be predator refuges and bone accumulators. A cave collection is therefore evidence for ecological relationships, but not a straightforward census of creatures living outside its entrance in a single year.

The Human Question

No securely excavated settlement, hearth, stone-tool assemblage, dwelling, burial or occupation surface has been demonstrated in Ireland for this period. That absence is important. It means that there is no basis for describing an Irish population's language, kinship, religious practice, artistic tradition, leadership or territorial organisation around 31,149 BCE. Nor is there evidence for agriculture, domesticated animals, pottery, metalworking, long-distance trade networks or permanent settlement. Economy, if people were present at all, cannot responsibly be reconstructed beyond the possibility of short-term hunting, scavenging or movement through a changing landscape.

A reindeer femur from the old Castlepook collection has nevertheless made this period archaeologically consequential. It has been publicly reported as approximately 33,000 years old and as carrying a deep mark interpreted as a possible stone-tool incision associated with butchery. If the identification of the mark and its contemporaneity with the animal's death are confirmed, it would be evidence that people handled a reindeer in Ireland far earlier than the securely evidenced terminal-Pleistocene human activity at Alice and Gwendoline Cave, County Clare.

At present, however, the inference must remain limited. The bone's date measures when the animal died, not automatically when the mark was made; the cave collection comes from early excavations and lacks the secure associated context expected of a modern excavation. One modified bone would not prove a resident community, a seasonal camp, a migration route or continuous occupation. It certainly cannot demonstrate political communities or a developed Irish Palaeolithic culture. The most careful wording is that Castlepook presents a significant, unresolved indication of possible human activity within an animal-rich Ice Age landscape.

Connections Without Trade or Diplomacy

Ireland's fauna nevertheless reveals wider regional connections. Reindeer, mammoth, hyaena and other cold-stage mammals could only have arrived through changing routes across the then-exposed or narrowed landscapes and seaways of north-west Europe. Lower global sea levels altered coastlines profoundly, although the exact accessibility of Ireland varied with time, ice cover and local geography. Animals did not cross modern political frontiers; their presence records ecological movement, not "trade" or diplomacy.

If people did reach Ireland in this interval, they too would have moved through that broader north-west European setting. But no material from Ireland identifies where they came from, how many travelled, whether they returned, or whether they encountered others. It would be misleading to import the

rich evidence for Upper Palaeolithic art, ritual and tool traditions elsewhere in Europe and label it Irish. Ireland's own evidence has not yet yielded comparable objects for this age.

What This Moment Can Mean

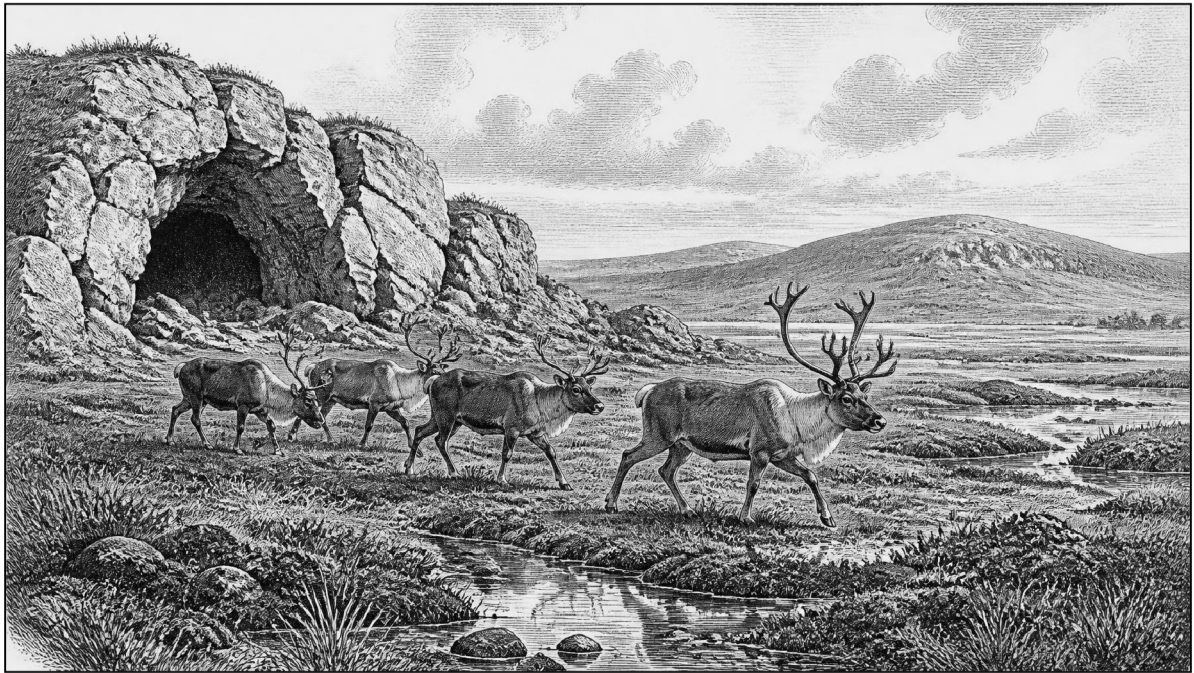
Around the notional year 31,149 BCE, Ireland was a place of environmental opportunity and extreme vulnerability. At Derryvree, a cold freshwater basin supported wetland plants and small animal life between episodes of glaciation. At Castlepook, the accumulated remains of large herbivores and predators show that cold-adapted mammals entered or persisted in parts of the island during the broader period. Later expansion of ice would destroy, bury or transform many traces of these landscapes.

The history of this date is therefore not one of named leaders, battles or settlements. It is the history of a drumlin's sealed wetland, cave-bone assemblages, moving ice and animals adapted to open northern ground. These are fragmentary witnesses, but they are substantial ones. They show that prehistoric Ireland was neither timeless nor empty: it was a dynamic Ice Age environment whose surviving evidence sets firm limits on imagination while still revealing a surprisingly complex natural world.

Chapter 053 of 100

31148 BCE

Doneraile's Reindeer Lair^[53]



31,148 BCE is a modern retrospective label, not a year that can be recovered from an Irish Ice Age calendar. No written record, ruler, settlement sequence or event can be assigned to this point with annual precision. The responsible approach is to place it within the Late Pleistocene, in Marine Isotope Stage 3, and to use dated deposits as broad chronological windows. Most importantly, organic sediments buried beneath a drumlin at Derryvree, near Maguiresbridge in County Fermanagh, have produced a calibrated range of roughly 36,900–31,700 years before present. The numbered year falls within that wide interval, but it does not identify a particular season, occurrence or human generation.

What emerges is not a conventional political history but a landscape history: a cold, treeless or nearly treeless Ireland of wetlands, open ground and changing ice margins; a country inhabited by Ice Age animals; and a tantalising, still unconfirmed possibility that small groups of people may have reached its south-western edge. The evidence is powerful precisely because it is fragmentary. Bones, pollen, seeds, insect remains, cave sediments, landforms and isotope dates can illuminate conditions. They cannot furnish a chronicle.

A Midlandian Interval

Ireland was in the Midlandian phase of the last glacial cycle, although the island was not yet uniformly overwhelmed by the ice sheet that would later reach its greatest extent. The period around this modern date belongs to a long and unstable climatic deterioration before the Last Glacial Maximum. Recent reconstructions of the British–Irish Ice Sheet show that its growth, advance and eventual retreat varied greatly between regions. It is therefore misleading to picture a simple, island-wide white blanket arriving on a single date.

Derryvree provides an unusually direct Irish window on this earlier phase. Roadworks in 1969 cut through a drumlin and exposed organic silts and fine sands lying between two thick layers of glacial till. In plain terms, a freshwater environment developed after one episode of ice deposition and before another. The upper till eventually sealed that fragile environmental archive. Its preservation is exceptional: later ice commonly eroded or rearranged deposits that might otherwise tell us about pre-maximum Ireland.

The original radiocarbon determination from the Derryvree organic bed was about 30,500 radiocarbon years before present, with substantial laboratory uncertainty. Calibration and later correlation place the deposit more usefully within a multi-millennial interval, approximately 31.7–36.9 thousand calibrated years before present. Such ranges matter. Radiocarbon years are not identical to calendar years, and dates approaching the method's limit need cautious treatment. Derryvree can therefore support a description of an interval around 31,148 BCE, not an assertion that its pond existed in that exact named year.

Pools Beneath Future Ice

The Derryvree fossils indicate a harsh but living freshwater setting. Plant remains and insects point to a mossy, wet ground with open pools, sedges and other cold-tolerant vegetation: a tundra or muskeg-like mosaic rather than a forest. Mountain-avens, dwarf willow, arctic-alpine herbs and aquatic plants are among the kinds of evidence associated with the wider reconstruction. The vegetation was low, patchy and exposed to wind, but it was not a sterile polar desert. In the brief growing season, wet hollows and shallow water could sustain a surprisingly varied community of plants and invertebrates.

This was a landscape of acute seasonality. Frozen or deeply chilled ground in winter, meltwater, standing water and short summers shaped where organisms could live. The conventional image of 'Ireland before the ice' as a single tundra plain is too flat. Sheltered basins, river margins, exposed slopes and limestone country would have offered different conditions. Yet woodland was absent or extremely restricted. There were no oak groves, farms, hedged fields or coast-to-coast human tracks: those belong to vastly later Irish worlds.

Regional change was already the central force in life. Ice accumulated in uplands and elsewhere in the British–Irish region, while habitable ground could expand or contract as climate fluctuated. Lower sea levels altered the surrounding shelf, but they did not automatically make Ireland an accessible peninsula. The precise configuration of sea, ice, coast and routes across the Irish Sea at this time remains uncertain. Any claim of a dependable land bridge, or of a particular migration corridor, would go beyond the evidence.

Reindeer and Carnivores

Irish cave collections provide another, less neatly dated record of the broader Ice Age fauna. Castlepook Cave near Doneraile, in north County Cork, is especially important. Excavated in the early twentieth century and later re-examined through the Irish Quaternary Fauna Project, it yielded remains attributed to reindeer, woolly mammoth, giant deer, brown bear, wolf, spotted hyaena, arctic fox, hare and lemming. Not every bone belongs to the same episode. Caves are accumulators: carnivores drag in prey, animals die in or near entrances, water moves sediment, and antiquarian excavation can disturb the original relationships.

For that reason Castlepook cannot be read as a snapshot of one valley on one day. It nonetheless establishes that Ireland was part of a wider north-west European world in which cold-adapted mammals could reach and inhabit available terrain. Reindeer are especially evocative because open, lichen- and

herb-rich country would have suited them. Mammoth and giant deer signal that, at different times represented in the deposits, large herbivores occupied the island as well. Hyaenas, wolves and bears indicate that predation and scavenging structured this ecosystem as much as grasses and sedges did.

The cave itself was probably more often a carnivore den or bone trap than a human home. A reindeer carcass could be killed on open ground, partly consumed there, then carried or scattered by scavengers. That is an important corrective to romantic pictures of people sheltering beside a cave fire. Even when animal remains establish that large mammals lived in Ireland, they do not automatically demonstrate the presence of hunters.

The Marked Femur

One Castlepook find makes the question of people impossible to ignore: a reindeer femur fragment, held in the National Museum of Ireland's natural-history collections, has been reported as bearing a deep mark interpreted by zooarchaeologist Ruth Carden as made by a sharp stone tool during carcass processing. It has also been publicly described as around 33,000 years old in radiocarbon terms, broadly relevant to the period represented by this article. If the mark is genuinely anthropogenic and contemporary with the bone, it may record an Upper Palaeolithic visit to Ireland far earlier than the island's previously accepted human evidence.

That conditional language is essential. The object is not accompanied by a securely excavated hearth, a stone-tool assemblage, a habitation surface, human remains or a sequence of food waste. The old cave collection contains material accumulated and recovered under conditions that make precise association difficult. The date of an animal bone does not by itself prove the date, agent or purpose of a surface modification. Nor can one marked bone show whether its maker lived locally, arrived on a short hunting foray, travelled with a family group, or visited Ireland repeatedly.

The claim should thus be treated as a significant research lead rather than as proof that Ireland had a settled Palaeolithic population. It does, however, give a concrete historical question to the landscape: might mobile people, already established elsewhere in north-west Europe, have reached this cold island and processed a reindeer? Further microscopic analysis, direct dating, careful excavation and securely stratified finds are needed to move from possibility to a firmer conclusion.

No Politics, No Diplomacy

There is no evidence for political institutions, named communities, warfare, diplomacy, religion, formal learning or trade networks in Ireland at this date. It would be wrong to fill that silence with analogies from later prehistory. There were no known chiefs, kingdoms, monuments, graves, ritual places, domestic structures or exchange goods. If people did make a brief incursion, their social world may have involved co-operation, knowledge of animal movements, skilled use of stone edges and decisions about risk, food and shelter; but these are inferences from the practical demands of northern hunter-gatherer life, not facts demonstrated in Ireland.

Equally, the economy cannot be described as an Irish hunting economy. Reindeer bones and a possible cut mark suggest animal exploitation only in the most limited sense. No Irish site of this age has supplied the evidence required to reconstruct diet, season of occupation, clothing, tools, routes, exchange or household organisation. The material record more securely reveals the economy of non-human life: grazing herbivores, predators, scavengers and wetland organisms adapting to an unstable cold environment.

What This Date Can Mean

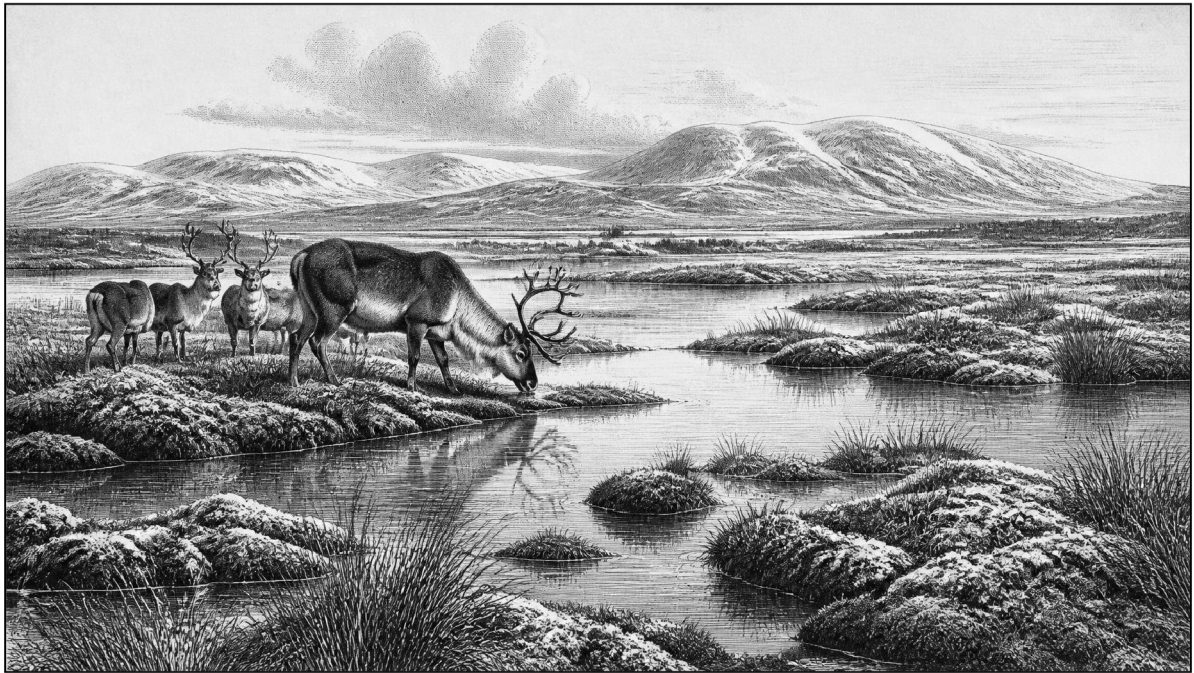
The greatest development around 31,148 BCE was environmental rather than political. Ireland lay in a narrowing interval between survivable open habitats and the later expansion of major ice cover. Derryvree's freshwater deposits show that tundra wetland ecosystems existed during this broad phase; Castlepook's fauna shows that large mammals and carnivores formed part of the island's Pleistocene history; and the marked reindeer femur raises, but does not settle, the question of early people.

Later glaciation was both an ancient event and a historian's obstacle. It reshaped the ground, deposited tills, carved landforms and probably destroyed many archaeological sites. The scarcity of evidence is therefore not proof that no person ever entered Ireland before the Last Glacial Maximum. Neither is it licence to claim a lost population. For this distant point in time, the most defensible Irish history is one of tundra pools beneath future ice, roaming animals around limestone caves, and a single contested incision that may preserve the faintest trace of a human hand.

Chapter 054 of 100

31147 BCE

The Fermanagh Herbarium ^[54]



31,147 BCE is not a year for which Ireland possesses an annual history. No one on the island recorded a calendar, named a ruler, built a datable monument or left a settlement that can be assigned to this particular point. The label is modern: counted from the conventional radiocarbon ‘present’ of AD 1950, it lies roughly 33,096 years before present. The responsible subject is therefore a long Late Pleistocene interval, not an event. Ireland was within Marine Isotope Stage 3, a volatile part of the last Ice Age marked across the North Atlantic by substantial climatic shifts over centuries and millennia.

The closest Irish evidence comes from a buried wetland at Derryvree, near Maguiresbridge in County Fermanagh. Its organic sediments gave a radiocarbon determination of 30,500 years BP, with a large laboratory uncertainty. Published discussions commonly express its calibrated age as approximately 36,900–31,700 calendar years BP, or broadly 34,950–29,750 BCE. That range encompasses 31,147 BCE, but it emphatically does not date a particular day, season, pool or living creature to that year. Calibration translates radiocarbon measurements into calendar estimates; at this depth in time the resulting ranges remain wide. The evidence can illuminate Ireland around this point, not narrate its annual affairs.

Wetland Between Ice Advances

Derryvree’s importance lies in its position. Roadworks exposed organic-rich freshwater silts and fine sands lying between two layers of till, the unsorted debris left by glacier ice. The sequence shows that an earlier phase of local glaciation was followed by an interval in which water, vegetation and sediment accumulated, before a later ice advance buried the wetland beneath fresh till. The deposit survived because it was sealed; much comparable evidence was later eroded, displaced or concealed by ice.

This is not evidence that all Ireland was ice-free, nor that conditions were uniform from Cork to Antrim. It does show that north-central Ireland included locally ice-free ground during part of the interval represented by the deposits. The wider British–Irish Ice Sheet was changing quickly. Modern reconstructions begin their detailed sequence around 31,000 years BP because the evidence for its earlier growth is patchy, but they show a major expansion of ice during the closing stages of MIS 3 and its greatest overall volume much later, around 23,000 years BP. Around the date represented here, the landscape was part of a shifting frontier between habitable, exposed terrain and advancing ice.

That frontier matters more than any imagined border. Glaciers altered drainage, crushed and redistributed sediment, and periodically removed the soils and surfaces on which people or animals might have left traces. Rivers and meltwater could scour valleys; frost could fracture exposed rock; snow cover and frozen ground constrained plant growth. A map of a wholly ice-covered Ireland would be too simple, but so would a map of a stable green island. The available record instead indicates a changing mosaic whose local character depended on elevation, shelter, water supply and proximity to ice.

A Cold Freshwater Landscape

The Derryvree deposits preserve plant and insect evidence of a cold northern environment. Freshwater mosses and sedges, together with pollen and other plant remains, point to wet ground, shallow pools and marshy margins. The wider flora is consistent with open, treeless or very sparsely wooded tundra-like country: grasses, sedges, herbs, low shrubs and mosses, rather than the closed woodland that later became familiar in Ireland. Sparse tree pollen in such old deposits cannot be casually turned into proof of local forest, because pollen can travel great distances and may be redeposited.

‘Tundra’ should not suggest an unchanging white desert. Even in severe climates, small differences of slope, drainage and snow cover create distinct habitats. Waterlogged hollows could sustain aquatic and marginal plants; sheltered patches might hold more vegetation than exposed ridges. In summer, short growing seasons could produce useful forage, while winter brought a far harsher setting. The plant assemblage, insects and sediment together support a periglacial wetland landscape: land strongly affected by cold and frost but not necessarily permanently under glacier ice.

This environmental evidence is more secure than any detailed reconstruction of human life. It establishes that freshwater habitats existed at Derryvree during the deposit’s formation. It does not establish what people called the place, whether they saw it, or whether every plant and insect recorded in the deposit lived there at the same moment. Sediments are accumulations. Their value lies in revealing an ecological interval, not a single frozen scene.

Animals at the Atlantic Edge

County Cork provides a complementary, though chronologically broad, record. Castlepook Cave near Doneraile is Ireland’s richest known Pleistocene vertebrate site. Its cave deposits have produced remains of woolly mammoth, giant deer, reindeer, brown bear and spotted hyena, as well as later cold-adapted animals including Arctic fox, wolf and lemmings. Radiocarbon dates from individual bones cover a long span, roughly 45,700 to 19,950 years BP. Accordingly, the assemblage demonstrates that these animals formed part of Ireland’s Ice-Age fauna over many millennia; it cannot prove that all species shared the cave or surrounding countryside in 31,147 BCE.

Nevertheless, Castlepook changes the scale on which this period should be imagined. Ireland was not simply an empty margin beyond the usual range of large mammals. At suitable times it was connected ecologically to the wider north-west European world, allowing mobile animals to reach and occupy its open landscapes. Reindeer were well suited to cold, open terrain; large carnivores and scavengers followed prey and carcasses; caves could serve as dens, traps, repositories or places into which bones were washed. A cave bone is therefore not automatically a record of hunting, and a rich bone collection is not a census of one living community.

The Human Question

The most arresting possibility close to this period is a reindeer femur from Castlepook reported to bear marks consistent with stone-tool butchery and dated to about 33,000 years ago. If the marks are confirmed as human-made, they would indicate that people processed a reindeer in Ireland during the Upper Palaeolithic, vastly earlier than the previously accepted evidence for human activity. Yet the claim requires care. The bone comes from an old cave collection; the cave has a complex history of excavation, water disturbance and animal activity; and the interpretation has circulated more widely than it has been fully published in a peer-reviewed archaeological study.

The prudent conclusion is neither to dismiss the find nor to build a population history upon it. It is a potentially important trace of a brief human visit or episode of carcass processing. It is not proof of a permanent settlement, a continuous population, a camp at Castlepook or a named people occupying Ireland. No stone-tool assemblage, hearth, dwelling, burial or repeated occupation surface securely belongs to this date. Later glacial advances may have destroyed or buried such evidence, but absence of evidence cannot itself demonstrate that people were here.

Should humans have reached the island during a milder or more accessible phase, their likely economy would have been mobile hunting and gathering, exploiting animals and seasonal resources. That is an inference drawn from the wider Upper Palaeolithic world, not a documented Irish way of life. There is no responsible basis for describing households, clothing, language, kinship systems or routes in detail. Nor is there evidence for organised trade: any movement of people or animals across the wider region was shaped by changing terrain, ice and sea level, not by recorded exchange networks.

No Kingdoms, No Recorded Conflict

Political affairs, diplomacy and warfare are beyond the evidence. There were no states, kingdoms, chiefs or territorial boundaries that archaeology can identify in Ireland at this date. A single possible cut-marked bone cannot establish conflict between groups, and animal remains cannot identify human communities. The real regional change was environmental. Ice-sheet growth and abrupt North Atlantic climate variation repeatedly altered the opportunities for plants, animals and perhaps occasional people to enter, remain in or leave Ireland.

Religion, culture and learning are equally inaccessible in the direct evidence. There are no Irish images, ornaments, structures, graves or ritual deposits securely dated to this interval. People, if present, certainly possessed knowledge and social traditions, but none can be reconstructed from a cave bone alone. To invent a belief system or ceremonial landscape would substitute modern storytelling for archaeology.

An Uneven Inheritance

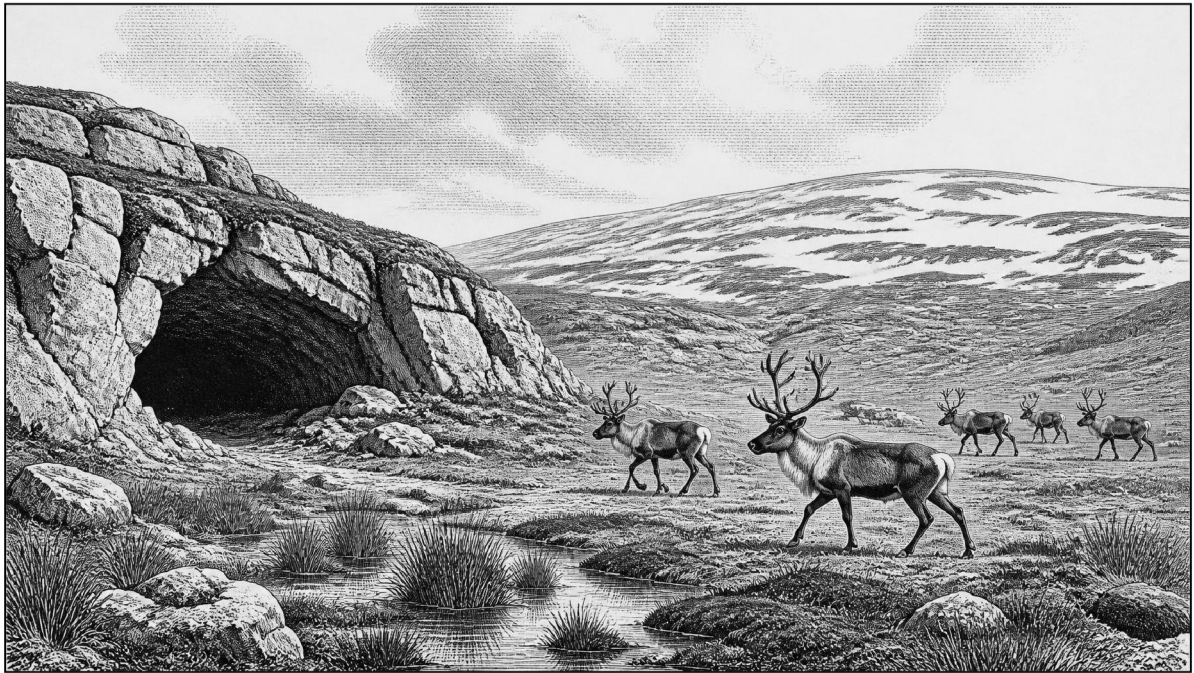
What can be said is both limited and remarkable. Around the broad timeframe labelled 31,147 BCE, Ireland contained cold, open and environmentally varied landscapes rather than later forests and farms. Derryvree preserves a rare freshwater record between episodes of glaciation, while Castlepook preserves evidence for a surprisingly diverse Ice-Age fauna. Together they reveal an Ireland repeatedly remade by ice, water, frost and animal movement.

The most important development was not a battle, dynasty or foundation but the narrowing and reopening of ecological possibilities. The wetland plants of Fermanagh and the cave fauna of Cork are fragments from different settings and long date ranges. Read cautiously, they show that Ireland's deep past was neither blank nor easily recoverable: it was a changing northern landscape whose human story, if there was one at this moment, remains no more than a tantalising trace.

Chapter 055 of 100

31146 BCE

Cave Hyenas at Castlepook^[55]



“31,146 BCE” is a modern calendar label, not a recoverable year in Ireland’s deep past. No written record, annual chronology, named ruler or dated human event exists for this point in time. Indeed, archaeological and environmental evidence cannot ordinarily distinguish one year from the next at such a distance. The responsible approach is to place the date within broad, calibrated Late Pleistocene ranges. In simple calendar arithmetic it lies about 33,095 years before AD 1950, the conventional “present” of radiocarbon dating, but radiocarbon results require calibration and commonly carry uncertainties measured in centuries or millennia.

The best-supported setting is therefore Ireland during Marine Isotope Stage 3, a fluctuating phase of the last Ice Age before the coldest and most extensive phase of the Last Glacial Maximum. Around this notional date, the island was approaching a major environmental transformation. It was not yet safe to imagine every district beneath an unbroken ice sheet, nor to picture a stable, temperate Ireland. The evidence instead indicates a cold, open and changeable north-west European landscape in which ice margins, snow cover, vegetation, animal populations and coastlines altered over long periods.

A Date Within Ranges

The precision of the number should not conceal the imprecision of the evidence. IntCal20, the principal Northern Hemisphere calibration framework, reaches back to 55,000 calibrated years before present, but it does not turn a radiocarbon result of this age into an exact calendar year. The dated materials from Ireland are also not an annual archive. They are bone, organic sediment, pollen, plant remains and glacial deposits, usually preserved or redeposited by natural processes. Their significance lies in the ranges they illuminate.

One particularly important range comes from Derryvree in County Fermanagh. There, freshwater organic silts and fine sands were found between two substantial bodies of glacial sediment in a road cutting through a drumlin. The conventional radiocarbon measurement Birm-166 was reported as 30.5 ± 1.1 radiocarbon thousand years BP. Later modelling has expressed it at approximately 33.5 ± 1.2 thousand calibrated years BP. That range overlaps the broad calendar horizon represented by 31,146 BCE and provides strong evidence that this part of Fermanagh had ice-free ground and freshwater conditions before a later advance of ice.

Derryvree does not supply a diary of the whole island, and its deposits should not be treated as proof that all of Ireland looked alike. It does, however, correct a simplistic image of an eternally ice-covered island. The organic bed records a treeless, cold muskeg or wetland environment: waterlogged ground with sedges, mosses and other hardy plants, rather than woodland or later Irish pasture. Its position beneath later till is equally important. The landscape that sustained that wetland was subsequently overridden, buried and reshaped by glacial action.

Cold Ground, Moving Ice

At this stage, Ireland belonged to the wider British–Irish Ice Sheet system, but that system did not grow everywhere at one pace. A major synthesis of Irish glacial evidence concluded that much of Ireland remained largely ice-free until about 32,000 years ago, followed by thickening and expansion of the last Irish ice sheet. More recent work stresses regional complexity, especially in the north-western marine sector. Derryvree is among the crucial pre-advance constraints: it indicates ice-free conditions in north-central Ireland until roughly 33,500 calibrated years BP, while modelled ice build-up followed much later, about 26,600 calibrated years BP in the relevant Donegal Bay sequence.

Thus, at the approximate horizon of this article, deterioration and eventual glaciation mattered more than any supposed single moment of advance. Uplands may have held persistent snowfields or local ice while lower terrain, valleys and sheltered basins retained cold-season wetlands, exposed soils and patches of vegetation. Frost, seasonal freezing and meltwater would have been powerful landscape-forming forces. Later glaciers scoured bedrock, pushed sediments into drumlins and moraines, and disturbed or destroyed many older deposits. This destructive history helps explain why the archaeological record for Ireland at this age is extraordinarily sparse.

Sea level was lower than today because vast quantities of water were locked in global ice sheets. The present shoreline is therefore a poor guide to the geography through which animals moved. Parts of the continental shelf were exposed at various times, and routes between Ireland, Britain and continental Europe changed as sea level, ice and marine barriers changed. It is reasonable to infer ecological connectivity from the animal evidence; it is not reasonable to draw a neat, permanent land bridge across the Irish Sea for the calendar year 31,146 BCE. The routes available at any particular moment remain debated.

Castlepook's Animal World

The clearest Irish evidence for this broad interval comes from Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. It is Ireland's most important known concentration of last-cold-stage mammal remains. Radiocarbon study has shown that mammals reached Ireland intermittently between at least about 45,000 and 20,000 years ago, well before the island's final glacial

maximum. Castlepook has yielded remains attributed to reindeer, woolly mammoth, giant deer, brown bear, Arctic fox, lemmings and cave hyena, alongside other fauna from deposits with complicated histories.

Some older dates from the cave are revealing rather than exact. Mammoth and hyena material was reported around 33,500 and 34,300 radiocarbon years BP respectively, while later accelerator dates demonstrated that Castlepook material spans very different phases of the Late Pleistocene. A giant-deer astragalus, for example, dated to $32,060 \pm 630$ radiocarbon years BP, whereas an Arctic-fox bone and lemming remains belong to later cold episodes. The lesson is methodological as well as historical: Castlepook is a rich archive, but not a sealed floor occupied by all species at once.

Cave hyenas are especially striking. Their occurrence in Ireland is known securely from Castlepook, and gnawed bones show that large carnivores helped accumulate or modify cave deposits. A hyena den is not evidence of human settlement, but it demonstrates that Ireland could support a food web containing substantial herbivores, scavengers and predators. Reindeer point to open, cold environments; lemmings and Arctic fox reinforce the picture of severe conditions in at least some phases. Mammoth, giant deer and bear remind us that the island's Ice Age fauna was far more varied than its later historic fauna.

A 2026 sedimentary ancient-DNA study, currently available as a preprint rather than a final peer-reviewed article, adds a further line of evidence. It detected DNA from twelve ancient taxa at Castlepook and recovered mitochondrial sequences from Irish cave hyenas and woolly mammoths. The authors interpret these results as support for faunal links between Ireland and wider Eurasian populations before the Last Glacial Maximum. That is a valuable inference about connectivity, though it does not establish exactly when, how often or by which physical route every species arrived.

The Human Question

Human history at this date is possible, but not securely demonstrable in the way that the animal and environmental history is. A reindeer femur from Castlepook has been reported as dating to about 33,000 years ago and bearing a deep mark interpreted by palaeozoologist Ruth Carden as the result of butchery with a sharp stone tool. If this interpretation is confirmed, it would be evidence that an Upper Palaeolithic person handled a reindeer in Ireland in the broad period close to the date considered here.

That conditional language matters. The bone is a major research lead, not proof of a permanent Irish population, a settlement, a named migration or continuous occupation. Castlepook has not produced a securely associated stone-tool assemblage, hearth, hut floor, human burial or stratified camp of this age. Marks on bone must be distinguished carefully from damage caused by carnivores, trampling, excavation or other processes. The generally secure early evidence for human activity in Ireland remains much later: the cut-marked brown-bear patella from Alice and Gwendoline Cave in County Clare, dated to about 12,800–12,600 calibrated years BP.

Accordingly, politics, diplomacy, warfare, religion, language, learning and art cannot responsibly be described for Ireland in 31,146 BCE. There are no identifiable communities through which to reconstruct them. Nor can trade be inferred merely because animals or perhaps people reached the island. The most that can be said is that, if people briefly visited, they would have belonged to mobile Upper Palaeolithic hunter-gatherer worlds already established elsewhere in north-west Europe, where stone technology, hunting knowledge, clothing and long-distance social ties were important. Those wider comparisons are context, not direct evidence for Irish camps.

What Everyday Life Cannot Yet Show

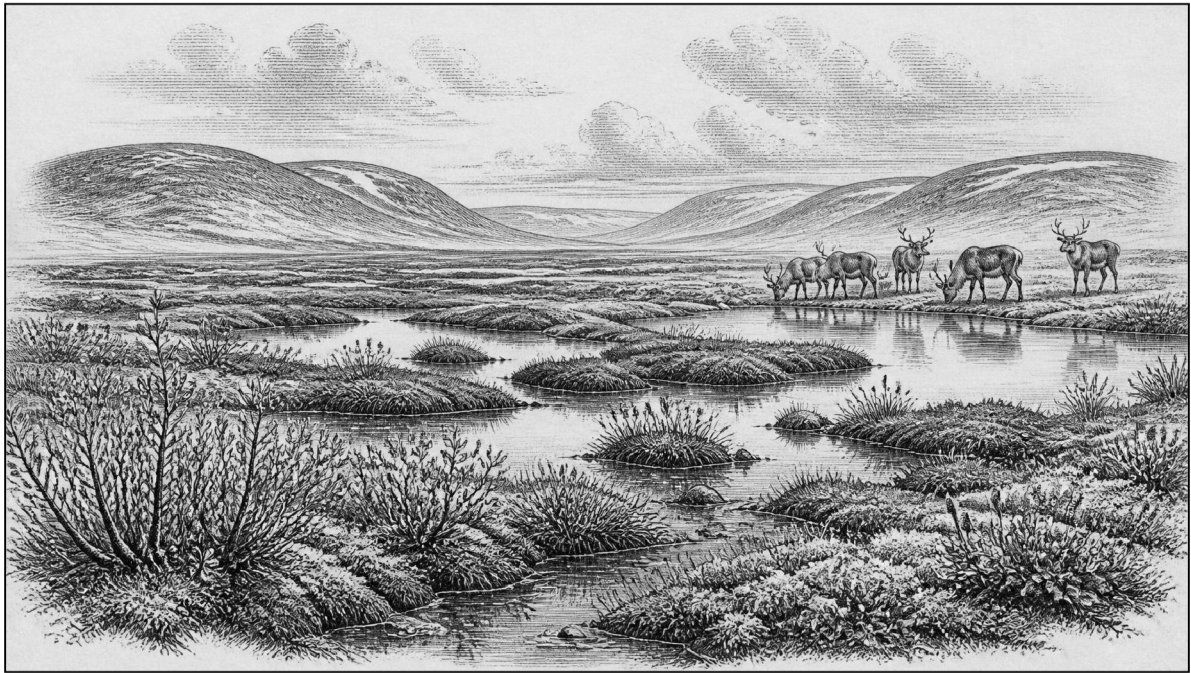
No settlement pattern can presently be mapped for Ireland at this horizon. There is no basis for assigning population numbers, houses, family groups, food-sharing rules, ritual places or seasonal territories. A visitor might have followed animal movements, sheltered in caves or passed through a coastal corridor now drowned or altered by later ice; each remains an hypothesis. The absence of evidence is partly a product of preservation. Ice, meltwater, later soil formation and rising seas have removed or concealed the places where short-lived camps would most likely have stood.

Yet the record is not silent. Derryvree preserves an ice-free freshwater wetland within a cold treeless landscape. Castlepook preserves animals that demonstrate a connected and occasionally habitable Irish environment before full glacial conditions. Together they show an Ireland neither timelessly empty nor historically knowable in the ordinary sense: a shifting Pleistocene edge-land, rich in ecological evidence but poor in direct traces of people. Its most important development was environmental. The approaching expansion of ice would transform habitats, restrict animal movement and bury much of the physical evidence from which this early chapter of Irish history must be reconstructed.

Chapter 056 of 100

31145 BCE

Derryvree's Muskeg Flora^[56]



Modern calendar-year precision is not available for Ireland in 31,145 BCE. No one on the island recorded a year, and no deposit can be dated closely enough to identify a particular twelve-month interval so far back. This modern label falls at roughly 33,100 years before AD 1950, in the Late Pleistocene and Marine Isotope Stage 3. The responsible subject is therefore not a narrated year of rulers, battles or migrations, but a broad, cold phase known through a small number of sediments, fossils and cave collections.

The closest and most revealing Irish evidence is the Derryvree deposit near Maguiresbridge in County Fermanagh. There, roadworks in 1969 cut through a drumlin and exposed freshwater silts, fine sands and organic matter sandwiched between two thick sheets of glacial till. The sequence records an important order of events: glacier ice had laid down the lower till; an ice-free interval then allowed pools, plants and sediment to accumulate; and a later glacier buried the wetland beneath a new layer of till. It is one of Ireland's rare surviving windows into an interval otherwise badly damaged or concealed by later ice.

A Date Within a Range

The organic material from Derryvree produced the conventional radiocarbon determination BIRM-166: 30,500 radiocarbon years BP, with a substantial uncertainty of +1,170/-1,030 years. A radiocarbon age is not a calendar age. Carbon-14 concentrations in the atmosphere have changed through time, and measurements must be compared with an internationally maintained calibration curve. At this depth in time, both the laboratory uncertainty and the shape of the calibration curve create wide possible calendar ranges rather than a date fit for an annual chronicle.

Published discussions place the Derryvree freshwater interval broadly at about 36,900–31,700 calibrated years BP, or approximately 34,950–29,750 BCE when rendered in the modern BCE system. The assigned year of 31,145 BCE lies inside that broad horizon, but it cannot be attached to a particular plant, animal, person or episode at the site. Nor should the date be treated as the beginning or end of the deposit. Derryvree illuminates a landscape that existed over many centuries or millennia; it does not provide a diary entry.

Water Between the Tills

The most immediate picture is of shallow freshwater in a severe, open environment. Pollen, plant macrofossils, mosses and insect remains from Derryvree indicate a treeless periglacial muskeg: waterlogged ground with pools, saturated vegetation and seasonally frozen soils, rather than a blanket of permanent ice or the wooded landscape familiar from later Irish prehistory. Sedges and grasses grew around wet hollows. Mosses were plentiful. The fossils include bogbean, mountain-avens, dwarf willow, Arctic-alpine clubmoss and water-milfoil, plants whose combined presence speaks of cold ground, low vegetation and standing or slow-moving freshwater.

That combination matters because it corrects two tempting simplifications. First, Ireland was not necessarily an uninterrupted white wilderness during every moment of the Ice Age. At Derryvree, a freshwater ecosystem plainly developed between glacial advances. Secondly, this was not a benign temperate refuge. The vegetation was low, sparse and exposed, with a short growing season and winters sufficiently hard to favour plants adapted to Arctic or alpine conditions. Insects strengthened the interpretation of wet, mossy ground with open water and abundant decomposing plant matter.

Such evidence gives a local environmental reconstruction, not a complete map of the island. Fermanagh's basin, geology and drainage differed from the limestone country of Munster, the western seaboard and upland districts. Still, the Derryvree succession shows that parts of Ireland supported living wetland communities during a climatically unstable portion of MIS 3. Its very preservation beneath a drumlin is an accident of geological history: later ice both sealed the deposit and made its eventual discovery possible.

Cold Country, Changing Ice

At this time the British–Irish Ice Sheet was not yet at its best-established late maximum. Large reconstructions indicate major growth and reorganisation of ice after about 31,000 years BP, while the most extensive Last Glacial Maximum coverage of Ireland and its continental shelf came later, broadly around 27,000–23,000 calibrated years BP, with important regional differences. Around the notional date considered here, conditions were consequently variable: ice may have occupied some highlands and sectors while open, cold terrain and wetlands existed elsewhere.

Greenland ice-core records show that the wider North Atlantic climate during MIS 3 was marked by abrupt swings between relatively milder interstadial phases and colder stadial conditions. It would be rash to transfer an ice-core temperature directly to Fermanagh, but Ireland lay within the North Atlantic climate system and its glaciers, vegetation and watercourses responded to those wider shifts. The Derryvree deposit belongs to this restless world of advancing ice, thawwater, frost and ecological adjustment. The later ice advance was not a distant abstraction: it eventually covered the local wetland, compacted and protected its sediments, and helped erase much other evidence of its age.

Sea level was much lower than it is today, exposing parts of the continental shelf around Ireland. Yet lower water does not automatically prove a usable land bridge at a particular date. Ice margins, rivers, marshes, cold seas and changing shorelines all affected movement, while the precise configuration of land and ice changed through time. It is safer to say that Ireland formed part of a transformed north-west European region, not to draw a confident route for animals or people across a map reconstructed at false precision.

Animals in the Cave Record

Southern Irish caves demonstrate that Late Pleistocene Ireland sustained a fauna very different from that of the modern island. Castlepook Cave near Doneraile, County Cork, is especially important. Its extensive bone collection has yielded remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Together these finds establish that cold-adapted and open-country animals reached Ireland during the long pre-Last Glacial Maximum interval.

But Castlepook is not a census for 31,145 BCE. Cave deposits are complex. Carnivores can drag carcass parts into a den; water, excavation and later disturbance can move bones; and a cave collection may amalgamate animals that lived centuries or thousands of years apart. The Irish Quaternary Fauna Project demonstrated the value of re-dating old collections precisely because earlier assumptions about their age and association were often insecure. Individual bones document the presence of an animal at some point; they do not automatically prove that every named species grazed or hunted together on one Irish hillside.

Nevertheless, the cave record makes the Derryvree landscape easier to envisage in broad terms. Reindeer and lemmings accord with the open, cold conditions implied by the Fermanagh flora. Mammoths and giant deer indicate that substantial herbivores could use Irish landscapes during parts of the Late Pleistocene. Spotted hyaena, wolves and bears remind us that caves were not neutral containers but places used by animals as refuges, dens or scavenging sites. Predation and scavenging were certainly part of the ecosystem, though the evidence cannot reconstruct a particular encounter.

The Human Question

One Castlepook object gives this period exceptional archaeological interest: a reindeer femur reported to bear a deep mark interpreted as having been made by a sharp stone tool while the bone was fresh. County Cork heritage material presents the specimen as a Palaeolithic find of about 31,000 BC and connects it with the possibility of reindeer butchery. If the mark is securely human-made and contemporary with the animal's death, it would be evidence that people reached Ireland far earlier than the island's long-established post-glacial settlement record.

The distinction between possibility and proof is essential. The specimen is a single bone from an old cave collection, not a sealed occupation floor. No securely associated hearth, stone-tool assemblage, dwelling, burial, repeated group of butchered bones or food-processing area has been found in Ireland for this age. The radiocarbon date is the age of the animal bone, not an annual date for the incision. A cave used by carnivores also complicates the route by which the bone entered it. The mark is significant proposed evidence of human activity, but it cannot establish a resident population, a settlement, a named culture, language, kinship system or continuous occupation.

If people did visit, the most cautious interpretation is of a short-lived presence by mobile Upper Palaeolithic hunter-gatherers moving through a wider north-west European world, perhaps following game or exploiting a carcass. Even that remains an interpretation rather than an observed fact. There is no basis for imagining a village, agriculture, livestock, pottery, metalworking or monument building. Nor is there evidence for local manufacture, trade networks or regular maritime exchange. Stone was the likely material for any tool responsible for the reported cut, but no tool can yet be tied to the bone.

No Politics, No Recorded Religion

Political affairs, diplomacy and organised warfare cannot responsibly be described for Ireland around this date. There are no states, rulers, frontiers, treaties, written names or archaeological signs of institutions from which to infer them. Likewise, no shrine, burial, artwork, musical instrument or deliberate symbolic deposit of this age is known from Ireland that can demonstrate religious practice or learning. The absence of evidence is not proof that visiting people lacked beliefs, stories, skills or social obligations; it means that the Irish record cannot recover them.

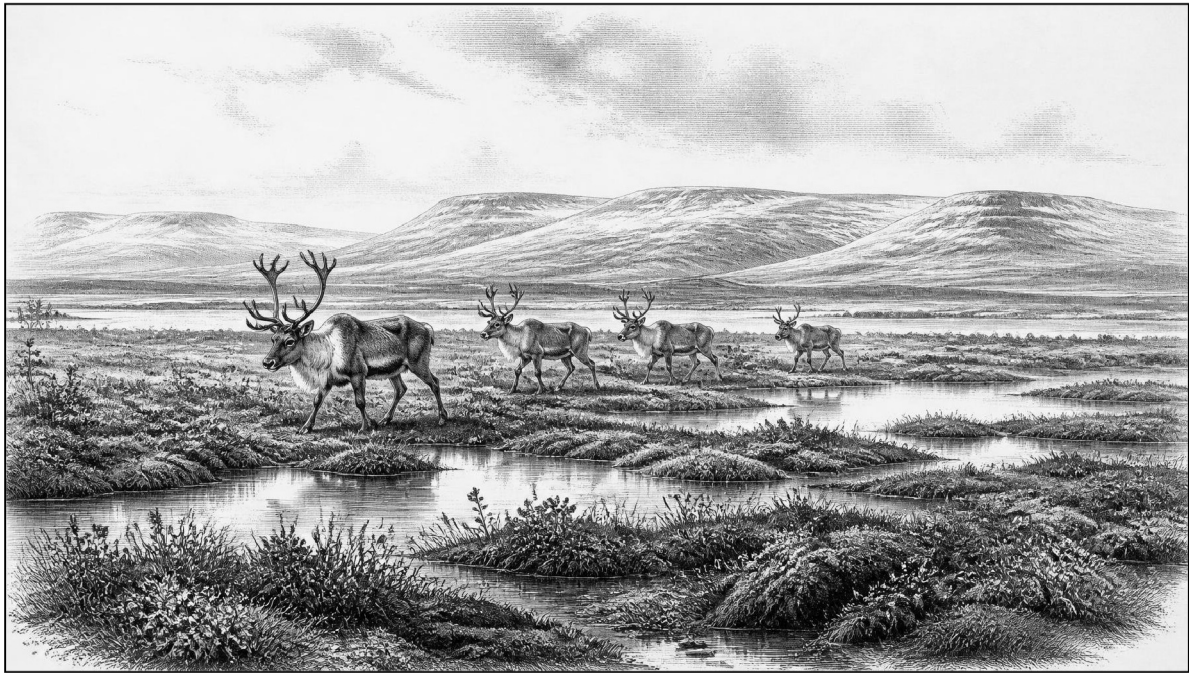
Everyday life is best approached through environmental constraint. An animal or human surviving in this country faced exposure, rapid seasonal change, limited woody fuel, patchy forage and the dangers of boggy ground, cold water and large predators. The wetland itself was productive on a small scale, supporting plant growth and invertebrate life, while the wider open terrain could sustain grazing animals. Yet this was a precarious ecology, repeatedly vulnerable to climatic deterioration and ice advance. The subsequent glaciation was a regional change of the greatest importance, remaking terrain and destroying or burying traces of earlier life.

The historical importance of 31,145 BCE lies in this disciplined uncertainty. Derryvree's buried muskeg proves that an Irish freshwater tundra ecosystem existed within a broad cold-stage interval. Castlepook proves that a remarkable Pleistocene animal world reached the island. The marked reindeer femur raises, but does not settle, the possibility of a human visit. Together they replace an empty Ice Age Ireland with a richer picture—one grounded in silts, seeds, insects and bones, and careful about everything those fragmentary witnesses cannot say.

Chapter 057 of 100

31144 BCE

Maguirebridge's Sealed Wetland^[57]



“31,144 BCE” is a modern label, not a date from which Ireland preserves a calendar, a named community, or an event record. It falls roughly 33,094 years before the conventional radiocarbon reference year of AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), an unstable middle phase of the last Ice Age. Modern calendar-year precision is not available. The responsible account of Ireland at this point must therefore work with broad calibrated ranges, stratified deposits and fossil assemblages, distinguishing what they demonstrate from what they merely make plausible.

A Date Within a Range

The closest Irish environmental archive is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks exposed fine sands, freshwater silts and organic sediment trapped between two layers of till, the unsorted debris deposited by glacier ice. The sequence establishes a clear order: ice had affected the site; an interval followed in which water, plants and animals occupied the locality; then later ice buried the evidence. It does not identify a particular year, season or human generation.

Organic material from the Derryvree deposits produced a conventional radiocarbon age of about 30,500 years BP, with a substantial uncertainty. Revised calibration curves convert such measurements into calendar-age probability ranges rather than exact answers. The deposit has commonly been placed broadly within about 36,900–31,700 calibrated years BP, or approximately 34,950–29,750 BCE. The requested year lies within that span, but cannot be assigned to a particular layer, pool or episode in the sequence. It is best treated as a point within the life of a cold-stage landscape, not as a historical anniversary.

Fresh Water Between Glacial Advances

Derryvree is important because later ice sheets destroyed or concealed much older ground surface across Ireland. Here, organic material survived beneath a drumlin. Pollen, plant macrofossils, mosses and insect remains indicate a treeless, periglacial wetland: a landscape shaped by severe cold, frost action and a short growing season, but not permanently entombed beneath ice at that particular locality. Fresh or slow-moving water supported pools and wet margins during at least part of the year.

The evidence is strongest for an open mosaic rather than for a uniform plain. Sedges, grasses, herbs and mosses grew around waterlogged ground; low Arctic-alpine plants included indicators such as lesser clubmoss. The deposits have been described as a muskeg environment, meaning wet, organic-rich ground with shallow water and mossy or sedgy vegetation. There was no oak, hazel or ash woodland of the sort familiar from later prehistoric Ireland. Sparse tree pollen in cold-stage sediments cannot safely be treated as proof of nearby forest: pollen may travel long distances or be redeposited.

Interpretation must remain local. Derryvree demonstrates that this part of Fermanagh was ice-free long enough for a freshwater ecosystem to develop between glacial episodes. It does not prove that every Irish valley, coast and upland was open at once. The island lay within a changing north-west European climatic zone, where ice masses, sea level, drainage and animal ranges altered repeatedly. The later maximum of the British–Irish Ice Sheet came after this broad horizon, principally around 27,000 years ago and afterwards, but substantial earlier ice growth and regional advances are also recorded. Ireland was not moving steadily towards a single, simple freeze; its environment was geographically varied and chronologically unsettled.

An Open-Animal Landscape

Caves in southern Ireland supply a second, very different line of evidence. Castlepook Cave, near Doneraile in north County Cork, has yielded remains attributed to several parts of MIS 3, including woolly mammoth, giant deer, reindeer, brown bear, wolf, fox, hare, lemmings and spotted hyaena. The list evokes a strikingly non-modern fauna, but it must not be made into a single scene. Cave deposits can accumulate over long periods, and nineteenth- and early twentieth-century excavations often removed bones from complex contexts. Modern redating has shown that some earlier determinations required major revision.

Even with that warning, the faunal evidence supports the broad environmental picture supplied by Derryvree. Ireland could support, or be reached by, cold-adapted grazers and browsers, predators and scavengers during suitable intervals of the Late Pleistocene. Reindeer and lemmings signal open northern habitats; mammoth and giant deer point to large herbivores moving through productive grass-herb country; spotted hyaena indicates a formidable carnivore and bone collector. Their presence need not mean that every species occupied every district simultaneously. It does show that Ireland was ecologically connected, intermittently, to wider north-west European animal populations.

Low sea levels altered the geography of the surrounding seas, but the precise opportunities for movement into Ireland at this date remain difficult to reconstruct. Animals may have crossed exposed or ice-influenced routes at some stages, while water, unstable ice and changing coasts impeded travel at others. Fossils record arrivals and survival, not the exact routes taken. There is no basis for depicting a dependable road into the island or a permanent land bridge available throughout the period.

The Human Question

Human history at this date is necessarily cautious. A reindeer bone from the old Castlepook collections, dated to roughly 33,000 years ago, bears marks interpreted by some researchers as cuts made during butchery with a stone tool. If that interpretation is confirmed, it would indicate that one or more Upper Palaeolithic people handled a reindeer carcass in Ireland during the wider period relevant here. It would be an important trace of a visit or brief activity, not proof of a settled population.

The qualification matters. The bone's radiocarbon age dates the animal's death, not automatically the cutting; it cannot identify the maker, establish whether the animal was hunted locally, or reveal how long people stayed. The cave collection also has complicated excavation and depositional histories. There is no securely dated house, hearth, stone-tool scatter, burial, campsite or settlement plan from Ireland that can be assigned to 31,144 BCE. Nor is there evidence for an enduring population continuous through the later full glacial conditions.

If people did enter Ireland during a milder or more accessible interval, their likely way of life can only be inferred from Upper Palaeolithic comparisons elsewhere in north-west Europe. Small, mobile hunter-gatherer groups would have required food, fuel, stone, hides, shelter and safe routes through a seasonal landscape. Such a reconstruction is plausible, but it is not direct evidence for a camp at Derryvree or Castlepook. Ireland's evidence presently supports transient human presence as a possibility, not a detailed social map.

No Politics, Farms or Monuments

There were no known kingdoms, chiefs, borders, diplomatic alliances or wars in the historical sense. No written language, political institution or named people can be recovered from the evidence. Likewise, nothing supports claims for farming, domesticated stock, fields, pottery, metalworking, built monuments or long-distance commercial exchange. These belong to much later Irish prehistory. The economy visible here is ecological rather than political: plant growth in short summers, animal movement across open ground, carnivore activity, water collecting in hollows, and glacial processes reorganising the terrain.

Religion, art, learning and oral tradition are almost wholly beyond recovery for Ireland at this depth of time. It would be wrong to infer shrines, myths or ritual practices from an animal bone or wetland pollen record. People elsewhere in Upper Palaeolithic Europe certainly had complex cultural lives, but that wider fact cannot fill Ireland's evidential silence. At most, a possible butchered bone suggests practical knowledge of animal carcasses and tools; it says nothing reliable about language, kinship, belief or ceremony.

What This Moment Means

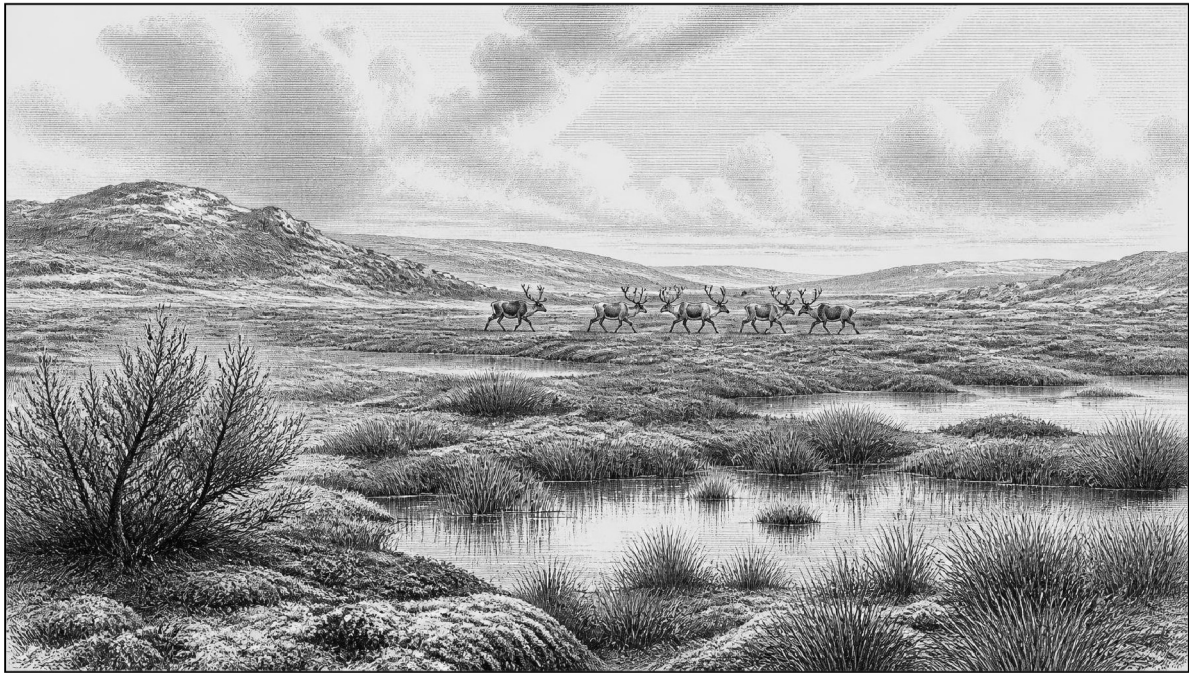
The main Irish development around this notional year was environmental instability. At Derryvree, an ice-free freshwater habitat formed between glacial advances and preserved an unexpectedly rich sample of cold-stage life. In Cork, caves retained fragmentary testimony to animal communities that no longer exist in Ireland. Together, the sites show that the island was neither a timeless blank nor a familiar green landscape awaiting later settlers. It was a changing, open and often severe Ice Age world.

Its historical lesson is one of limits as well as discovery. Deposits can reveal water, vegetation, insects and animals; they can sometimes preserve a disputed sign of people. They cannot supply a diary for 31,144 BCE. The most defensible picture is therefore precise about the evidence and restrained about interpretation: cold wetlands in Fermanagh, varied faunal ranges in southern caves, episodic ice expansion, and—at most—the possibility of brief human incursions into a landscape repeatedly remade by climate.

Chapter 058 of 100

31143 BCE

Cork's Pre-Ice Reindeer Cutmark ^[58]



“31,143 BCE” is a modern chronological label, not a year that anyone in Ireland could have named or recorded. At this depth of time there were no written calendars, dated settlements, rulers or events on the island. Calendar-year precision is unavailable: the label corresponds only approximately to 33.1 thousand calibrated years before present, where “present” conventionally means AD 1950. The responsible history of Ireland at this point is therefore not an annual chronicle, but a reconstruction from cave bones, buried wetland sediments, pollen, insects, mosses, landforms and radiocarbon measurements with wide uncertainty ranges.

A Late Pleistocene Interval

The notional date falls in the later part of Marine Isotope Stage 3, a climatically unstable phase of the last Ice Age. It preceded the fullest expansion of the last British–Irish Ice Sheet, which reached its major maximum only later, broadly during the period from about 27,000 to 23,000 calibrated years before present in Irish waters and on the surrounding shelf. Ireland was not yet simply a country entombed beneath a single unbroken ice sheet. Conditions differed sharply by region and changed repeatedly through time; ice margins, periglacial ground, wetlands, caves and more open terrain all belonged to a changing northern Atlantic landscape.

This distinction matters. Later glaciation eroded, transported and buried much evidence from earlier periods, so apparent absences in the archaeological record cannot automatically mean that people or animals were absent. Equally, the survival of a bone or sediment bed does not prove that its conditions extended across the whole island at one moment. The evidence offers local windows, not a complete map. Its strongest value lies in establishing what kinds of environments and animals were possible in Ireland over broad spans, rather than supplying a precise scene for a particular modern calendar year.

Derryvree's Buried Wetland

The clearest Irish environmental evidence relevant to this approximate horizon was found at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 exposed organic silts and fine sands caught between two thick tills within a drumlin. The deposit produced a conventional radiocarbon determination of 30,500 $\pm$ 1,170/–1,030 radiocarbon years BP. Later calibration places it broadly between about 36,900 and 31,700 calibrated years BP, a range that includes the notional date considered here. It is not a deposit laid down on one day, one season or one named year; it accumulated through an interval.

Its plant and animal traces nevertheless provide unusually direct evidence for the character of one Irish landscape. Pollen, seeds, mosses and beetle remains indicate open, treeless tundra or muskeg: a wet, cold mosaic of sedges, herbs, mossy ground and shallow freshwater pools. Plants associated with milder woodland should not be inferred from the few poorly preserved grains sometimes recovered in such deposits. The stronger signal is of sparse vegetation, prolonged winter cold and ground shaped by freezing and thawing. Derryvree was not modern green Ireland in miniature, but neither was it necessarily an empty white desert. It was a periglacial wetland able to sustain specialised plant and insect communities.

The deposit also gives an important warning about regional change. It lies between tills, demonstrating an ice-free interval at that location before later ice overran and sealed the wetland beneath glacial sediment. In south-west Ireland, speleothem records from Crag Cave likewise show episodic formation during warmer phases of MIS 3, when liquid water could circulate underground. Together, these archives support an interpretation of repeated climatic shifts rather than a simple, uninterrupted descent into maximum glaciation. They do not establish that Fermanagh and Kerry experienced identical weather, vegetation or ice cover at exactly the same time.

The Castlepook Faunal World

County Cork supplies the other principal body of evidence. Castlepook Cave, near Doneraile and also known as Mammoth Cave, produced an exceptionally important collection of Pleistocene animal remains during antiquarian excavations between 1904 and 1912, with further finds later. The wider cave assemblage includes reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. These animals were not necessarily all contemporaries, and their bones do not represent one intact food web. Cave deposits may combine material brought in by predators, water, natural deaths, collapse and excavation over many millennia.

Even with that caution, Castlepook establishes that Ireland formed part of the wider north-west European world of cold-adapted large mammals during the Late Pleistocene. Reindeer are particularly evocative because their presence is compatible with open country and seasonal movement across broad grazing landscapes. Mammoth and giant deer point to substantial herbivore resources, while hyaena and wolf remind us that people, if present, would not have held exclusive command over caves or carcasses. Caves could be dens, traps, shelters or repositories; they should not casually be called human homes.

Modern redating has also changed this evidence. Improved pretreatment and ultrafiltration techniques showed that several radiocarbon measurements obtained from Irish cave bones in the 1990s were too young. At Castlepook, some replacement determinations proved between roughly 5,000 and 12,000 radiocarbon years older than the earlier results. This is a major methodological lesson for any account of 31,143 BCE: dates are evidence produced by particular samples and methods, not permanent facts immune to revision. The faunal record is secure in its broad significance, but individual dates and associations require continual testing.

The Reindeer Femur Question

The most consequential possible human evidence for this broad period is a reindeer femur from Castlepook. It has been publicly presented as approximately 33,000 years old and as bearing a deep surface modification interpreted by zooarchaeologist Ruth Carden as a cut or chop made with a sharp stone implement while a carcass was processed. If that interpretation is confirmed, it would indicate human handling of a reindeer in Ireland during the Upper Palaeolithic, dramatically earlier than the securely documented post-glacial settlement record. It would be an important discovery, but it is not a licence to populate the island with imagined tribes.

The limits are as important as the possibility. The bone came from an old collection, not a modernly excavated occupation surface with a fully recorded stratigraphy. A radiocarbon determination dates the death of the animal, not automatically the moment when a mark was made, and recognising a stone-tool cut is a separate taphonomic judgement. No associated hearth, lithic assemblage, dwelling, burial, repeated camp sequence or securely contemporary human bone has established a resident community in Ireland at this date. The cautious conclusion is that the femur may preserve evidence of a brief human visit or episode of carcass processing; it does not prove a permanent population, a migration route or biological descent from any later Irish people.

What Cannot Be Recovered

There is no evidence from which to reconstruct political authorities, diplomacy, warfare, laws, language or named communities in Ireland around this point. Nor is there material support for attributing a religion, art style, monument tradition or system of formal learning to possible visitors. If people did reach the island, the most that can responsibly be inferred is a small, mobile group capable of using a sharp stone edge and exploiting animal resources in a difficult environment. Whether they hunted the reindeer, encountered an already dead animal, removed meat, hide, sinew or marrow, or transported the bone into the cave cannot be decided from the surviving object.

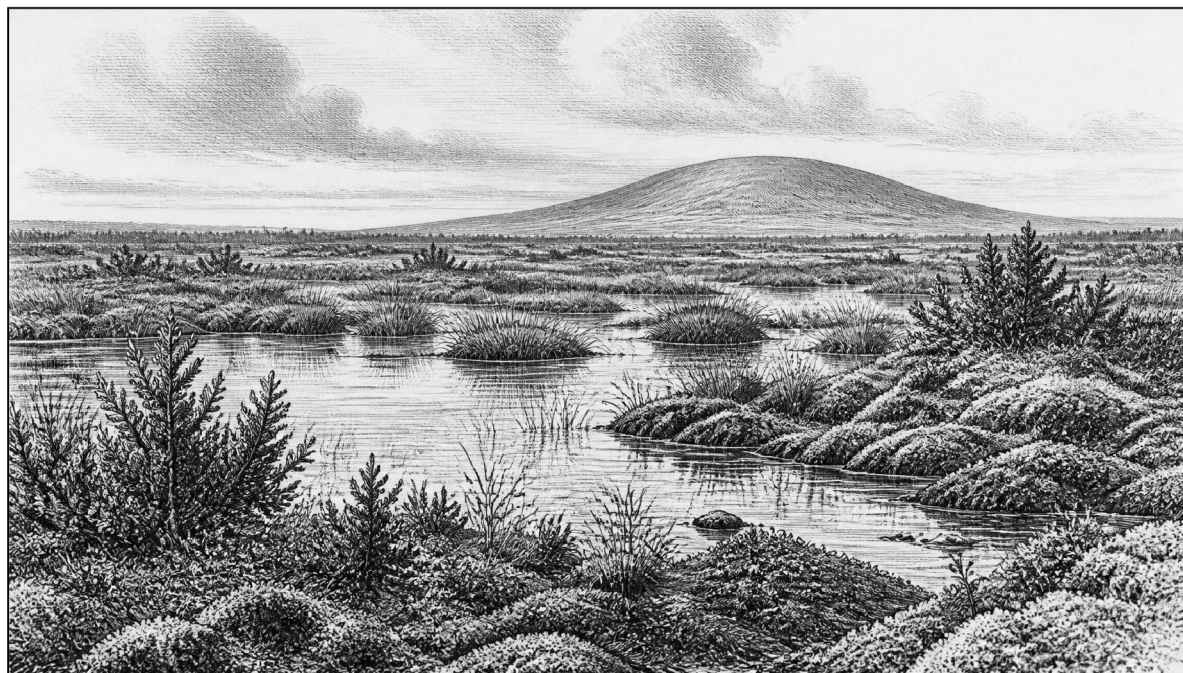
Economy and trade must be described with equal restraint. A mobile foraging economy is a reasonable conditional interpretation if the cutmark is human-made, but there is no evidence here for settled farming, exchange networks, seafaring technology or regular commerce. Ireland's precise relationship to Britain and the continental landmass at this time was governed by changing sea levels, exposed shelves, ice and coastal geography, yet no demonstrated route can be attached to the femur. The archaeological record preserves neither a boat nor a crossing party.

What can be said is both modest and remarkable. Around the broad interval represented by 31,143 BCE, parts of Ireland contained cold, open habitats with freshwater wetlands and substantial Ice Age fauna. Derrynree records a periglacial ecological community later sealed by ice; Castlepook preserves a long, complicated animal archive and a potentially transformative sign of human action. The story is not one of kings, settlements or a dateable event. It is Ireland before recorded history, when climate, ice and animal movement shaped the available world, and when one marked reindeer bone raises a question that further excavation and scientific analysis may yet answer.

Chapter 059 of 100

31142 BCE

BIRM-166's Arctic Pools^[59]



Modern calendar-year precision is not available for Ireland in 31,142 BCE. No calendar, written source, settlement layer or identifiable event can be tied to that numbered year. It is best treated as a modern point within the Late Pleistocene, approximately 33,091 calendar years before AD 1950, during Marine Isotope Stage 3 (MIS 3), an unstable phase of the last glacial cycle. The nearest relevant Irish evidence is dated in broad ranges, not years. Most importantly, organic freshwater sediments at Derryvree near Maguiresbridge, County Fermanagh, produced the conventional radiocarbon determination BIRM-166: 30,500 +1,170/-1,030 radiocarbon years BP. With calibration, that is broadly about 36,900–31,700 calendar years BP. The requested date falls within that large range, but this does not mean that the deposit records a particular day, season or community in 31,142 BCE.

A Wetland Beneath a Drumlin

Derryvree was revealed by roadworks in 1969, when a cutting passed through a drumlin: a streamlined hill made largely of debris deposited by glacier ice. Beneath an upper till, and above an older till, investigators found fine sand, silt and organic-rich freshwater deposits. This sequence is the crucial fact. At least locally, ice had withdrawn or ceased to occupy the ground long enough for standing or slow-moving water, sediment and vegetation to accumulate. Ice later returned or expanded across the site, sealing the wetland below a new blanket of till.

The Derryvree deposit is therefore neither a picture of a uniformly ice-free Ireland nor evidence for a mild interlude. It documents a cold, periglacial environment between glacial episodes in one part of Fermanagh. Its pollen, plant macrofossils, mosses and insect remains point to open, treeless ground and wetland habitats. Grasses, sedges, juniper and herbaceous plants occurred; moss-rich ground and shallow

pools contained organic matter that could be preserved beneath later ice. The old term “muskeg”, used by the original investigators, conveys an uneven landscape of waterlogged vegetation, peat-like mud, pools and saturated ground rather than a modern bog.

This is exceptionally valuable evidence because the later British–Irish Ice Sheet eroded, displaced or buried so much older ground surface. Derryvree survived as a small environmental archive caught between tills. It permits a responsible reconstruction of a cold northern Irish wetland during the wider period, but it cannot establish the weather in the named year, the precise duration of the wetland, or whether comparable terrain covered every Irish region.

Cold Ground, Living Water

The landscape implied by Derryvree was severe but not lifeless. In the growing season, low plants could exploit brief thawed conditions around freshwater. Sedges and grasses offered cover and food; mosses colonised persistently damp surfaces; dwarf shrubs and scattered juniper marked better-drained patches. In winter, freezing conditions and snow would have sharply limited plant growth. The evidence is consistent with tundra-like, strongly seasonal country, not woodland, pasture or farmland.

South-west Ireland supplies a complementary, though differently dated, climatic record. Uranium-series dates from speleothems in Crag Cave, County Kerry, show that the last glacial period was interrupted by episodes in which liquid water again infiltrated shallow caves and calcite could grow. Such growth indicates intervals less persistently frozen than full stadial conditions. It does not date a Derryvree pool directly, but it confirms that Irish climates during MIS 3 could alter markedly on millennial scales. A single label such as “Ice Age” should not conceal that variability.

There were no cultivated fields, domesticated stock, roads, harbours or managed woodland. Nor can the Derryvree evidence reveal language, kinship, law or social rank. It does reveal the environmental foundations upon which any animal or human visitor would have depended: accessible water in some seasons, sparse vegetation, exposed ground and the hazards of frost, wind and changing ice margins.

Castlepook’s Uneven Faunal Record

At the opposite end of the island, Castlepook Cave near Doneraile in County Cork provides the principal animal archive relevant to this deep period. Early excavators recovered a large collection of bones from its limestone passages and chambers, giving the cave its alternative name, Mammoth Cave. Woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena are among the animals represented. Together they show that Ireland was, at intervals before the Last Glacial Maximum, connected ecologically to the wider north-west European world sufficiently for large mammals and predators to reach it.

That conclusion needs careful limits. A cave bone collection is not a census of a single valley in a single year. Carnivores may drag carcass parts into dens; water, frost, collapse and early excavation can move material; and the remains accumulated over a long period. Modern radiocarbon work has demonstrated that several older Irish cave dates required revision, with some Castlepook animals proving substantially older than previously supposed. The fauna should therefore not be imagined as one perfectly contemporaneous herd pursued by one set of predators.

Nonetheless, reindeer are especially plausible inhabitants of open, cold country, while mammoth and hyaena underline how unfamiliar this ecology was beside the later Irish fauna. Their presence speaks of mobility across changing landscapes, not of an enduring local ecosystem unaffected by climate. As ice

advanced and retreated, suitable habitats and movement corridors would have changed repeatedly. Some populations may have vanished locally long before the ice sheet attained its later maximum extent.

The Human Question

A reindeer femur from Castlepook is the most important, and most disputed in implication, artefact-like trace for this period. It has been reported as carrying a deep mark interpreted by zooarchaeologist Ruth Carden as an incision made with a sharp stone edge while fresh bone was being processed. Public heritage material dates the bone broadly to about 31,000 BC. If the mark is confirmed as human-made and related to the animal's age, it would be evidence that people handled a reindeer in Ireland in the Upper Palaeolithic, vastly earlier than the formerly accepted archaeological record.

Even then, the conclusion must remain narrow. The dated bone records when the animal lived, not automatically the exact time at which it was cut. The original finds came from antiquarian excavation rather than a modern, undisturbed occupation surface. No securely associated hearth, stone-tool assemblage, built shelter, burial, ornament or repeated butchery floor has established a camp at Castlepook of this age. The bone cannot show whether people killed the animal, scavenged it, removed meat or sinew elsewhere, or whether a carnivore later carried the limb into the cave.

Accordingly, permanent settlement cannot responsibly be claimed for Ireland in 31,142 BCE. A transient visit by mobile hunter-gatherers is possible if the cut-mark interpretation stands; an established population, seasonal round, boat technology, clothing style or social identity cannot be recovered from this evidence. Upper Palaeolithic peoples elsewhere in Europe possessed sophisticated stone technologies, fire, tailored clothing and extensive social connections, but those comparisons describe possibilities, not demonstrated Irish facts.

No Politics, No Diplomacy

Political affairs, warfare, diplomacy, religion and formal learning lie beyond the evidence. There were no known Irish kingdoms, tribes, named leaders, shrines, monuments or institutions. Nor does a reindeer bone provide a religion, an ethnic label or a language. The appropriate history of this date is environmental and archaeological: ice, water, plants, animals and the faint possibility of a human action.

Sea levels were lower than today, and the surrounding shelves and routes between Ireland, Britain and continental Europe differed greatly from the modern map. Yet neither Derryvree nor Castlepook can specify a crossing route, season or mode of travel. The later expansion of the British–Irish Ice Sheet would further transform the terrain and destroy or conceal evidence. What survives is fragmentary precisely because these landscapes were repeatedly reshaped.

For 31,142 BCE, then, Ireland is not a stage for an annual chronicle. It is a cold and changing Late Pleistocene landmass, locally capable of supporting freshwater wetlands and cold-adapted mammals, with a possible but still limited human signal at Castlepook. BIRM-166 offers the clearest nearby evidence: not a calendar entry, but a buried record of living water and tundra vegetation before renewed ice closed over the ground.

Chapter 060 of 100

31141 BCE

The Maguiresbridge Road Section^[60]



31,141 BCE is a modern chronological label, not a date that anyone living in Ireland could have known or recorded. It falls approximately 33,090 years before AD 1950, the conventional starting point for ‘Before Present’ dating, but that arithmetic conversion must not be mistaken for year-level archaeological precision. Around 33,000 calendar years ago, radiocarbon dates have substantial uncertainties, and a single numbered BCE year cannot be tied responsibly to a particular season, event, animal death or human visit.

The appropriate setting is the later part of the Last Glacial period, within Marine Isotope Stage 3 (MIS 3): a long, unstable cold phase before the Last Glacial Maximum. Ireland’s evidence from this remote period is exceptionally fragmentary. Later ice sheets eroded, transported and buried older deposits, while many cave finds were excavated before modern methods of recording sediments, contamination and stratigraphy existed. The history available for this point is therefore environmental and archaeological in the broadest sense. It concerns ice, water, plants, animals and the possibility of fleeting human presence, rather than named peoples or events.

Dating a Calendarless Landscape

Radiocarbon years and calendar years are not interchangeable. The amount of radioactive carbon in the atmosphere has varied over time, so radiocarbon determinations must be calibrated against independently dated records. Even then, a result usually produces a probability range rather than a precise year. This is especially important beyond 30,000 years ago, where calibration is necessarily less exact than for later prehistoric periods.

The nominal date is thus best treated as a waypoint within a broad interval. It lies before the best-reconstructed maximum extent of the last British–Irish Ice Sheet, which was reached around 27,000 years ago in many reconstructions. It also lies within a period when climate altered sharply over centuries and millennia, and when ice margins could expand or contract in response. It would be misleading to describe all Ireland as either ice-covered or ice-free in 31,141 BCE. The survival of different local deposits instead suggests a changing mosaic of glaciers, exposed ground, wetlands and cold open country across different times and regions.

Derryvree Beneath the Drumlin

The most instructive Irish evidence is the freshwater sequence uncovered during road works at Derryvree, near Maguiresbridge in County Fermanagh. In 1969, a cutting through a drumlin revealed organic silts and fine sands between two substantial sheets of glacial till. This was a remarkable discovery: the lower till showed that ice had previously occupied the site; freshwater sediment and organic material then accumulated during a non-glacial interval; and a later ice advance sealed the deposit beneath another till.

The intervening deposit contained remains of freshwater and wet-ground vegetation, including mosses and sedges, together with an insect fauna of cold northern character. These remains support the conclusion that there was standing or slow-moving freshwater, wet margins and sparse vegetation in the locality when the organic beds formed. They do not reveal a picturesque, continuous landscape across the island. Rather, they preserve a local ecological record from a rare window between episodes of glaciation.

Organic material from Derryvree produced a conventional radiocarbon age of about 30,500 radiocarbon years BP, with a large uncertainty. That determination places the deposit in the broad Middle Midlandian, or MIS 3, discussion, but it cannot be converted casually into a single calendar year. Nor can it prove that the wetland existed precisely in 31,141 BCE. Its value is different and greater: it demonstrates that a cold freshwater environment, capable of sustaining plant and insect communities, existed in part of Ireland during this wider late-Pleistocene interval.

Even the deeper history of the Derryvree section remains open to revision. Work at Aghnadarragh in County Antrim has challenged older assumptions about the age of some ‘Fermanagh Stadial’ deposits. This is a salutary warning against turning a useful regional sequence into a rigid timetable. Glacial stratigraphy records an order of events very effectively, but dates and correlations may change as methods improve.

An Island of Cold-Stage Fauna

Southern Irish cave deposits provide a second kind of evidence. Castlepook Cave, near Doneraile in County Cork, is the island’s richest known repository of vertebrate remains from the period leading up to the Last Glacial Maximum. Its assemblage includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena; later cold-stage material includes Arctic fox, wolf and lemmings. These finds show that Ireland was not simply an empty frozen margin throughout MIS 3. At intervals, sufficiently connected and habitable terrain existed for large mammals and their predators.

Yet the cave must not be read as a census taken on one day. More than two thousand bones accumulated there across a long span, through animal deaths, carnivore activity, water movement and disturbance. Spotted hyaenas may themselves have carried some bones into the cave. Re-dating with improved methods has shown that several earlier Irish cave radiocarbon results were too young, in some

cases by thousands of years. The responsible conclusion is that various animals occupied Ireland at different points during the late Ice Age, not that every species listed from Castlepook grazed or hunted together around this particular nominal year.

The animal evidence nevertheless gives the period a tangible character. Reindeer and lemmings indicate severe, open conditions; mammoths and giant deer evoke large-herbivore movement across landscapes that were very unlike later wooded Ireland; hyaenas and wolves indicate predators and scavengers operating within those food webs. Their presence depended on access routes that changed with sea level, ice and climate. Lower seas may have narrowed or altered crossings between Ireland, Britain and the continent, but the exact routes available at any one moment remain uncertain.

The Human Question

There is no securely documented settlement, hearth, tool assemblage or burial in Ireland that can be assigned to 31,141 BCE. Consequently, there is no sound basis for describing a resident population, family group, language, political authority or ritual practice. In particular, nothing in the evidence supports claims about tribes, diplomacy, territorial boundaries, warfare, trade networks, religion, art or formal learning on the island at this date.

A reindeer femur from Castlepook has been reported as bearing a deep linear modification interpreted as a possible stone-tool cut, and has been associated with an age of roughly 33,000 years ago. If that interpretation and chronology are sustained, it would indicate that people processed a reindeer carcass in Ireland during the Upper Palaeolithic, vastly earlier than the formerly accepted evidence for human activity. But it remains an isolated and difficult find from a complex cave history, not proof of a settled community. It should be understood as a significant archaeological question, rather than transformed into a detailed narrative of Ireland's first inhabitants.

Life, Economy and Belief: What Cannot Be Recovered

For people, if any were present, survival would have depended on mobility, knowledge of animal behaviour, shelter, fire, clothing and stone tools. Such statements are reasonable general inferences from Upper Palaeolithic lifeways elsewhere in north-west Europe; they are not direct observations from Ireland. No Irish evidence of this age presently identifies dwellings, campsites, food stores, exchange goods or ceremonial places. Nor can archaeologists determine whether visits were seasonal, repeated, accidental or part of wider movements through the lands now divided by the Irish Sea.

The same restraint applies to society. There were no states, kingdoms, farms, towns or written institutions that can be detected in the Irish record of this period. 'Economy' can only mean the ecological relationships that made life possible: herbivores feeding in cold open habitats, carnivores and scavengers exploiting them, and perhaps occasional humans using animal resources. 'Culture' survives, at most, in the debated mark on a bone and in the possibility of lost or undiscovered stone artefacts. Religious belief and oral knowledge may have existed among any visiting people, but neither can be recovered from the present Irish evidence.

A Record of Change

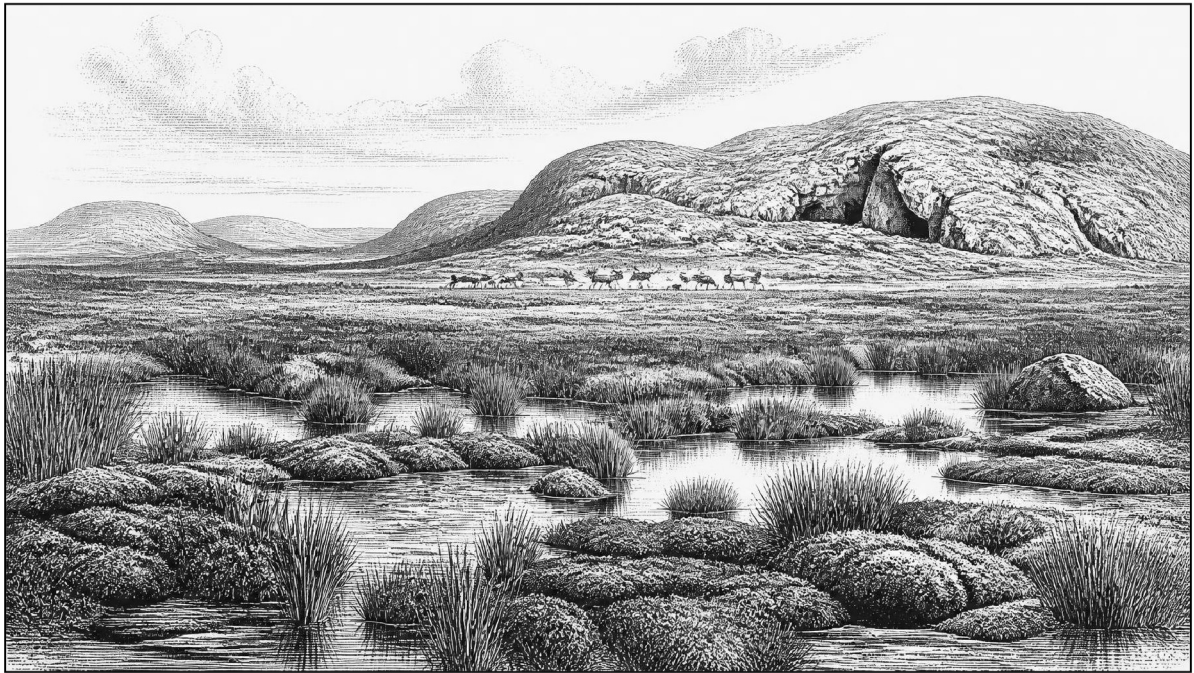
The overriding development around this notional year was environmental instability. Derryvree's buried wetland records a pause between ice advances; Castlepook's animal bones record a faunal world that later glaciation and changing climate largely removed. The ice sheets that subsequently reached their great extent reshaped landforms, stripped deposits and helped create the archaeological silence that confronts historians today.

For Ireland in 31,141 BCE, then, the most defensible history is not a story of rulers or battles. It is the history of a cold, changing island-edge environment: wet hollows beneath Fermanagh's future drumlins, open country capable at times of supporting remarkable Ice Age mammals, and a tentative possibility that humans briefly entered this demanding landscape. The evidence is sparse, but it is enough to show that Ireland's deep past was dynamic long before its later human communities became archaeologically visible.

Chapter 061 of 100

31140 BCE

Mammoths and Muskeg^[61]



The label 31,140 BCE cannot identify an event in Ireland in the ordinary historical sense. It is a modern calendar convention applied to a time approximately 33,089 years before AD 1950, the reference point used in archaeological dating. No Irish written record, named individual, political community or calendar existed. Nor can archaeology isolate one particular year so far back. The responsible view is therefore regional and chronological: this point falls within the later part of Marine Isotope Stage 3, a cold and highly variable phase of the Late Pleistocene, before the fullest expansion of the last British–Irish Ice Sheet.

For Ireland, the evidence is unusually fragmentary but exceptionally evocative. A buried freshwater deposit at Derryvree near Maguiresbridge, County Fermanagh, and animal-bearing limestone caves around Castlepook near Doneraile, County Cork, show that parts of the land now called Ireland could support cold-adapted plants and animals during intervals before later ice advance. They do not amount to a narrative of a single year. They instead reveal a changing Ice-Age country of open ground, pools, caves, grazing animals and predators.

Dating a Calendarless Landscape

The closest securely relevant chronological anchor is the Derryvree deposit. In 1969 a road cutting exposed silts and fine sands trapped between two distinct layers of glacial till within a drumlin. Organic material from that freshwater sequence produced a conventional radiocarbon age of 30,500 years BP, with a substantial stated uncertainty. With modern calibration, scholarship has placed the deposit broadly around 36,900–31,700 calibrated years BP. The nominal date 31,140 BCE sits within that wide span, but it would be misleading to say that the Derryvree wetland formed in that precise year.

This distinction matters. Radiocarbon years are not identical to calendar years because atmospheric carbon-14 has varied through time. Calibration improves the comparison with calendar time, but at around 33,000 calendar years ago the resulting ranges remain broad. A bone date also dates the death of an animal, not necessarily its deposition, collection, scavenging or human handling. Cave deposits can contain remains accumulated across thousands of years and later disturbed by water, animals, frost, excavation or glacial action. The evidence is powerful precisely because it is read with these limits in mind.

Fermanagh's Open Wetland

Derryvree offers the clearest view of environmental conditions relevant to this date. Plant pollen, seeds, moss remains and insect evidence from the organic bed indicate a treeless, periglacial tundra or muskeg landscape. "Muskeg" describes waterlogged ground where mossy vegetation, sedges and shallow pools formed a patchwork rather than a continuous forest or meadow. The surviving flora points to hardy herbaceous and aquatic communities able to withstand short growing seasons, cold winters and frozen ground.

This was not an empty frozen waste. The freshwater sediments show that liquid water persisted locally, supporting wetland plants and insects. Yet the scarcity of tree pollen and the composition of the plant remains show that woodland was absent from the immediate landscape. Isolated pollen grains from trees need not prove local forests: they may have travelled long distances, been reworked from older deposits, or entered the sediment in very small quantities. The sound conclusion is an exposed, largely treeless terrain, with wet hollows and low vegetation rather than a wooded Ireland.

The position of the Derryvree bed between tills is equally important. Before and after its formation, glacier ice or ice-derived sediment affected the locality. During its formation, however, south Fermanagh was not buried beneath an active ice sheet. This does not mean that every region of Ireland was ice-free simultaneously, or that conditions were mild. It demonstrates an interval in which a freshwater ecosystem existed in this part of the island amid a much colder glacial world. Ireland's ice history was not a simple, uninterrupted advance; it involved shifts in ice extent, climate and local habitability.

The Castlepook Faunal Record

More than 300 kilometres to the south-west, Castlepook Cave—also called Mammoth Cave or Doneraile Cave—preserves a different kind of archive. Excavations begun in the late nineteenth and early twentieth centuries recovered a remarkable assemblage of Pleistocene animal bones from its passages and chambers. Subsequent radiocarbon programmes identified remains of reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Taken together, they demonstrate that Ireland supported, at different points in the Late Pleistocene, a fauna familiar from the cold open landscapes of north-western Europe.

Several legacy dates from Castlepook fall in the broad time horizon of this article: a reindeer metacarpal from Elephant Hall was dated to $35,200 \pm 950$ radiocarbon years BP, while a mammoth rib from the same sector produced $34,100 \pm 840$ BP. Other specimens are older or younger. These figures should not be combined into a single imagined animal community living together in 31,140 BCE. The cave was a complex trap, shelter and sedimentary container used over a long period. Water movement and old excavation practices also mixed some material. Recent reassessment has rightly stressed improved bone pretreatment, redating and fresh excavation before firm chronological claims are made.

Even so, the faunal list makes ecological sense beside Derryvree's tundra wetland. Reindeer could exploit sparse vegetation and seasonally varied ground. Arctic foxes and lemmings signal severe cold-country conditions. Mammoths and giant deer indicate wider grazing landscapes, although their precise local habitats and population sizes cannot be reconstructed from a handful of cave finds. Spotted hyaenas, powerful social carnivores and scavengers, show that this was not merely a northern fauna stranded at Europe's edge: there was enough animal biomass and accessible terrain for large predators as well.

The caves themselves should not be mistaken for ordinary settlement sites. Animals may have fallen through openings, been carried in by carnivores, died while sheltering, or had bones washed into chambers. Hyaenas and bears could use caves in different ways. The landscape outside Castlepook would have contained the crucial grazing, hunting and scavenging grounds, but later glaciation, erosion and rising seas have removed or concealed much of that open-air evidence.

The Human Question

Castlepook has become central to a cautious debate about people in Ireland this early. A reindeer femur in the historic collection has been reported as bearing a deep fresh-bone mark interpreted as the result of a sharp stone implement, perhaps during butchery; public reporting associated the specimen with an age of roughly 33,000 years. If future analysis confirms both the mark's human origin and its secure association with the animal's age, it would be major evidence for a fleeting Upper Palaeolithic human presence.

That possibility is not the same as proof of permanent occupation. Ireland has not yielded an unequivocal 33,000-year-old camp, hearth, stone-tool assemblage, dwelling, human burial or human bone. Nor does a modified bone establish the size, identity, language or continuity of any visiting group. A small party might have reached a carcass, butchered it and left little durable trace; alternatively, the mark and its archaeological implications require further testing. The difference between a promising clue and a demonstrated settlement is fundamental.

For this reason, it is not responsible to describe political affairs, warfare, diplomacy, religious institutions or social hierarchy for Ireland in 31,140 BCE. There is no evidence for chiefs, territories, alliances, ritual monuments, formal trade routes, farming or villages. If humans did enter this landscape, their likely economy would have depended on highly mobile hunting, gathering and opportunistic use of animal resources, as elsewhere in Upper Palaeolithic Europe. But that is an inference from wider European comparison, not a directly observed Irish way of life.

Mobility Without Trade

Low global sea levels changed the geography of north-west Europe, but the exact routes by which animals—and potentially people—could have reached Ireland at different moments remain debated. The important point is not to imagine modern coastlines. The Irish Sea basin, glaciers, rivers, exposed shelves and water crossings formed a shifting physical setting. The presence of cold-adapted mammals demonstrates some degree of faunal connectivity with Britain and continental Europe, but fossils alone cannot specify a route, a season or a single migration event.

There is likewise no evidence for trade in the later prehistoric sense: no exchanged ornaments, imported raw materials, pottery, metalwork or stores. Animal movement is not commerce, and possible human travel is not diplomacy. What can be said is that this was a world of movement. Herd animals

would have tracked food and snow conditions; predators followed prey; people, if present, would have faced equally demanding decisions about weather, terrain, shelter and food.

An Archive of Survival

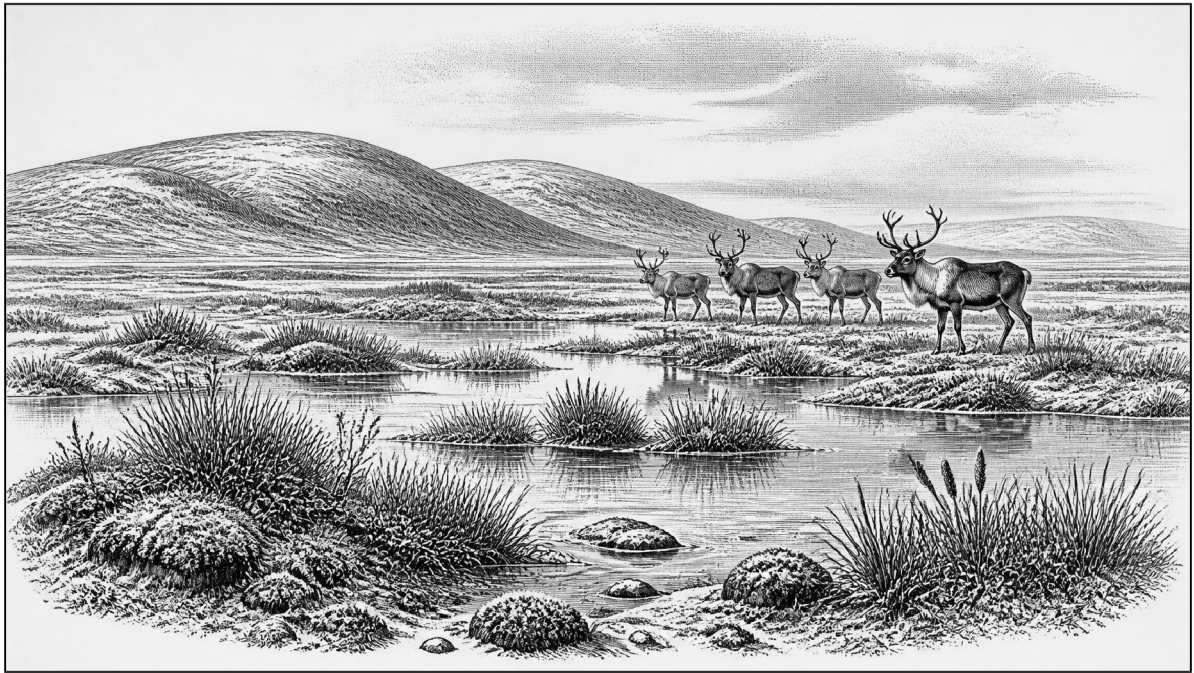
The most important development illuminated around 31,140 BCE is therefore environmental rather than political. Derryvree records an ice-free freshwater tundra interval in Fermanagh; Castlepook records an extraordinary succession of Ice-Age animals in Cork. Together they overturn any simple picture of a uniformly sealed, lifeless Ireland before the last glacial maximum. They show a land repeatedly altered by cold, water and ice, yet capable at times of sustaining wetland ecosystems and substantial mammal communities.

They also show why uncertainty is part of the story rather than a failure of research. A buried silt bed, a moss fragment, a lemming jaw or a reindeer bone is not a chronicle. Each survives by chance and must be tested against geology, dating methods and site formation. Around this nominal year, Ireland is visible only in such fragments: a treeless wetland beneath a later drumlin, a cave assemblage in north Cork, and an unresolved question over whether hunters briefly shared this demanding landscape with mammoths, reindeer and hyaenas.

Chapter 062 of 100

31139 BCE

Derryvree's Cold-Stage Flora^[62]



The label 31,139 BCE is a modern chronological convenience, not a year that anyone in Ireland could have named or recorded. At this depth of time there are no annals, rulers, settlements or events that can be assigned to a particular calendar year. In archaeological terms, the point lies roughly 33,100 years before AD 1950, within the Late Pleistocene and the later part of Marine Isotope Stage 3. The responsible scale is therefore not a single year but a broad, calibrated interval measured in centuries and millennia.

Ireland at this time was in the last Ice Age, but it should not be pictured as a uniformly frozen island. Climate repeatedly shifted between colder and relatively milder phases; ice margins advanced and retreated; and the surviving evidence is uneven. Much of what can be said comes from two very different archives: freshwater deposits sealed beneath later glacial sediment at Derryvree near Maguiresbridge, County Fermanagh, and animal-rich cave deposits at Castlepook, near Doneraile in north County Cork. Neither is a complete portrait of the island in 31,139 BCE. Together, they show that parts of Ireland could support cold-adapted life before the last major expansion of the Irish Ice Sheet.

Time Measured in Sediment

The clearest northern record is Derryvree, where a road cutting through a drumlin exposed organic silts and fine sands trapped between two thick layers of till, the stony debris left by glaciers. The sequence has a simple but important relative order: ice had occupied the area; a freshwater landscape later existed there; then renewed ice buried and preserved the deposit. A conventional radiocarbon determination on the organic layer, Birm-166, was published as about 30,500 radiocarbon years before present. Calibration gives a much wider calendar-age range, approximately 36,900–31,700 calibrated years before present.

That range embraces the broad period represented by 31,139 BCE, but it cannot date a particular season, generation or occurrence at Derryvree. It is evidence for an ice-free interval in north-central Ireland, not proof that every region was ice-free at the same moment. Nor does it establish a stable climate. The freshwater sediments formed in a cold, periglacial setting; ground subject to severe frost, seasonal thaw and sparse vegetation, rather than a modern woodland or pasture landscape.

The plant and animal remains in the Derryvree deposits point to open tundra-like conditions. Their significance lies less in a dramatic single find than in their combination. Organic material could accumulate in shallow freshwater or wet ground; plants and small organisms lived around it; and later glacial advance sealed the deposit below till. This is direct environmental evidence that an exposed, wet landscape existed in Fermanagh during part of MIS 3. It is not evidence for farms, villages or people there.

An Unsettled Ice-Age Island

At the island scale, the chronology of ice growth remains an active field of research. Models and landform studies agree that the great Last Glacial Maximum ice expansion occurred later, broadly from about 26,000 to 20,000 years ago, although individual sectors of the British–Irish Ice Sheet did not behave identically. The Derryvree sequence, alongside other pre-maximum deposits and cave records, matters because it preserves a world before that destructive phase. Subsequent ice cover scoured, reworked or buried much older ground surface across Ireland, helping to explain why evidence for this era is so rare.

South-west Irish caves supply a separate climate indicator. In Crag Cave, County Kerry, uranium-thorium dates show that stalagmites formed episodically during MIS 3. Stalagmite growth requires water to move through the cave and, in this shallow system, is associated with intervals when mean annual conditions were sufficiently mild for liquid water. That does not turn Kerry into a warm refuge, nor can a cave mineral date be translated into a precise weather report for all Ireland. It does, however, reinforce the wider conclusion that the Ice Age was climatically variable and that cold phases included intermittent environmental amelioration.

Sea level was lower than today because great quantities of water were stored in continental ice sheets, so coastlines and shallow seas differed profoundly from modern ones. Yet it would be unwarranted to draw a simple land bridge on a map or to assume that people and animals could always walk to Ireland. Glacial ice, rivers, marshes, exposed shelves and changing sea channels created shifting barriers and routes. The Irish evidence does not identify a route of arrival for any animal, still less for people.

The Castlepook Faunal Record

Castlepook Cave, also known as Mammoth Cave, is the most important Irish locality for the animal world of this broad period. Excavations begun by Richard J. Ussher in the early twentieth century recovered an extraordinary mixture of remains. The Pleistocene fauna includes woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Taken together, these finds demonstrate that, during favourable phases before the Last Glacial Maximum, Ireland supported a much richer assemblage of large mammals and cold-adapted smaller animals than the island did in later history.

The list should not be mistaken for a census of creatures standing together in one Cork valley in one year. Cave deposits accumulate over long periods and can mix bones brought in by carnivores, animals that died after falling into openings, water movement and excavation disturbance. Re-dating with

improved techniques has also shown that some earlier radiocarbon results for southern Irish cave bones were too young. The current evidence places important elements of the Castlepook fauna in MIS 3, while stressing that different specimens need not be contemporary.

Nevertheless, the ecology is telling. Reindeer and lemmings fit open, cold-country environments; Arctic foxes and mountain hares likewise indicate climates unlike present-day Ireland. Mammoth and giant deer required extensive feeding grounds, while wolves and spotted hyaenas show that predators and scavengers exploited the wider herbivore population. A hyaena den or carnivore activity may explain some bone accumulations. The cave therefore records animal movement, death and scavenging as much as it records the surrounding landscape.

The Reindeer Femur Question

One Castlepook bone has given this period exceptional historical interest: a reindeer femur reported as approximately 33,000 years old and bearing a deep linear mark interpreted by zooarchaeologist Ruth Carden as consistent with cutting or chopping by a sharp stone implement. If that interpretation is confirmed, it would be evidence that people handled a reindeer in Ireland during the Upper Palaeolithic, vastly earlier than the formerly accepted evidence for human activity on the island.

The conditional wording is essential. The specimen comes from an old collection, not from a modern, securely excavated occupation floor. No associated hearth, stone-tool assemblage, dwelling, burial, repeated butchery area or stratified campsite of this age has been published from Castlepook. A radiocarbon date measures the age of the bone's surviving organic material; it does not separately date the incision, identify who made it, reveal where the animal died or show how long any people remained in Ireland. Taphonomic study must distinguish potential stone-tool marks from carnivore damage, breakage, trampling, weathering and old recovery damage.

The most that can responsibly be proposed is a possible, brief human episode during the broader period: perhaps a small mobile party encountered and processed a reindeer carcass. Even that is interpretation rather than a demonstrated settlement. It cannot establish a resident population, a migration route, a named group or direct ancestry for later inhabitants. The marked femur is important precisely because it is so rare, but rarity also limits what it can bear.

Society Beyond the Evidence

There is no basis for describing political affairs, diplomacy, warfare, leadership, law, religion, language, art or formal learning in Ireland at this point. There are no known Irish monuments, ritual deposits, graves, houses, tools in secure settlement context or artworks from which such institutions could be reconstructed. It would be misleading to project later Celtic, medieval or even Mesolithic ideas backwards into this far earlier landscape.

Nor can an Irish economy or trade network be documented. If people did briefly reach the island, comparison with Upper Palaeolithic communities elsewhere in north-west Europe suggests that mobility, hunting knowledge and flexible use of animal resources would have been vital. Reindeer elsewhere could provide meat, fat, hide, sinew, antler and bone. But Castlepook's single disputed modification does not prove that these practices occurred in Ireland, and it certainly cannot establish exchange, seasonal scheduling or social organisation.

The defining historical development around 31,139 BCE was environmental rather than political: Ireland was a changing cold-stage landscape in which exposed freshwater basins, open vegetation and a diverse mammal fauna were possible before renewed glaciation transformed the island. Derrynree preserves the wetland evidence; Castlepook preserves an unusually rich faunal archive and a provocative but still limited human question. Both remind us that the earliest history of Ireland is not a sequence of dated deeds, but a painstaking reconstruction from sediments, bones, caves and ice.

Chapter 063 of 100

31138 BCE

Castlepook's Single Cutmark ^[63]



“31,138 BCE” is a useful modern label, but it cannot denote an Irish event recorded in a particular year. No calendar, written testimony, named community or securely dated settlement survives from this depth of time. In archaeological terms it corresponds roughly to 33,100 calibrated years before present (cal BP, where “present” is AD 1950), during the later part of the Pleistocene and within Marine Isotope Stage 3. At such antiquity, even well-dated deposits normally provide ranges of centuries or millennia. The responsible history of Ireland at this point is therefore not an annual chronicle, but an account of changing ice, water, plants, animals and the exceptionally thin possibility of human activity.

A Date Beyond Calendar History

Radiocarbon results are not calendar dates read directly from a specimen. They measure remaining carbon-14 and must be calibrated against independently dated records of past atmospheric change. Calibration at thirty thousand years and more is necessarily less precise than in later prehistory. A numbered BCE year can locate Ireland approximately within a global chronology, but cannot identify a season, a generation, a migration or an encounter. Nor can it justify attaching a cave bone or a layer of sediment to that single year.

The most informative Irish evidence comes from deposits that accumulated across long intervals. At Derryvree, near Maguiresbridge in County Fermanagh, roadworks exposed organic-rich freshwater silts and fine sands trapped between two tills: dense sediments laid down by glacier ice. The sequence is valuable because its order is clear. Ice deposited the lower till; afterwards, a local basin supported freshwater and wet ground in which mineral sediment, plants and insects accumulated; then a later ice advance laid down the upper till and sealed the older landscape. The organic layer produced a

conventional radiocarbon age of 30,500 with a large uncertainty of $\pm 1,170$ – $1,030$ years. Published calibration places it broadly around 36,900–31,700 cal BP. Thus the requested date lies within the wide chronological horizon illuminated by Derryvree, but not at a demonstrable point within its life.

Wet Ground Beneath a Cold Sky

Derryvree indicates a cold, largely treeless and periglacial landscape in this part of Fermanagh. Its pollen, plant remains, mosses and insect fossils point to open vegetation rather than the familiar wooded Ireland of later millennia. Sedges and freshwater plants grew around shallow water; bogbean, water-milfoil, dwarf willow, mountain-avens and other cold-tolerant plants are among the indicators reported from the deposit. Such evidence supports an image of wet tundra or muskeg: waterlogged ground with pools, mossy margins and low vegetation, set within a severe climate. It does not mean that every corner of Ireland looked alike. It records one protected basin, and its contents were later buried beneath moving ice.

Other northern records reinforce the lesson that the island's conditions were regionally varied and repeatedly altered. At Greenagho near Belcoo and at Hollymount near Maguiresbridge, organic deposits between glacial sediments also indicate intervals when ice was absent locally. Aghnadarragh, County Antrim, preserves an older and more complex succession: organic beds there show that woodland, swamps and open ground had existed during an earlier, milder interstadial, whereas subsequent deposits testify to colder, treeless conditions. These are not snapshots of a stable "Ice Age Ireland". They show a landscape repeatedly reorganised by climatic shifts, with advancing ice, runoff, frost action and sediment movement continually destroying or concealing older surfaces.

In south-west Ireland, the stalagmites of Crag Cave, County Kerry, provide a different kind of environmental archive. Uranium-thorium dates show that calcite formed episodically during the last glacial period. In a shallow cave system, such growth requires liquid water to percolate through rock and ground that is not permanently frozen. This is strong evidence for intervals of relative amelioration, not proof of mild weather everywhere or of a human presence. Together, the cave calcite and Fermanagh wetland sediments demonstrate that Ireland's climate changed on timescales far broader than a named BCE year can capture.

An Island Entering Greater Glaciation

By about 31,000 years ago, the British–Irish Ice Sheet was beginning a major expansion. The latest ice-sheet reconstruction, based on landforms, marine sediments, radiocarbon measurements, luminescence dating and cosmogenic exposure ages, depicts substantial ice in the north-west of Ireland around 31 ka, with a large accumulation centre extending from the Derryveagh Mountains towards the Sperrins. It also models smaller ice fields and glaciers in upland districts including the Wicklows, Mourne, Dartry Mountains, MacGillycuddy's Reeks and Knockmealdown. This reconstruction is a carefully constrained scientific interpretation, rather than a map drawn from direct observations of every Irish valley.

The important development was momentum. Ireland had not yet reached the fullest extent of the last glaciation; the maximum spread came later, broadly between 27,000 and 23,000 cal BP in different sectors. But ice was growing, and the following millennia would transform the island's surface. Glaciers and ice streams eroded bedrock, shifted boulders and sediment, altered drainage and eventually covered or

disturbed vast areas. That destructive work helps explain why the archaeological record for this era is so slight. Even if people had left camps, hearths or tool scatters on exposed ground, later ice and meltwater were capable of removing, transporting or burying them.

Sea level was lower than today because water was held in continental ice sheets. Coastlines lay farther out across parts of the continental shelf, though Ireland was not thereby simply joined to Britain by a reliable, walkable land bridge. The North Channel and Irish Sea formed difficult, changing maritime and glacial environments. Any movement between Ireland and neighbouring lands must remain an archaeological question, not an assumed route. The evidence does not permit a map of crossings, trading paths or seasonal circuits.

The Cave Bone from Doneraile

Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork, gives this remote period unusual importance. Its historic collections include remains of reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. These animals did not necessarily share the cave at once; cave assemblages can gather material over very long periods through carnivore activity, natural deaths, water movement and earlier excavation practices. Yet their presence establishes that southern Ireland supported, or lay within the range of, a striking cold-stage fauna during parts of Marine Isotope Stage 3.

Improved radiocarbon pretreatment has been especially consequential at Castlepook. A reassessment led by palaeozoologist Ruth Carden showed that some earlier determinations from Irish cave bones required revision. One Castlepook reindeer femur has been publicised as bearing a deep mark consistent with cutting fresh bone using a sharp stone tool. The specimen has therefore been proposed as evidence for the butchery of reindeer by people roughly thirty-three thousand radiocarbon years ago. It is a serious and exciting claim, but its limits are as important as its promise.

The bone was recovered from an old cave collection, not from an intact excavated camp containing stone tools, hearths, repeated occupation floors and a securely associated animal-processing area. A radiocarbon determination dates the animal's death, not automatically the instant at which a mark was made. Nor can one marked bone establish whether people lived on the island, arrived briefly to hunt, scavenged a carcass, or visited repeatedly. The cutmark is best treated as proposed evidence of human activity, not proof of a settled population or a fully documented Palaeolithic culture in Ireland.

What Cannot Be Written

Accordingly, there is no responsible political history for Ireland in 31,138 BCE. Archaeology identifies no rulers, territories, assemblies, alliances, warfare or diplomacy. There is likewise no direct evidence for households, kin groups, language, religious observance, art, formal learning, exchange networks or a local economy in that particular interval. The absence of such evidence is not proof that no people ever reached Irish ground during the broader period. It is a limit imposed by the surviving record.

If the Castlepook mark was made by people, it implies only a practical episode of carcass processing: perhaps the removal of meat, hide, sinew or marrow from a reindeer. Those possibilities are reasonable inferences from the anatomy of a hunted animal and from Upper Palaeolithic practices elsewhere in Europe, but they cannot be promoted into facts about Ireland. No Irish tool kit can yet be assigned to this

moment, and no trade in flint, antler or other materials can be demonstrated. The better-attested human presence at Alice and Gwendoline Cave in County Clare belongs much later, around 12,800–12,600 cal BP, and should not be projected backwards.

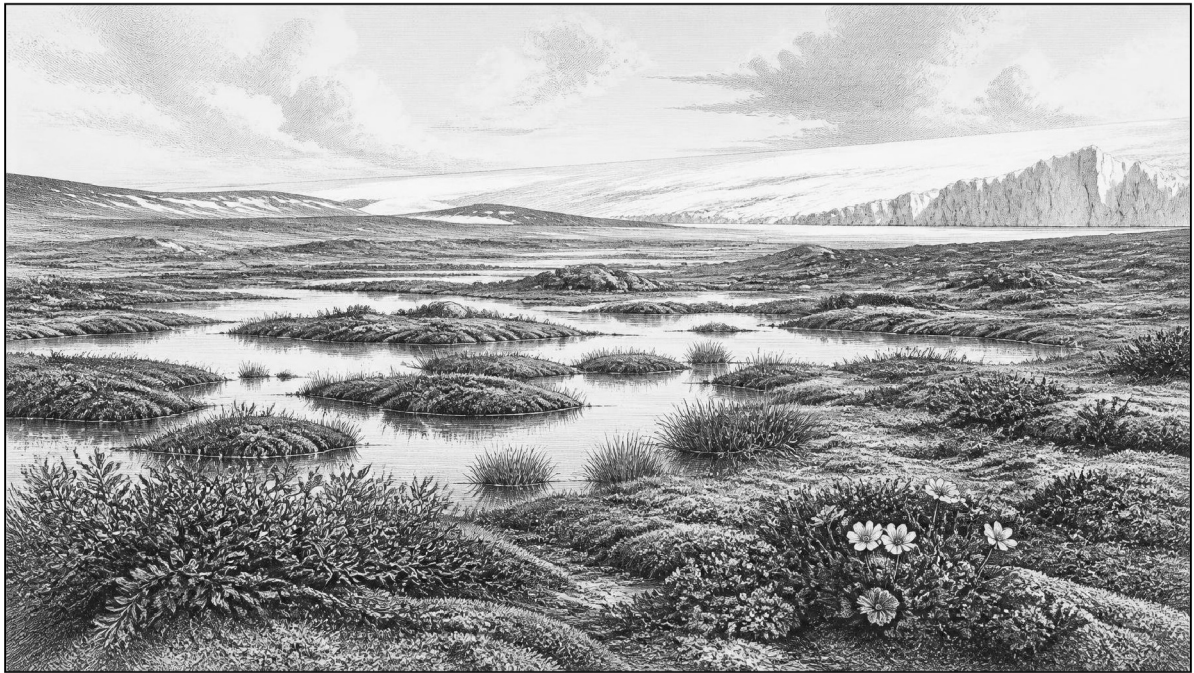
A Landscape of Evidence

The chief historical development around this date was environmental rather than political: Ireland was moving towards fuller glaciation while pockets of freshwater, tundra vegetation and cold-adapted fauna persisted or had recently existed in particular regions. Derryvree's buried wetland, Crag Cave's intermittent calcite and Castlepook's faunal archive are not fragments of the same day, but complementary records of a changing island. Their uncertainty is not a failure of history. It is the history: a reminder that Ireland's earliest recoverable past rests on calibrated ranges, stratified sediments, museum collections and cautiously tested interpretations rather than on a calendar of events.

Chapter 064 of 100

31137 BCE

Derryvree's Mountain-Avens Bed ^[64]



The numbered year 31,137 BCE cannot be treated as a date in the ordinary historical sense. No written record, annual sequence, named community or securely year-specific event exists for Ireland at this depth of time. Archaeologists instead work with long spans, stratigraphic relationships and calibrated ranges. In archaeological convention this point is roughly 33,086 years before AD 1950, or about 33.1 thousand calibrated years before present. It belongs to the Late Pleistocene, within the climatically volatile Marine Isotope Stage 3, before the height of the Last Glacial Maximum.

The most revealing Irish evidence for this broad interval comes not from a settlement but from sediments beneath a drumlin at Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 exposed freshwater silts and fine sands trapped between two substantial sheets of glacial till. The sequence establishes a basic local history: ice had earlier covered the ground; afterwards, a cold freshwater environment developed long enough to accumulate mud, plant remains and insect fossils; then a later advance of glacier ice sealed the deposits below another till. It is one of the rare places where a living Irish landscape can be glimpsed between episodes of glaciation.

A Date Within a Range

Organic material from the Derryvree bed returned a conventional radiocarbon determination of 30,500 years BP, with a large uncertainty of approximately a millennium. Such measurements are not calendar dates. Radiocarbon ages must be calibrated because atmospheric carbon levels have varied over time, and the calibration curve is particularly difficult in this part of the Late Pleistocene. Published assessments

place the deposit broadly within a range extending from about 36,900 to 31,700 calibrated years BP. Thus 31,137 BCE falls within the broad chronological window relevant to the deposit, but it does not identify a particular season, generation or episode at Derryvree.

This distinction matters. The organic bed is evidence for a cold, locally ice-free interval in south Fermanagh, not a weather report for every part of the island. Nor does its radiocarbon result mean that all fossils within it accumulated on the day represented by the modern calendar label. Sediments can form over centuries or longer, while pollen, seeds, mosses and insects each record particular ecological settings. The proper historical picture is therefore regional and probabilistic: around this point in time, at least part of Ireland supported open periglacial wetland rather than being continuously buried beneath moving ice.

Water Between the Tills

Derryvree's plant evidence gives the clearest impression of that environment. The assemblage included mosses, sedges and herbaceous pollen, alongside remains of plants associated with cold, wet ground. Fossil records of mountain avens, dwarf willow, juniper and bogbean are especially significant. They do not reconstruct a dense forest. Instead, they point towards an open, treeless mosaic in which saturated ground, shallow pools, mossy margins and sparse dry patches lay within a generally cold landscape. The term 'muskeg', used by the original investigators, conveys a waterlogged tundra-like terrain rich in mosses and organic matter.

Mountain avens is now familiar from limestone uplands such as the Burren, but in the Derryvree evidence it helps to identify a much colder Pleistocene vegetation community. Bogbean, a plant of freshwater margins, is equally informative: its fossil seed shows that standing or slow-moving water and vegetated wet ground were present. Insect remains reinforce the picture of open pools and decaying plant material. These are modest traces, yet they provide firmer evidence for everyday ecological conditions than any imagined Ice Age panorama. A small wetland could sustain invertebrates, birds and grazing animals even where the wider climate imposed hard winters and a short growing season.

The landscape should not, however, be pictured as a uniform white desert. Periglacial means shaped by severe frost and seasonal thaw, not necessarily permanent ice cover. Local relief, drainage, snow cover and the proximity of ice margins would have created sharply varied habitats. Water could be available in summer; vegetation could take hold in sheltered or saturated places; exposed ridges could remain sparsely colonised. Derryvree's freshwater deposits exist precisely because liquid water, sediment and plant matter were able to accumulate there.

An Island at the Edge of Ice

Across Ireland, the larger glacial setting was changing. The British–Irish Ice Sheet had not yet reached its later maximum configuration everywhere, but ice masses were growing and repeatedly reorganising. Modern reconstructions generally place the local maximum extent of the British–Irish Ice Sheet at about 27,000 years ago in some offshore sectors, while the global Last Glacial Maximum is conventionally dated to about 26,500–19,000 years ago. In 31,137 BCE Ireland was therefore approaching, rather than living at, the maximum cold and ice extent of the last glaciation.

This chronology is not identical in every region. Offshore landforms and marine cores show ice later reaching the Atlantic shelf edge west and north-west of Ireland; work in Donegal, Connemara and south-west Ireland demonstrates that the timing, thickness and flow of ice varied by sector. Some mountain summits may have stood above erosive warm-based ice or lain beneath thin, cold-based ice that did little

to scour the rock. Such debates underline the limits of precision. What is secure is that glaciers repeatedly reshaped Ireland's surface, eroding earlier deposits in some places and preserving exceptional archives, such as Derryvree, where later till covered them.

Sea level was substantially lower than today because so much water was locked in continental ice. Ireland's present shoreline did not exist. Wider coastal plains and exposed shelf areas altered routes for animals and possibly people, although water channels and changing ice barriers still mattered. It is unsafe to speak of a simple, permanent land bridge from Ireland to Britain or continental Europe at this date. Connectivity was episodic and geographically complex, governed by sea level, glacier margins and the suitability of the terrain.

Animals and the Human Question

Caves in southern Ireland supply another, different class of evidence. Castlepook Cave near Doneraile, County Cork, has produced remains of woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Improved radiocarbon methods have shown that parts of the cave fauna belong to Marine Isotope Stage 3, though individual bones and cave deposits need not be contemporary. The assemblage demonstrates that Ireland was intermittently connected to a wider north-west European world of cold-adapted and open-country animals.

These animals should not be transferred uncritically to Derryvree or to this exact year. A mammoth bone in a Cork cave is evidence of the species' Irish presence during a broad period, not proof that mammoths were beside a Fermanagh pool in 31,137 BCE. Likewise, predator bones and hyaena coprolites reveal ecological opportunity and scavenging or denning behaviour at Castlepook, but do not yield a continuous food web for the whole island. Still, the contrast is valuable: Derryvree preserves the small-scale wetland setting, while Castlepook reveals that large mammals and carnivores could enter or inhabit parts of Ireland before the subsequent maximum glaciation.

A reindeer femur from Castlepook has attracted particular attention because a mark on it has been interpreted as damage made by a stone tool during butchery. Public reporting has presented the bone as evidence of human activity in Ireland around 33,000 years ago. It is an important possibility, but it cannot responsibly support a detailed narrative of a resident population in 31,137 BCE. The find is isolated, there is no securely associated tool-kit or habitation floor, and a claimed modification on one bone cannot reveal numbers, language, kinship, ritual or political organisation. It does, however, make it reasonable to keep open the possibility that people entered Ireland intermittently during favourable windows.

No Kingdoms, No Recorded Diplomacy

There is no evidence for political institutions, chiefs, diplomacy, warfare or territorial states in Ireland at this date. Nor can religion be recovered directly from the Derryvree wetland or the scattered cave fauna. It would be misleading to supply invented hunter groups with rituals, leaders or conflicts simply because Upper Palaeolithic communities elsewhere in Europe made art, ornaments and sophisticated stone tools. Similar age does not establish similar activity in Ireland.

If people did visit, their economy would have depended on immediate landscapes: movement through open ground, knowledge of weather and animal behaviour, and access to stone, fuel, water and shelter. That is an inference from hunter-gatherer lifeways and from the resource patterns of the wider European Palaeolithic, not direct Irish evidence. No demonstrable trade network, craft tradition, school of learning

or settlement system can be assigned to Ireland around 31,137 BCE. The most defensible ‘society’ visible here is ecological: plants, insects, herbivores and predators occupying a precarious terrain near advancing ice.

A Fragile Archive

Derryvree’s importance lies partly in what later glaciation did not destroy. The two tills bracket an organic interval and turn a roadside exposure into an archive of environmental change. Its evidence tells of freshwater, tundra plants and insects in a landscape without woodland; it also proves that Ireland’s Pleistocene history was not a single uninterrupted blanket of ice. Castlepook’s bones add a broader faunal dimension, but their cave context and varying ages demand caution.

For 31,137 BCE, then, Ireland is best understood through this combination of evidence and restraint. There is no annual chronicle, no named individual and no event to commemorate. There is, instead, a mountain-avens and bogbean wetland in Fermanagh, preserved beneath later glacial deposits; an island whose shores and ice margins were changing; and rare cave fossils that show connections with the cold-steppe world beyond it. These fragments are limited, but they are enough to recover a real, dynamic Irish landscape from deep time.

Chapter 065 of 100

31136 BCE

Cork's Lost Hyena Range^[65]



The label 31,136 BCE is a modern way of locating an exceptionally remote point in Ireland's past, not a year that anyone then living could have named, recorded or remembered. It falls at roughly 33,100 years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3. That apparent precision is misleading. Neither archaeology nor palaeoenvironmental science can identify an event, season, community or political occurrence in Ireland in this particular calendar year. The evidence consists instead of deposits and fossils dated across broad ranges, some of them with substantial uncertainty and some recovered by antiquarian excavations whose original contexts were imperfectly recorded.

Accordingly, Ireland around this point is best understood as part of a changing Ice-Age interval rather than as the setting for an annual historical narrative. The most responsible account is local and conditional: parts of the landmass were, at different times, capable of supporting cold-adapted plants and animals; other parts were affected by advancing or retreating ice; and the evidence for people is intriguing but not yet sufficient to demonstrate a settled population.

A Date Without a Chronicle

Modern prehistory uses several clocks. "Before Present" conventionally counts backwards from AD 1950; radiocarbon years are measurements derived from the remaining radioactive carbon in once-living material; and calibrated calendar ages convert those measurements through curves based on independently dated records. A conventional radiocarbon age is therefore not automatically a calendar age. At more than 30,000 years ago, even a good measurement commonly corresponds to a wide calibrated range, while old samples and old excavations add further complications.

The date in question lies close to the beginning of the better-resolved growth phase of the last British–Irish Ice Sheet, but it should not be imagined that Ireland was uniformly ice-covered, uniformly ice-free, or climatically stable. Recent syntheses stress that evidence for ice margins before about 31,000 years ago is patchy and uncertain. The great maximum of the last ice sheet came later: offshore work places extensive ice on the Atlantic shelf west of Ireland by about 26,800 calibrated years BP, with retreat beginning by about 25,900 cal BP. The landscape around 31,136 BCE was therefore part of a longer transition towards a far more extensive glaciation, not simply an early version of the fully glaciated Ireland of the Last Glacial Maximum.

Derryvree’s Buried Wetland

The clearest Irish environmental evidence relevant to this broad period comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 exposed an unusual sequence within a drumlin: freshwater silts and fine sands lay between two thick tills, the unsorted sediments deposited by glacier ice. The organic, water-laid layer is important precisely because glaciers later buried and protected it. It preserves a short archive of an environment that existed between episodes of glaciation rather than a continuous record of all Ireland.

Colhoun, Dickson, McCabe and Shotton reported a radiocarbon determination of $30,500 \pm 1,100$ radiocarbon years BP for the Derryvree organic deposits, known as BIRM-166. This is a conventional radiocarbon result, not a precise calibrated calendar date, and its error range alone spans more than two millennia. It should therefore not be assigned to 31,136 BCE as though it described that exact year. Its value is broader: it demonstrates that, during the Middle Midlandian or MIS 3 cold stage, ground in south Fermanagh was at least temporarily free of glacier ice and held freshwater pools, saturated mossy ground and sediment-choked channels.

Plant macrofossils, pollen and insects from the deposit point to an open, treeless tundra or muskeg-like wetland. The vegetation was not a forested Irish countryside: it was a low-growing mosaic of wetland plants, mosses and herbs, with open water in places and exposed mineral ground nearby. Such an environment could be severe without being lifeless. It also shows why a single description of “Ice-Age Ireland” is inadequate. Conditions in one Fermanagh basin cannot be projected without qualification to the south-west coast, the mountains, the Irish Sea basin or every other part of the modern island.

Animals at the Western Edge

County Cork offers a different kind of archive. Castlepook Cave, near Doneraile and sometimes called Mammoth Cave, yielded one of Ireland’s most significant collections of Late Pleistocene mammals during excavations undertaken principally between 1904 and 1908. The National Museum of Ireland holds much of this material. The assemblage includes reindeer, woolly mammoth, giant deer, brown bear, wolf, foxes, mountain hare, lemmings and spotted hyaena. Castlepook is the only presently known Irish locality for spotted-hyaena remains.

These animals do not establish that every species shared the cave, or the Cork landscape, at the same moment. Cave deposits can mix remains accumulated over long periods; carnivores can carry bones into dens; water, sediment movement and early collecting can rearrange them; and later radiocarbon reassessment has shown that some legacy dates need caution. The strongest conclusion is that Ireland lay

within the wider range of continental cold-stage faunas during parts of MIS 3. Reindeer and mammoth imply open grazing landscapes; lemmings and Arctic fox fit cold conditions; hyaenas, wolves and bears indicate a functioning predator and scavenger community. They do not supply a census for 31,136 BCE.

Spotted hyaena is nevertheless a useful emblem of the lost ecosystem. Its presence in Cork is hard to reconcile with an image of Ireland as an isolated, empty refuge. It suggests intermittent connections, whether across changing coasts, through Britain or by other routes available when sea levels and ice margins differed greatly from those of today. The exact route and timing of animal movements remain unresolved. Lower sea levels changed the shape of the Irish Sea region, but the evidence does not licence a simple claim of a permanent dry-land bridge from continental Europe to Ireland.

The Human Question

The most consequential possible evidence for people in Ireland at this depth of time is a reindeer femur from Castlepook reported to carry a deep mark consistent with use of a sharp stone tool. Public accounts have associated the bone with an age of roughly 33,000 years. If microscopic study, dating and context ultimately confirm that the mark was made during fresh-bone butchery, it would indicate a human encounter with a reindeer in Ireland during the Upper Palaeolithic—perhaps involving meat, marrow, hide or sinew.

That proposition must remain carefully limited. A date on an animal bone dates the animal's death within a probability range; it does not, by itself, date a cut, establish who made it, or demonstrate an occupation. Castlepook has not produced a securely associated hearth, stone-tool assemblage, dwelling floor, burial, human bone or repeated settlement sequence of comparable age. The material derives from early excavations rather than a modern stratigraphic investigation. Natural surface damage, carnivore activity, excavation marks and subsequent handling must all be excluded before a single modification is treated as proof of butchery.

Nor can the possible visitors be assigned responsibly to the Aurignacian, Gravettian or another named continental archaeological tradition. Those labels depend on diagnostic artefact assemblages, which Ireland has not yielded for this period. The reindeer femur, if anthropogenic, would support a brief act of human activity, not a claim that a resident people, language, ancestry or continuous Irish population had begun. Later advances of ice would have eroded, buried or displaced many surfaces where camps might once have stood, helping to explain why the record is so sparse without turning absence of evidence into proof of either presence or absence.

No Kingdoms, No Trade Network

There were no political affairs in the historical sense that can be recovered for Ireland at this date: no named leaders, territories, diplomacy, battles, law or institutions. Equally, there is no evidence for religious monuments, formal burial grounds, art, writing, learning traditions or exchange networks. It would be misleading to populate the landscape with tribes, chiefs or rituals merely because human groups elsewhere in Europe possessed rich social worlds. Ireland's evidence does not identify such communities here.

If people did visit, their economy was almost certainly not an economy of farms, fields or markets. At most, the Castlepook evidence could suggest opportunistic hunting or carcass processing within a mobile subsistence regime. The more securely documented economy was ecological: herbivores moved through

open habitats; carnivores exploited prey and carrion; wetland plants occupied shallow pools; and glaciers periodically altered the terrain on a scale no human group could control. “Settlement” in the strict archaeological sense cannot presently be demonstrated.

An Ireland Recast by Ice

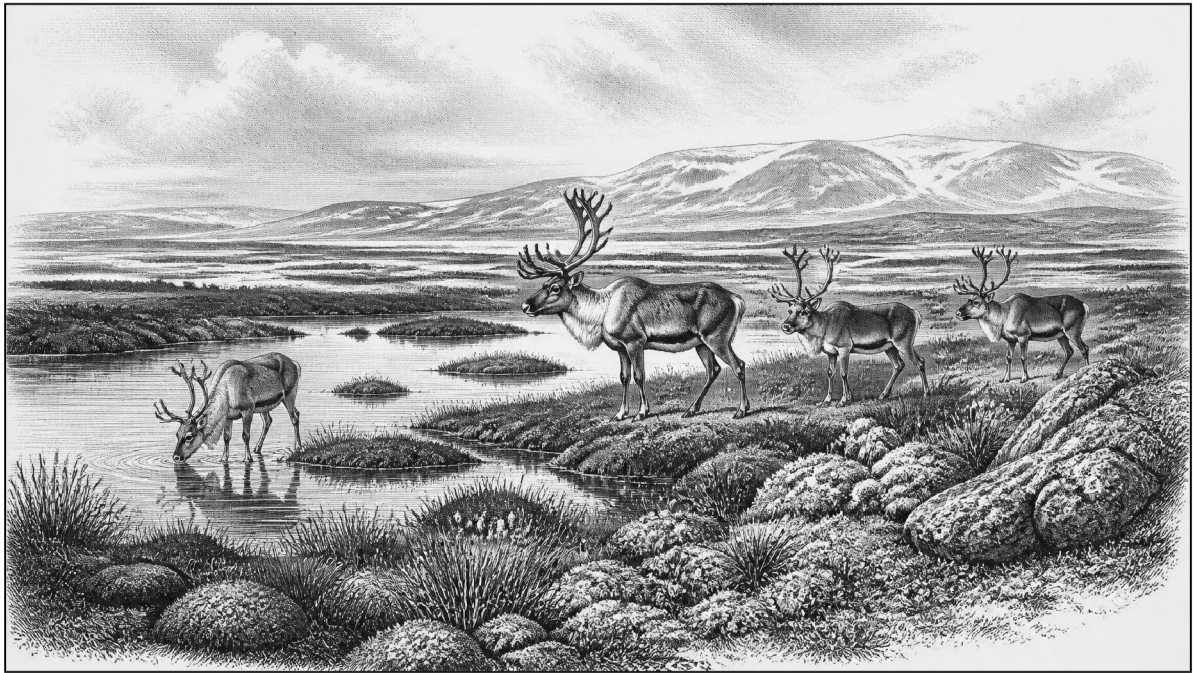
The chief development around 31,136 BCE was environmental instability. The buried Fermanagh wetland records a rare ice-free interval in one locality; the Cork caves record an animal world whose composition has no modern Irish equivalent; and the expanding ice-sheet system foreshadowed the destruction or concealment of much older ground surface. Regional change, rather than politics, is the story: water collecting between tills, tundra vegetation taking hold, animals reaching the western edge of Europe, and renewed ice ultimately remaking the land.

For that reason, this date should be treated as a point within a wide archaeological horizon. The evidence can responsibly illuminate a cold, largely treeless and variably accessible Ireland, rich in environmental change and occasionally visited by large mammals. It cannot yield an event of the year, a named person or a calendar-day beginning for Irish history. Its importance lies in showing how much of Ireland’s deepest past survives not in chronicles, but in a freshwater silt bed beneath a Fermanagh drumlin and fossil bones from a Cork cave.

Chapter 066 of 100

31135 BCE

Bogbean and Bone^[66]



The label 31,135 BCE is a modern chronological convenience, not a year recorded by anybody in Ireland. It lies roughly 33,000 years before the conventional archaeological present of AD 1950, within the Late Pleistocene and Marine Isotope Stage 3, a long, climatically unstable phase of the last Ice Age. No Irish calendar, written source, named community, political unit or datable event can be attached to this point. Archaeology can instead offer overlapping ranges: radiocarbon determinations, cave-fauna sequences, glacial sediments and fossil plant remains that illuminate conditions across centuries or millennia. They must not be treated as a diary for a single year.

For Ireland, this is a history principally of environment and possibility. The island's surviving evidence suggests a cold, mostly open landscape whose habitats, animal populations and accessibility changed repeatedly as ice accumulated. It does not demonstrate a settled human population. The most striking object relevant to this broad era is a reindeer femur from Castlepook Cave near Doneraile, County Cork, carrying a mark interpreted as possibly made by a sharp stone tool. That interpretation is important, but the evidence remains too limited to turn it into a story of a village, a hunt on a known day, or continuous occupation.

A Date Beyond Calendar Precision

Scientific dates at this depth require special care. A radiocarbon age is not the same thing as a calendar age, and calibration turns one laboratory result into a probability range rather than an exact historical date. At Derryvree, near Maguiresbridge in County Fermanagh, organic-rich freshwater deposits produced a radiocarbon determination of 30,500 +1,170/-1,030 radiocarbon years BP. The uncertainty is

already more than a millennium before calibration is considered. The deposit also accumulated over time. It is therefore responsible to say that it provides an unusually valuable environmental window on the Middle Midlandian cold phase, not that it describes Ireland precisely in 31,135 BCE.

The same restraint is needed at Castlepook Cave, also called Mammoth Cave. The cave contains bones deposited over a long interval, with individual dates extending across much of the period before and around the Last Glacial Maximum. A bone dates the life and death of an animal, not automatically the arrival of every other bone nearby, the making of a surface mark, or the presence of people. Earlier excavators recovered rich material, but their methods did not meet modern standards of contextual recording. Water movement, carnivore activity and old disturbance further complicate the archive.

Derryvree's Cold Wetland

Derryvree is the clearest Irish environmental archive relevant to the wider period. Road cutting in 1969 exposed organic silts and fine sands between two thick tills beneath a drumlin. The lower till records an earlier episode of glaciation; the upper till shows that ice later returned and sealed the freshwater sediments. Between them lies evidence for a non-glacial, but still severe, landscape.

Fossil pollen, plant macrofossils, mosses, sedges and insects point to largely treeless, cold-open ground. The assemblage has been described as tundra or muskeg-like: wet, mossy and sedgy areas around shallow fresh water, with frost-affected terrain beyond. Finds of bogbean (*Menyanthes trifoliata*) and mountain-avens (*Dryas octopetala*) are especially evocative. Neither proves a uniform blanket of vegetation across all Ireland, but together with the wider plant and insect evidence they indicate conditions very different from the wooded, oceanic island of later millennia.

This was not necessarily an empty white wilderness. Freshwater pools, margins of sedge and moss, patches of herbs, exposed mineral ground and low shrubs could create a varied local mosaic. Yet it was a difficult setting, shaped by long winters, seasonal freezing and short productive summers. The Derryvree deposits document living communities of plants and invertebrates close to water. They do not disclose fields, houses, farms or human food stores. Agriculture, permanent villages and managed landscapes belong to far later Irish prehistory.

Ice Building Across the Island

At this broad point in time, the British–Irish Ice Sheet was developing unevenly rather than sitting at its final maximum. Modern reconstructions begin their detailed sequence around 31,000 years before present because evidence earlier than that is sparse. They indicate ice accumulation in northern and upland Ireland, including a substantial northern ice cap and smaller ice fields or glaciers in several mountain regions. By about 28,000 years before present, reconstruction models show Ireland becoming almost wholly ice-covered; the maximum extent of the wider ice sheet followed later, broadly around 26,000 years before present.

That sequence matters because it rules out easy generalisations. Ireland was neither simply ice-free nor uniformly buried beneath an unchanging sheet at every moment in this era. Conditions varied by region, altitude and climatic pulse. In south-west Ireland, Crag Cave in County Kerry preserves speleothems—cave calcite deposits—whose episodic growth during Marine Isotope Stage 3 indicates intervals when liquid water circulated and mean annual temperatures were sufficiently mild for calcite

formation. Such deposits are evidence for climatic fluctuation, not for comfortable conditions or human habitation. Their significance lies in showing that Irish climate responded sharply to wider North Atlantic changes.

Sea level was lower than today, and the configuration of coasts and shallow seas differed greatly. Ireland's ecological connections to Britain and continental north-west Europe could consequently have changed with climate and sea level. But the available Irish evidence cannot establish a particular land bridge, crossing route or journey in 31,135 BCE. It is safest to speak of changing regional connectivity rather than to imagine a known migration corridor.

Castlepook's Animal World

Castlepook Cave provides the richest known Irish vertebrate record for the time leading towards the Last Glacial Maximum. Its fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena; later deposits have also yielded Arctic fox, wolf and lemmings. This collection demonstrates that, during favourable phases of the Late Pleistocene, Ireland supported or received a far more varied large-mammal fauna than the modern island does.

It would nevertheless be misleading to place all these animals in one simultaneous scene. Cave assemblages can combine remains of different ages, and carnivores can carry bones from elsewhere into a den. Spotted hyaenas are particularly important to interpretation. Their presence means that at least some bones may record scavenging, prey transport and denning rather than human disposal. The cave is an archive of repeated animal and geological processes, not a neatly preserved camp floor.

Reindeer are especially relevant to the cold, open environments indicated at Derryvree. Their presence suggests grazing landscapes capable of supporting mobile herbivores, while mammoth and giant deer point to extensive plant resources in at least some phases. Predators and scavengers reveal an active food web. This was an ecological world in which carcasses were contested resources and caves could become repositories of bone. That conclusion is directly supported by faunal evidence; claims about exact herd routes, seasonal movements or population sizes remain interpretation.

The Marked Reindeer Femur

The Castlepook reindeer femur has given this period unusual archaeological importance. It has been presented by Ruth Carden and County Cork heritage publications as approximately 33,000 years old and as bearing a deep incision consistent with cutting fresh tissue using a sharp stone tool. If the mark is confirmed as anthropogenic, it may indicate that one or more Upper Palaeolithic people processed a reindeer in Ireland during the broader period represented by the bone.

That is a major possibility, but it is not proof of settlement. No securely associated stone-tool assemblage, hearth, built shelter, burial, occupation surface or repeated butchery area of comparable age has been recovered from Castlepook. Nor does the bone prove that people killed the animal, butchered it inside the cave, lived nearby, or remained on the island. County Cork's own heritage interpretation notes a plausible alternative sequence: the animal may have been butchered elsewhere, after which carnivores carried discarded remains into the cave.

The distinction is more than academic. A brief visit by a small hunting party is very different from a resident population. Across north-west Europe, Upper Palaeolithic *Homo sapiens* communities used sophisticated stone technologies, fire, tailored clothing and wide social networks; some also made art and

personal ornaments. Those comparisons make short-lived visits to a cold Irish landscape conceivable. They do not supply direct evidence that these practices occurred in Ireland at this date. Irish archaeology has not yet recovered an in-situ assemblage that can responsibly support such detail.

What Cannot Yet Be Written

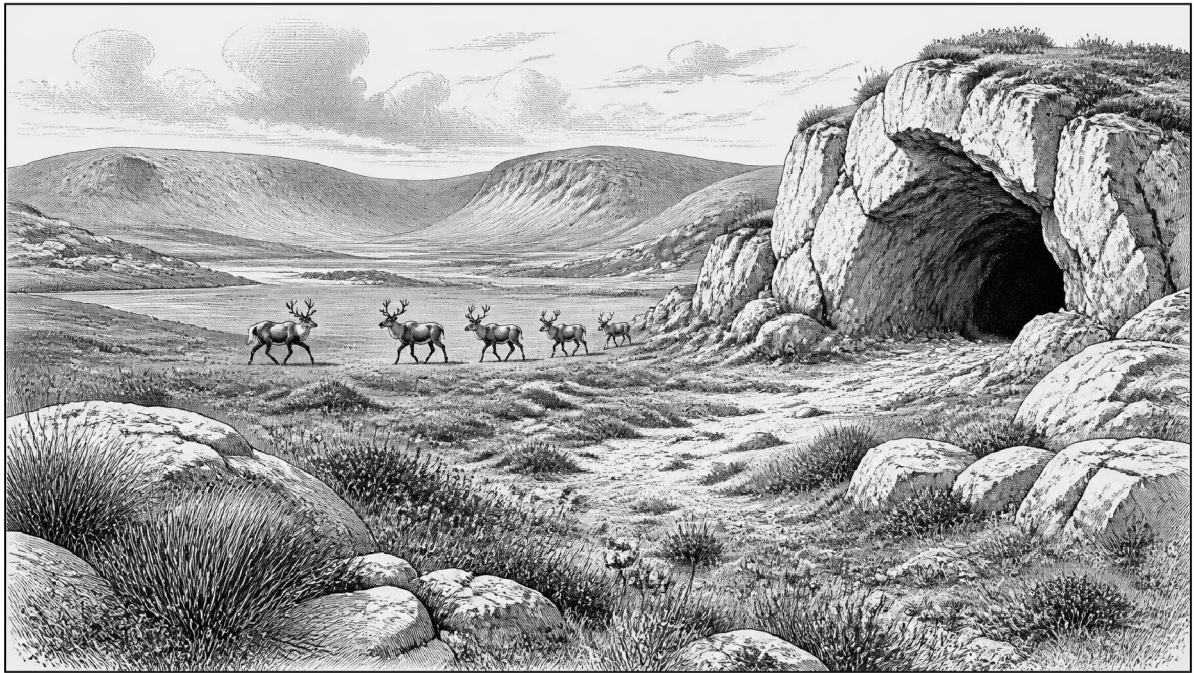
There are no political affairs to report for Ireland in this notional year: no rulers, territories, alliances, diplomacy or warfare can be identified. There is likewise no evidence for religion, ceremonial monuments, formal learning, exchange networks or trade. A reindeer bone bearing a possible cut mark may speak to practical knowledge of animal anatomy and sharp tools, but it cannot reveal language, belief or social organisation. The absence of evidence is partly a consequence of later glaciation, erosion and sea-level change, all of which removed or buried potential sites; it is also a reminder not to fill the silence with invention.

What can be said is both narrower and remarkable. Around the broad time represented by 31,135 BCE, Ireland was a changing Ice Age environment rather than a recognisable historical society. Freshwater tundra wetlands survived in Fermanagh between episodes of ice advance. In southern limestone caves, a distinctive cold-stage fauna left a fragmented record. Expanding ice was increasingly transforming the island and limiting habitats. A single reindeer femur from Castlepook may preserve a fleeting human connection to that world. Future controlled excavation, microscopic analysis of bone modifications, improved dating and sediment study may strengthen or weaken that claim. For now, bogbean seeds, moss-rich silts and animal bone remain the responsible witnesses.

Chapter 067 of 100

31134 BCE

The Castlepook Incision^[67]



A Year Without a Calendar

The label 31,134 BCE is a useful modern point on a long chronological scale, but it cannot identify an event that happened in a single Irish year. Nobody in Ireland then used a calendar that can be converted into BCE years, and the surviving evidence is neither precise nor evenly distributed. Treated simply as arithmetic, the label lies about 33,083 years before AD 1950, the conventional reference point for “before present”. Yet radiocarbon ages require calibration and carry ranges of uncertainty; deposits may also have formed over long periods. The responsible history of Ireland at this depth is therefore a history of dated ranges, fossils, sediments and probabilities, not named people or dated episodes.

In broad archaeological terms, this point falls within the Late Pleistocene, during Marine Isotope Stage 3 (MIS 3), an unstable middle phase of the last Ice Age. It preceded the fullest expansion of the last British–Irish Ice Sheet. The Last Glacial Maximum in Ireland came later, broadly between about 28,000 and 20,000 calibrated years before present, although the timing and extent of ice advance differed between regions. Around the notional year represented here, Ireland was not yet simply a featureless ice sheet. Parts of the island supported animals, while the climate, coastlines, vegetation and access routes altered repeatedly over millennia.

Castlepook's Uneasy Evidence

The crucial Irish locality is Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. Set in Carboniferous limestone above the Awbeg valley, it has yielded Ireland's richest known assemblage of vertebrate remains from the period leading towards the Last Glacial Maximum. Early twentieth-century excavators recovered bones and teeth from a complex cave system; the collection is now principally associated with the National Museum of Ireland. Re-examination, improved sample preparation and modern accelerator radiocarbon dating have shown that several old dates from Castlepook had been too young, in some cases by thousands of radiocarbon years. This moved important parts of the assemblage firmly back into MIS 3.

The cave's record supports the presence in Ireland, at different times within that long interval, of woolly mammoth, giant deer, reindeer, brown bear and spotted hyena. Later cold-stage material includes Arctic fox, wolf and lemmings. This is compelling evidence for a varied Ice Age animal world, but it is not a census of one landscape on one day. Cave deposits accumulate through many processes: animals die naturally, carnivores drag in prey or carrion, water shifts bones, people disturb deposits, and early excavations rarely recorded the microscopic layers and positions expected today. A mammoth tooth, a hyena skull and a reindeer limb need not represent a single herd, season or generation.

One specimen makes the modern date especially arresting: a reindeer femur from Castlepook bearing a deep linear mark interpreted as damage from a sharp stone implement during carcass processing. Public discussion has associated the bone with an age of roughly 33,000 years ago and, by extension, with a date around the thirty-first millennium BCE. If the mark is securely identified as a cut or chop made on fresh bone, it may be Ireland's earliest evidence of human handling of an animal carcass. It would be an exceptional discovery. But it remains a narrow and difficult piece of evidence, rather than proof of an established settlement.

The bone does not come with a securely associated hearth, stone-tool assemblage, dwelling floor, human burial, refuse pit or repeated occupation surface of comparable age. Its date concerns the death of the animal, not necessarily the moment when the mark was made, the place where the animal was killed, or the identity of whoever made it. Carnivore damage, sediment movement and the complicated history of old collections demand caution. The mark may record butchery; it cannot demonstrate a camp at Castlepook, still less a continuous Irish population.

An Open, Cold Country

Even with those qualifications, Castlepook changes the scale on which Ireland's past can be imagined. Reindeer and mammoth imply environments very unlike modern wooded and Atlantic Ireland. The most defensible picture is of a generally open, cold landscape with grassland, herb-rich tundra or steppe-tundra elements, broken by wetter hollows, river corridors, exposed rock and patches of low vegetation. Such habitats could sustain grazing and browsing mammals and the predators or scavengers that followed them. They should not be visualised as an unchanging polar desert: MIS 3 climate was marked by abrupt fluctuations, and local conditions would have varied with altitude, shelter, soils and proximity to the sea.

Spotted hyena is particularly important. Castlepook is the only Irish site known to have produced a substantial record of this carnivore. Hyenas are likely to have helped create parts of the cave assemblage, carrying and chewing bones, and their presence signals a food web with sizeable herbivores. Their role also explains why a cave cannot automatically be treated as a human hunting station. The animals and bone deposits reveal ecological opportunity, but also danger and competition for sheltered places.

Sea level was substantially lower than today during the Ice Age, exposing more of the continental shelf. The geography of Ireland, Britain and the western European mainland was consequently different, but changing sea level alone cannot prove a convenient land bridge at this precise moment or a particular route taken by animals or people. Faunal movements may have depended on shifting coastlines, temporary connections, ice-free corridors and short sea crossings. The Irish record shows that mammals reached the island during MIS 3; the exact pathways remain a subject for geological and genetic research.

People, If They Came

If the Castlepook incision does preserve human butchery, the people responsible were mobile hunter-gatherers rather than members of a known Irish “culture” in the later archaeological sense. They would have required expert knowledge of animal movement, weather, stone-working and the value of meat, hide, sinew, bone and fat. Processing a carcass could have followed a hunt, scavenging, or the recovery of an animal found dead. The single marked bone cannot decide among these possibilities. Nor can it establish language, ancestry, social identity or whether the visitors arrived from Britain, continental Europe or elsewhere.

There is no evidence from around 31,134 BCE for political institutions, chiefs, territories, warfare, diplomacy, tribute or formal law in Ireland. Equally, there is no basis for describing trade networks, farms, villages, monuments, graves, shrines or a settled religious system. Absence from the record is not proof that people never spoke, cooperated, exchanged gifts or held beliefs; such practices leave little trace after tens of millennia. But responsible history must distinguish that universal human possibility from evidence specific to Ireland. At present, the evidence does not permit an Irish narrative of rulers or communities for this date.

Culture and learning are best understood here as practical knowledge, if humans were present at all: reading snow, tracks and animal behaviour; selecting suitable stone; keeping warm; and moving through a hazardous terrain. No artwork, ornament, musical instrument or securely dated tool from Ireland demonstrates such activity at this time. The best-established later Palaeolithic evidence for human activity on the island remains the cut-marked brown-bear patella from Alice and Gwendoline Cave, County Clare, dated to roughly 12,810–12,590 calibrated years before present. That much later find is more securely dated, but it cannot be projected backwards to fill the huge gap at Castlepook.

Loss, Survival and Future Work

The apparent thinness of the record has a physical explanation. Subsequent ice advance, erosion, meltwater, changing sea level and soil formation destroyed, buried or rearranged much of the evidence that might once have existed. Caves offer rare protected archives, yet they too are difficult: they mix natural and human histories, and many Irish cave collections were recovered before modern excavation methods. The lack of a visible campsite may reflect brief visitation, poor preservation, later glacial damage or simple failure to search the right places. It cannot be converted automatically into proof that nobody ever came.

Recent work at Castlepook has therefore concentrated on locating undisturbed deposits and applying methods unavailable to the original excavators: renewed excavation, direct radiocarbon dating, sediment study, microscopic assessment of bone surfaces, and potentially ancient DNA and other biomolecular

analyses. These methods may confirm, refine or overturn individual claims. Their greatest value is not the promise of a dramatic “first” but the chance to separate a genuine human trace from the far larger, older story of animals, caves and ice.

For the notional year 31,134 BCE, Ireland emerges not as a nation with a recoverable political history, but as a changing northern landscape within the Ice Age world. Castlepook’s fauna demonstrates that large mammals and predators occupied, or repeatedly reached, part of the island during MIS 3. A marked reindeer bone raises the serious possibility of a brief human encounter with that world. It does not yet give us a settlement, a society or an event. Its importance lies precisely in that disciplined uncertainty: one incision, one cave and a landscape whose deeper human history is still being tested.

Chapter 068 of 100

31133 BCE

Maguirebridge Before the Ice^[68]



Modern calendar-year precision is not available for Ireland in 31,133 BCE. No person living then recorded a date, and no surviving Irish deposit can be assigned securely to that single year. The label is nevertheless useful as a point within the Late Pleistocene, broadly Marine Isotope Stage 3 (MIS 3), during the Midlandian cold stage. In conventional archaeological terms it lies about 33,082 years before AD 1950. That arithmetic must not be mistaken for an event-date. At this depth of time, radiocarbon results require calibration and are expressed as broad probability ranges; environmental layers often represent years, centuries or longer intervals rather than a moment.

A Cold-Stage Window

The closest Irish evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. Road construction in 1969 cut through a drumlin and exposed a striking sequence: a freshwater deposit of fine sands and silts, containing organic remains, lay between two thick tills. Tills are unsorted sediments left by glacier ice. The order of deposition is therefore secure even where exact dating is not: ice formed the lower till; later, at least this locality became ice-free long enough for water, sediment and living organisms to accumulate; a renewed advance of ice eventually covered and sealed the deposit beneath upper till.

Organic material from the freshwater horizon, catalogue number Birm-166, produced a conventional radiocarbon age of 30,500 years BP, with a substantial uncertainty. Published calibrations place it broadly at about 36,900–31,700 calendar years BP, approximately 34,950–29,750 BCE. The notional year 31,133 BCE falls within that wide span. It cannot be attached to a particular season, pond level, plant, animal or human action at Derryvree. Yet the bed is an exceptional witness to conditions in an Irish locality during the later part of MIS 3.

This distinction between evidence and interpretation matters. The sediments directly demonstrate that a freshwater environment and organic material existed at Derryvree during an interval between glacial advances. The plant, insect and sediment evidence supports reconstruction of a cold, open, periglacial wetland. It does not establish that all Ireland had the same vegetation, that the island was entirely ice-free, or that a single climatic phase prevailed without interruption. Ireland was environmentally varied, and the climate system of the North Atlantic was notably unstable.

Wet Ground, Open Country

The Derryvree assemblage indicates a treeless landscape with tundra-like and muskeg characteristics. Mosses, sedges, grasses and herbaceous plants dominated; dwarf shrubs and scattered juniper could occur in suitable places. Fossil remains of aquatic and wet-ground plants, together with insects associated with shallow water, wet organic ground and open vegetation, point to pools, saturated margins and plant-rich mud rather than a dry, featureless plain. The scene was not necessarily snow-covered throughout the year. Periglacial means a severe environment shaped by frost, seasonal thaw and ground freezing near an ice margin, not an unchanging frozen desert.

Winters were evidently harsh, and tree growth was severely constrained. In summer, however, exposed vegetation, shallow fresh water and wetland plants supported an ecological community. The important historical fact is not that modern Fermanagh had somehow appeared in miniature, but that a functioning cold-climate ecosystem existed here between episodes of glaciation. Its survival as a buried bed is partly a matter of chance. Later ice altered or removed vast quantities of older ground surface across Ireland, leaving the country with a fragmentary record of the period.

Greenagho, near Belcoo in the same county, provides related evidence for an interstadial or ice-free interval in northern Ireland, while cave faunas in the south show that parts of the island could support substantial mammals during MIS 3. These records should be placed beside one another, not forced into a single map for one imagined year. Derryvree records a wetland in Fermanagh; southern caves record animals accumulated in particular cave systems; offshore and landform studies trace later ice expansion. Together they show change across regions and through time, rather than a stable national landscape.

Animals and the Cave Record

At Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork, old excavations recovered a mixed collection of Pleistocene animal remains. Modern re-dating has reinforced the importance of southern Irish cave faunas for MIS 3. The evidence supports the presence, at different points within that broad period, of cold-stage large mammals and predators including mammoth, reindeer, giant deer and spotted hyaena. It demonstrates that parts of Ireland were available to an open-country fauna before the later, more extensive growth of the last ice sheet.

It would be wrong, however, to turn this list into a census for 31,133 BCE. Cave assemblages are produced through many processes: carnivores carry in prey; animals die naturally; water and sediment move bones; earlier excavators disturb deposits; and bones of different ages can become associated in museum collections. The revised Castlepook dates also show why older radiocarbon results must be revisited as laboratory techniques improve. They strengthen the case for an ancient faunal horizon, but do not tell us which species stood outside the cave in any particular year.

A reindeer femur from the Castlepook collection has been publicly described as bearing a deep mark consistent with cutting or chopping by a stone tool, and has been assigned broadly to around 31,000 BCE. If that mark is confirmed as human butchery, it would be momentous evidence that people processed a reindeer in Ireland during the Upper Palaeolithic. It would not prove a permanent settlement, a named population, continuous occupation, a hunting territory or descent from those visitors. The fragment derives from an old, disturbed cave collection, not a securely excavated occupation floor with associated hearths, tools and dwellings. For this year, it is responsible to treat the find as a significant but limited and still interpretative indication, not as the beginning of a detailed Irish human history.

People Beyond the Evidence

There is no evidence from Ireland around this date for political communities, rulers, borders, diplomacy or organised warfare. Nor is there evidence for villages, cultivated fields, livestock, pottery, buildings, graves, monuments, exchange networks or a written tradition. Religion, language, kinship rules, music, art and learning are equally beyond recovery from the Irish record. Their absence from the account is not a judgement that such things could not have existed among any people who may have reached the island; it is a recognition that archaeology cannot responsibly supply their contents here.

Contemporary Upper Palaeolithic societies elsewhere in north-west Europe show that mobile hunter-gatherers could possess sophisticated knowledge, social ties and symbolic cultures. That comparison helps explain what a small visiting group might have been capable of, but it is not evidence that those practices occurred in Ireland. If people did reach the island during MIS 3, their economy may have involved short-term hunting and carcass processing, perhaps linked to reindeer or other game. This remains an inference from a single possible butchery trace and from continental analogy, not a demonstrated Irish economy or trade system.

Travel itself cannot be reconstructed with confidence. Sea level was lower during the Ice Age than today, exposing additional continental shelf in places and changing coastlines. But lower sea level did not automatically create a simple land bridge to every part of Ireland, and the relevant shorelines now lie largely offshore. The island's position at the north-western edge of Europe, its variable marine separations and the severe climate made any movement consequential. No Irish evidence identifies a route, boat technology, season of crossing or place of origin for hypothetical visitors.

Ice on the Horizon

The wider importance of this interval lies in what followed. Modern reconstructions of the British-Irish Ice Sheet indicate that major ice-sheet growth was under way across the region after about 34,000 years ago, with its maximum volume achieved much later, around 23,000 years ago. At the date represented here, Ireland was therefore not simply “before the Ice Age”: it was already within the last glacial period, in a landscape where local ice-free wetlands and animal habitats existed amid a changing climate and an expanding ice-sheet system.

Derryvree preserves the contrast with unusual clarity. Beneath its later till is evidence for water, mosses, sedges, insects and open ground; above it is the material signature of renewed glaciation. The deposit gives no episode of kingship, battle or migration to place in 31,133 BCE. Instead, it offers something more fundamental: proof that Ireland's deep past included local ecological opportunity

between glacial advances, and a warning against treating a modern year-number as if it were an ancient diary entry. Around this point in time, the best history is an environmental one—specific in its sediments and organisms, careful in its dates, and candid about its silences.

Chapter 069 of 100

31132 BCE

Derryvree's Fossil Wetland^[69]



The label 31,132 BCE is useful only as a modern point on a very long timescale. It cannot identify a single Irish year, season, person or event. No written record, settlement sequence or archaeological layer permits calendar-year precision this far back. In scientific terms, the date falls about 33,080 calendar years before AD 1950, within the later part of Marine Isotope Stage 3 (MIS 3), a climatically unstable phase of the last Ice Age. The responsible history of Ireland at this point is therefore an account of broad, calibrated ranges and fragmentary evidence, not an annual chronicle.

The closest especially informative Irish deposit is at Derryvree, near Maguiresbridge in County Fermanagh. There, roadworks in 1969 cut through a drumlin and exposed freshwater silts, fine sands and organic material trapped between two sheets of glacial till. The lower till proves that ice had earlier affected the district; the upper till proves that ice later returned and sealed the wetland sediments. Between those advances, a cold but locally ice-free landscape supported pools, saturated ground, mosses, small animals and sparse tundra vegetation.

Organic material from the Derryvree bed produced the conventional radiocarbon determination BIRM-166, 30,500 +1,170/-1,030 radiocarbon years BP. Calibration converts that measurement into a much broader interval, approximately 36,900–31,700 calendar years BP in published syntheses. Thus 31,132 BCE may be discussed as lying within the wider environmental world illuminated by Derryvree, but it cannot be claimed as the date when a particular pool formed, a plant flowered or an animal passed through Fermanagh.

A Wetland Between Glaciers

Derryvree is valuable precisely because its sequence is physical rather than speculative. Till is debris laid down by glacier ice: a mixture of clay, sand, stones and boulders. The freshwater deposits above the older till demonstrate an interval in which the locality was free from overriding ice long enough for water and organic matter to accumulate. The later till records renewed glacial expansion. The site is therefore a rare Irish archive of change within the cold stage, preserved beneath the landscape-shaping action of the last Irish Ice Sheet.

The plant evidence points to open tundra or muskeg-like country, not forest. Pollen, though poorly preserved, is dominated by herbaceous types. Macrofossils include mosses and a seed of bogbean (*Menyanthes trifoliata*), a plant associated with wet margins and shallow water. Other evidence has been interpreted as indicating grasses, sedges, herbs and juniper amid pools, wet hollows and exposed mineral ground. This was not a uniformly barren white wilderness. It was a varied but severe environment: local water, low vegetation and patches of ground capable of sustaining cold-adapted life, surrounded by a broader periglacial landscape shaped by repeated freezing and thawing.

That reconstruction has limits. Fossil pollen and plant fragments reveal what grew in or near the deposit, not a complete map of Ireland. Nor should a modern visitor imagine an exact replica of any living Arctic landscape. The reasonable conclusion is narrower: south Fermanagh held an open, treeless and wet environment during part of MIS 3, and winter cold was intense. The Derryvree sediments provide a local window on a changing island, not a photograph of all regions at once.

Before the Great Expansion of Ice

At this horizon Ireland was approaching, rather than yet enduring, the maximum spread of the last British–Irish Ice Sheet. Geological chronologies differ in their regional detail, but they agree that the greatest Late Pleistocene ice extent came later, broadly during the Last Glacial Maximum. Western shelf evidence places maximum ice expansion offshore of Ireland at roughly 26,000–24,000 calendar years BP, while ice-sheet-wide reconstructions identify a maximum volume around 23,000 years BP. The distinction matters: the familiar image of Ireland entirely overwhelmed by ice belongs principally to a later phase, not automatically to every moment of the preceding cold stage.

Derryvree and the related lacustrine deposit at Greenagho, also in Fermanagh, establish that parts of north-central Ireland were ice-free during earlier intervals. They do not prove that every coast, upland and valley was simultaneously open. Ice sheets are dynamic systems, advancing, thinning and changing their flow paths across different sectors. In south-west Ireland, episodic cave calcite growth at Crag Cave independently suggests that conditions fluctuated sufficiently during MIS 3 for liquid water to percolate underground at particular times. Together, these records replace any simple story of a steadily advancing wall of ice with one of climatic pulses and regional variety.

For the people who would eventually inhabit post-glacial Ireland, the later ice sheet had a profound consequence: it eroded, buried and rearranged older surfaces, making evidence exceptionally difficult to find. At 31,132 BCE, however, the important development was environmental instability. Habitats were available intermittently; later glacial expansion would remove or conceal much of their trace. Ireland's deep past is consequently known through unusual survivals—buried wetlands, cave deposits, fossils, sediment cores and landforms—rather than through a continuous archaeological landscape.

Animals in the Open Country

The best evidence for larger animals comes chiefly from caves, especially Castlepook Cave near Doneraile in north County Cork. Its antiquarian excavations recovered an exceptionally large and complicated bone assemblage. Subsequent redating has shown that some earlier determinations were substantially too young, while confirming the presence in Ireland of an MIS 3 fauna. The cave produced remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. These species were not necessarily contemporaries within one deposit, and Castlepook is not a census of a single landscape. Its bones accumulated over a long span and were affected by carnivores, cave processes and early excavation methods.

Nonetheless, the assemblage establishes something important. Ireland supported a richer Pleistocene mammal community than its later historic fauna would suggest, including animals now associated with continental steppe-tundra, high latitudes or Africa. Spotted hyaenas almost certainly played a major role in gathering and modifying bones in the cave. Mammoth and reindeer indicate open country with extensive forage somewhere within their ranges; lemmings and Arctic fox reinforce the cold character of the wider environment. Giant deer, despite its later popular name “Irish elk”, was neither uniquely Irish nor an elk. It was a very large deer whose Irish fossils have become emblematic of the Ice Age.

Recent sedimentary ancient-DNA work at Castlepook adds a further, provisional line of evidence. It has identified ancient genetic material from several Pleistocene taxa and found affinities with wider west Eurasian populations. Because this work remains a preprint and cave deposits may be stratigraphically mixed, it should be treated as promising evidence rather than a final map of animal movements. Still, the broader conclusion is secure: Irish animal populations were not biologically isolated curiosities. They formed part of changing north-west European distributions before the maximum ice advance.

The Human Question

One Castlepook reindeer femur has made this period especially significant for Irish prehistory. The bone, recovered in 1972, has been dated to about 33,000 years ago and bears a deep linear mark interpreted by researcher Ruth Carden as a cut or chopping trace made with a sharp stone implement while the bone was fresh. If that interpretation is correct, it is evidence that humans processed a reindeer in Ireland during the Upper Palaeolithic—far earlier than the formerly accepted record of settlement.

Its implications must remain proportionate. This is one modified bone from an old cave collection, not an excavated campsite with hearths, stone tools, structures and repeated occupation layers. It does not establish that people lived permanently at Castlepook, hunted the animal there, maintained a local community or returned every year. The bone might record a short visit by a small mobile group, carcass processing elsewhere, or later movement of material within the cave. It is evidence for a possible human act, not proof of an inhabited Ireland in the modern sense.

Accordingly, there is no responsible basis for describing political authority, diplomacy, warfare, religion, language, art, formal learning, trade networks or domestic households in Ireland in 31,132 BCE. There are no known chiefs, communities, shrines, graves, monuments or exchange goods from this precise horizon. Nor can reindeer hunting be turned automatically into an Irish economy. If people were present, their activity was probably small-scale, mobile and embedded in wider north-west European movements; that is an interpretation drawn from the ecology of the period and the limited bone evidence, not a demonstrated social history.

A Landscape Without a Chronicle

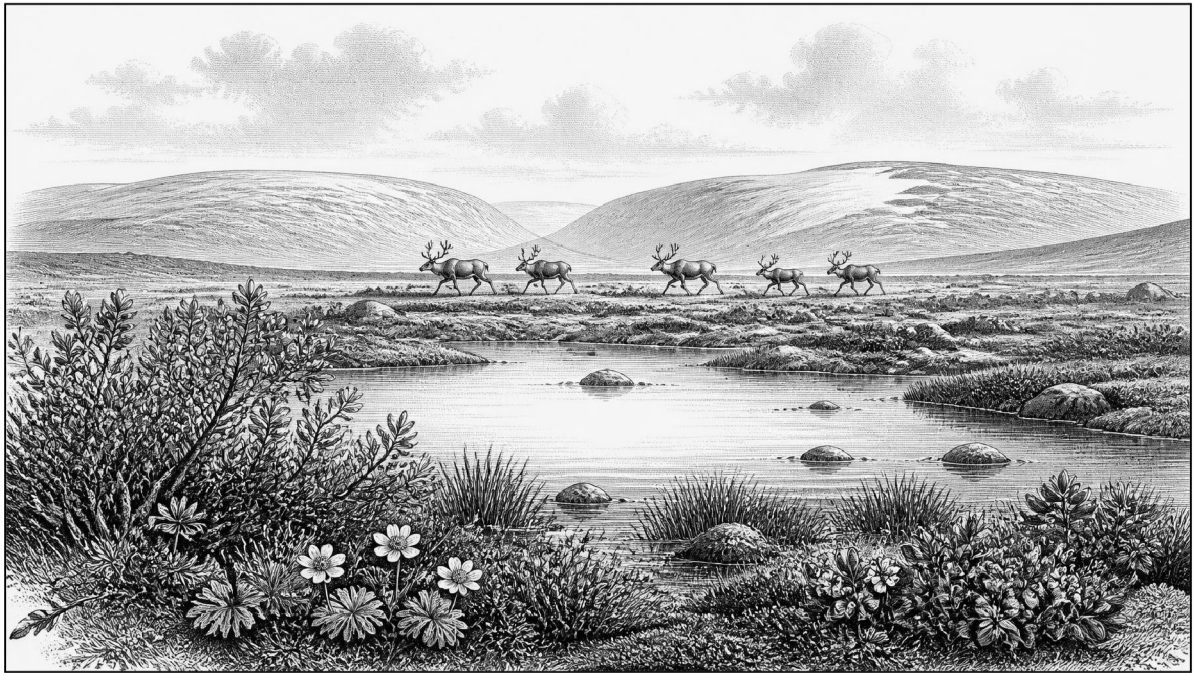
The most meaningful story for this notional year is therefore not of kingdoms or events, but of a vulnerable ecological interval. In Fermanagh, freshwater sediments accumulated in a cold wetland between glacial episodes. In Cork, caves preserved the remains of animals ranging from reindeer and mammoth to hyaena, and perhaps a trace of human carcass processing. Across the island, conditions were changing on scales of centuries and millennia, while the more extensive ice cover of the Last Glacial Maximum still lay ahead.

Derryvree gives this remote Ireland its clearest local texture: mossy ground, sedge-fringed water, sparse herbs, exposed soil and hard winters beneath an open sky. It also supplies the necessary caution. Modern calendar labels encourage an illusion of precision that the evidence cannot bear. What can be said is compelling enough: around the broad interval containing 31,132 BCE, Ireland was an intermittently habitable cold-stage landscape, ecologically connected to the wider world, rich in large mammals, and on the threshold of major glacial transformation.

Chapter 070 of 100

31131 BCE

Castlepook's Hyena-Reindeer World^[70]



The label 31,131 BCE is useful only as a modern point of reference. No community in Ireland recorded years, events or named individuals at this depth of time, and archaeology cannot identify what happened in one calendar year. In calendar terms the date is roughly 33,080 years before AD 1950, but the evidence is dated in broad radiocarbon and calibrated ranges, often with substantial uncertainty. The responsible subject, therefore, is not a supposed Irish “year” but Ireland during a changing Middle Midlandian, pre-Last Glacial Maximum landscape.

The most informative evidence comes from deposits that accumulated over centuries or millennia rather than from a moment: freshwater muds buried beneath later glacial sediments in County Fermanagh, and animal bones gathered in caves in north County Cork. Together they show that parts of Ireland supported cold-climate vegetation and a surprisingly varied large-mammal fauna before later ice-sheet growth destroyed, buried or reworked much of the earlier record. They do not reveal a settled nation, a political community or a continuous human population.

Dating a Calendarless Landscape

Radiocarbon ages are not calendar dates. They measure the remaining radioactive carbon in once-living material and must be calibrated against changing atmospheric carbon levels. At more than 30,000 years ago, calibration produces broad probability ranges rather than a precise anniversary. This matters especially at Derryvree, near Maguiresbridge, County Fermanagh. Organic, moss-rich freshwater mud there produced a conventional radiocarbon determination of about 30,500 years BP, with an uncertainty of more than a millennium. Calibrated discussions place the deposit broadly around 36,900–31,700 cal BP. The modern date 31,131 BCE falls within that wide window, but cannot be assigned to a particular season, pool, plant or animal preserved in it.

Derryvree's geological position is equally important. Its freshwater silts and sands lay between glacial tills: sediments left directly by ice. The sequence records an earlier glacial episode, then a period when the locality supported open-water and wetland life, followed by renewed ice advance. It is thus evidence for an ice-free or at least locally deglaciated interval in Fermanagh, not proof that all of Ireland was simultaneously free of ice, nor a map of the coast on one day. Regional conditions varied sharply across the island and changed repeatedly during the last glacial cycle.

A Fermanagh Tundra Wetland

The Derryvree fossils provide the clearest local picture. Plant remains include bogbean, mountain-avens, water-milfoil, dwarf willow and mosses. This combination supports an interpretation of a cold, open tundra or tundra-steppe mosaic, with shallow freshwater, damp sedge-rich ground and low woody vegetation rather than forest. Mountain-avens and dwarf willow are familiar Arctic-alpine plants; bogbean and water-milfoil show that freshwater habitats persisted within the cold landscape. Such evidence is more secure than any imaginative panorama: it establishes plants and wet conditions close to the former basin, while the broader reconstruction of surrounding vegetation remains an interpretation.

For animals, the environment implied difficult seasonal conditions but not lifelessness. Small mammals and beetle evidence from comparable Irish deposits, alongside the plant record, suggest ground that could be frozen for long periods, with a short growing season and exposed mineral soils. Streams, pools and marshy margins would have offered drinking water and vegetation during milder months. Wind, frost action and sparse plant cover probably made erosion severe. This was not the familiar green Ireland of later millennia. Yet it was a landscape with ecological niches, not simply a blank sheet of ice.

The Cave Record at Castlepook

Castlepook Cave near Doneraile, County Cork, is the principal Irish archive for the larger animals of this broader pre-maximum period. Excavations beginning in the early twentieth century recovered more than two thousand bones from its passages and chambers, including remains attributed to woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, with later cold-stage occurrences of Arctic fox, wolf and lemmings. Direct radiocarbon dates on individual bones show that the cave assemblage spans a long interval, approximately 45,700 to 19,950 years BP. It must therefore not be treated as a single herd, a single predator den or a snapshot of 31,131 BCE.

That qualification is central. Caves concentrate evidence through carnivore activity, animal deaths, water movement, roof fall, excavation disturbance and later redeposition. A hyaena may have carried part of a carcass into one chamber; a bear may have used another place at a different time; water could have moved bones long after death. Nevertheless, the Castlepook collection demonstrates that Ireland was reached by mammals now absent from the island, and that its southern limestone country formed part of a wider north-west European Ice Age ecological world.

The presence of spotted hyaena is particularly revealing. Hyaenas are both predators and scavengers capable of transporting, chewing and breaking bones, and their activity helps explain why caves are rich but complicated archives. Mammoth and reindeer remains indicate access to large herbivore populations, while giant deer and brown bear point to further diversity in suitable habitats. None of this proves that all these species met in one valley in the same year. It does, however, overturn any assumption that pre-maximum Ireland was uniformly barren or ecologically isolated.

People: A Serious but Unsettled Question

Human history at this date is much less certain than environmental history. A reindeer bone from Castlepook has been reported as bearing a deep linear mark interpreted as a fresh-bone cut or chop made by a sharp stone implement. Its suggested age, around 33,000 radiocarbon years BP, has raised the possibility that Upper Palaeolithic people processed an animal in Ireland far earlier than the previously accepted evidence for human activity. If further work confirms that interpretation, it would be a major indication of a short human visit during the broader pre-Last Glacial Maximum period.

But the distinction between possibility and demonstration must be retained. The dated animal bone does not, by itself, date the surface mark, identify its maker or establish a camp at Castlepook. No securely associated stone-tool assemblage, hearth, dwelling floor, human burial or repeated butchery area of comparable antiquity has been recovered there. Carnivore damage, sediment abrasion, breakage and the disturbed history of old cave collections all require careful exclusion. The securely dated butchered brown-bear patella from Alice and Gwendoline Cave, County Clare, is much later, in the terminal Pleistocene around 12,810–12,590 cal BP. It remains the firmer published benchmark for Upper Palaeolithic human presence in Ireland.

Movement Without States or Borders

At this time there is no evidence for Irish political affairs, warfare, diplomacy, leaders, territories or institutions. There is likewise no evidence for farming, villages, trade networks, formal religion, monuments, writing, art or schools. These absences are not merely gaps in a historical chronicle: the kinds of evidence needed to support such claims have not been found. If people did reach Ireland, the most cautious inference is of small, mobile hunter-gatherer parties operating within the much wider Upper Palaeolithic world of western Eurasia, not of a permanent and identifiable Irish society.

How animals, and potentially people, reached Ireland is also unresolved. Lower global sea levels altered the Irish Sea basin, but lower sea level did not automatically create a straightforward, durable land bridge. Ice margins, channels, rivers and coastlines changed repeatedly. Faunal movement may have occurred through temporary northern connections, across exposed coastal lowlands, by short water crossings, or by combinations of these routes. The cave fauna establishes connectivity of some kind; it does not settle the exact route, season or frequency of crossings.

The Approach of Greater Ice

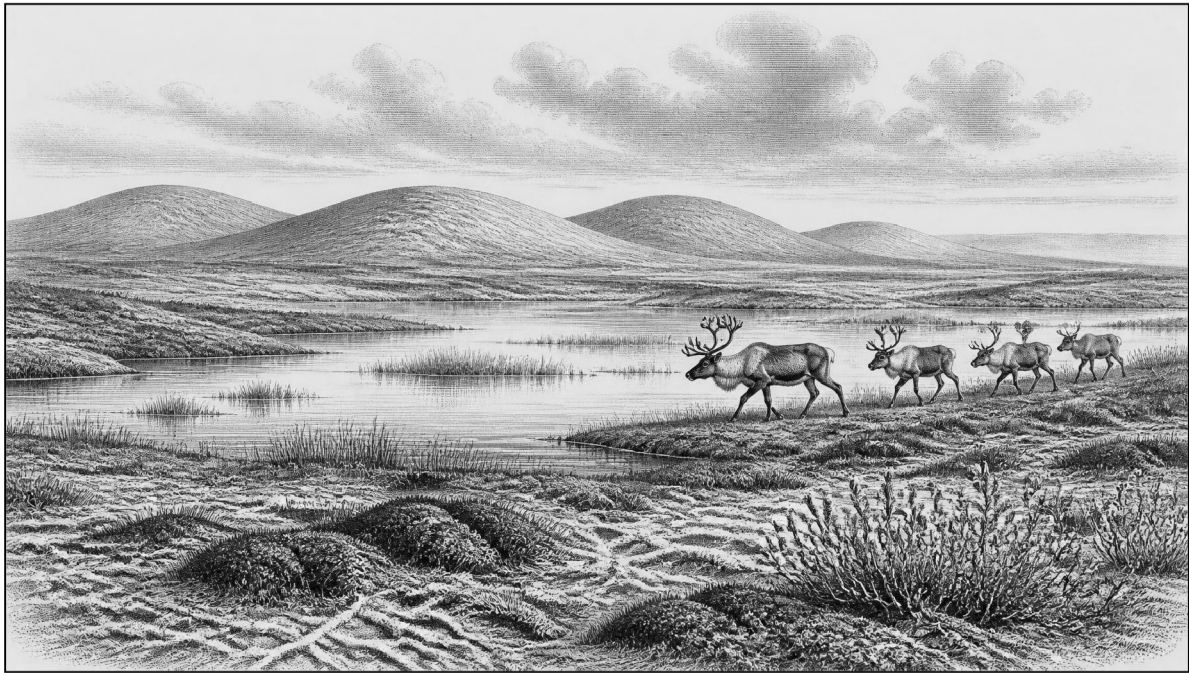
In the long view, the significance of this period lies partly in what followed. The British–Irish Ice Sheet expanded towards its Last Glacial Maximum after this broad interval, eventually covering or profoundly reshaping much of Ireland. Later glacier action scoured older land surfaces and left thick till, while changing rivers and coasts removed further evidence. That destructive history helps explain why Ireland's deep Palaeolithic record is so fragmentary compared with regions farther south and east.

For 31,131 BCE, then, the most defensible narrative is environmental. Fermanagh preserves a cold freshwater tundra wetland within a wide calibrated range that includes this modern year. Castlepook preserves a long, complex record of mammoths, reindeer, giant deer, bears and hyaenas in pre-maximum Ireland. Together they reveal an inhabited animal landscape at Europe's north-western edge, and perhaps—still only perhaps—a fleeting human encounter with it. They cannot responsibly supply kings, tribes, battles or a dated Irish event.

Chapter 071 of 100

31130 BCE

Mosses Below Maguiresbridge^[71]



Modern calendar-year precision is not available for Ireland in 31,130 BCE. No written chronology, settlement sequence or annually resolved environmental record can identify an event in this particular year. The date is a modern convention: it falls roughly 33,080 years before AD 1950, the reference point conventionally used in radiocarbon dating. The most responsible approach is therefore to place it within a broad calibrated interval and to distinguish direct evidence from interpretation. Ireland was then in the Late Pleistocene, within Marine Isotope Stage 3, a climatically unstable part of the last glacial cycle that preceded the later Last Glacial Maximum.

A Date Within a Long Cold Phase

The most relevant Irish evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. Road construction in 1969 cut through a drumlin and exposed an exceptional sequence: organic freshwater silts and fine sands lay between two substantial sheets of till, the unsorted sediment left by glacier ice. The order of events is secure even when the exact dates are not. Ice had first crossed the locality and deposited the lower till; later, glacier cover was absent long enough for water, sediment, plants and invertebrates to accumulate; finally, renewed ice advance laid down the upper till and sealed the wetland beneath it.

Eric Colhoun and his colleagues obtained a conventional radiocarbon age of 30,500 years BP from the Derryvree organic material, with a large laboratory uncertainty of +1,170 and -1,030 years. Calibration against changing atmospheric carbon levels produces a broad age range, commonly cited at approximately 36,900–31,700 calibrated years BP. The modern date of 31,130 BCE lies within that range,

but it does not identify the beginning or end of the deposit, nor a particular season in which its plants grew. Derryvree can illuminate conditions around this point in deep time; it cannot be made into a diary entry for a numbered year.

The terminology itself requires care. Older Irish schemes called this interval the Derryvree Cold Phase, within the Middle Midlandian, the Irish name for part of the last glacial period. The word “cold phase” is preferable to imagining an unbroken blanket of ice over the whole island. The buried wetland demonstrates that this Fermanagh locality was ice-free during part of the interval. It does not prove that all Ireland was ice-free simultaneously. Ice margins, upland glaciers, coasts and lowland basins could have differed sharply over relatively short distances and times.

A Freshwater Tundra

What survived at Derryvree is environmental evidence rather than an archaeological settlement. Its flora included freshwater mosses and sedges, while its insect fauna had a cold northern character. Pollen was poorly preserved, but the combined evidence indicates open, treeless ground with wet hollows and freshwater habitats: a periglacial landscape shaped by severe cold, seasonal freezing and brief growing seasons. It was not the familiar green, wooded Ireland of later prehistory. Nor was it necessarily a featureless snow desert. Mossy margins, sedge-rich shallows, pools, mineral ground and sparse herbaceous vegetation formed a patchwork in which living things could persist.

Related deposits strengthen that cautious reconstruction. At Hollymount, also near Maguiresbridge, and at Greenagho near Belcoo, organic sediments preserved between tills show that parts of Fermanagh experienced non-glacial cold conditions during the Middle Midlandian. Their chronologies are imperfect and should not be forced into a single, island-wide episode. Nonetheless, they demonstrate that wet ground and organic sediments could develop between major glacial advances. The value of these sites is precisely their local specificity: they show that northern Irish lowlands contained refuges of freshwater life during a long period otherwise poorly represented in the archaeological record.

Crag Cave in County Kerry offers a different kind of evidence. Its stalagmites formed only intermittently during the last glacial period, when liquid water could circulate through the shallow cave system. Uranium-series dates show that climatic ameliorations occurred repeatedly during Marine Isotope Stage 3. Such evidence does not make Derryvree warm; rather, it confirms that Ireland’s climate was highly variable on millennial scales. Cold conditions, modest thaws, renewed freezing and expanding ice belonged to the wider rhythm of the period.

Animals on a Changing Island

Southern Irish caves provide a complementary, though time-averaged, picture of animal life. Castlepook Cave near Doneraile in County Cork has yielded one of Ireland’s richest Pleistocene faunal collections. The assemblage includes remains attributed to reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Taken together, these animals reveal that Ireland was intermittently connected to wider north-west European ecological networks and could sustain cold-adapted grazers, predators and scavengers. Reindeer, lemmings and Arctic fox especially suit the open, cold conditions independently indicated at Derryvree.

Yet Castlepook must not be treated as a census for 31,130 BCE. Cave deposits can contain material accumulated across long spans of time, carried in by carnivores, water or people, and disturbed by later activity and early excavation. Improved radiocarbon procedures have also shown that some older dates

obtained from Irish cave fauna require reassessment. The sound conclusion is broad but important: a varied Ice Age fauna lived in Ireland during Marine Isotope Stage 3. It cannot establish that every species named above shared one valley, one season or one moment.

Sea level was lower than today, exposing large areas of continental shelf around north-west Europe and altering the shape of Ireland's coasts and surrounding seas. This helped make animal movements possible during suitable intervals, but it does not supply a mapped land bridge or a known route for any particular year. Glaciers, cold seas, estuaries and changing shorelines could all obstruct movement. The arrival of mammals is evidence that passages existed at some stages; it is not proof that Ireland was continuously accessible or that people travelled along the same routes.

The Human Question

Political affairs, diplomacy, kingdoms and organised warfare cannot responsibly be described for Ireland at this date. There are no named communities, leaders, monuments, cultivated fields, houses, toolkits or burials securely attributable to 31,130 BCE. There is equally no evidence for trade in the later prehistoric sense. If people visited Ireland, they would have been small, highly mobile Upper Palaeolithic hunting and gathering groups rather than a permanent farming population. That is an inference from the wider European context, not a demonstrated social history of this island.

A reindeer femur from Castlepook has brought that possibility into sharp focus. Reported in 2021 as bearing marks consistent with processing by a stone tool, it was presented as evidence of human activity in Ireland about 33,000 years ago. If that interpretation is confirmed through further taphonomic study and secure contextual work, it would indicate that people processed a reindeer carcass in Ireland during the early Upper Palaeolithic. It would not, however, demonstrate a village, a permanent population, a social hierarchy or continuous occupation. The bone derives from an old cave collection rather than a modern excavation of an undisturbed living surface, so caution is essential.

There is no defensible basis for assigning religion, language, artistic traditions or formal learning to Ireland in this year. European hunter-gatherers elsewhere made complex stone technologies, ornaments and cave art, but importing those achievements wholesale into Ireland would turn possibility into fiction. Fire, hides, meat, bone and antler may have been useful resources for any visitors, while reindeer and other animals could have structured seasonal movement. These are reasonable ecological possibilities, not evidence for an Irish camp at Derryvree or Castlepook.

Before the Major Ice Advance

At 31,130 BCE Ireland was not yet at the best-established maximum of the last British–Irish Ice Sheet. The major expansion came thousands of years later, with maximum extent in the Irish sector broadly around 25,000–23,000 years ago. Geological evidence increasingly depicts the earlier ice sheet as dynamic: it advanced, retreated and changed form rather than simply appearing everywhere at once. The Derryvree wetland belongs to this larger history of changing margins. Eventually, renewed ice covered its basin, deposited upper till and buried the evidence that now permits a glimpse of the landscape.

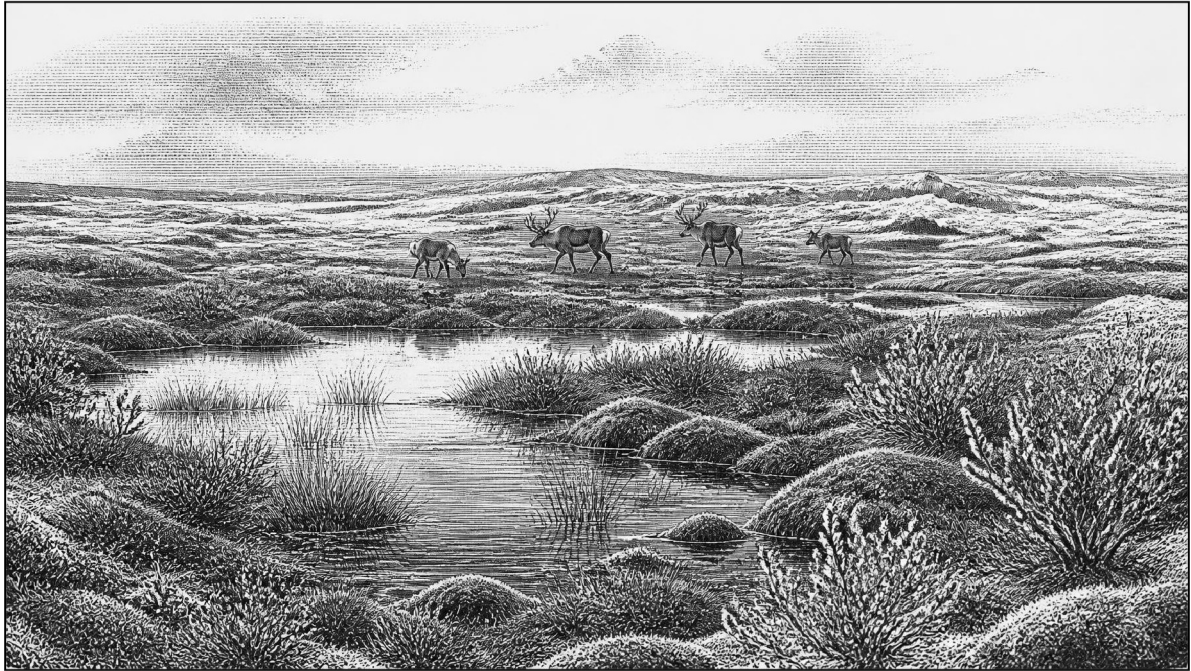
The principal history of this notional year is therefore not a royal succession or a battle, but the precarious persistence of life in a changing cold environment. Around the broad calibrated interval containing 31,130 BCE, part of Fermanagh supported freshwater mosses, sedges and cold-adapted insects beneath open skies. Elsewhere on the island, large mammals moved through landscapes that later ice would scour, bury or rearrange. Whether people briefly joined that animal world remains an important but

unresolved question. Derryvree's sediments make the firmer contribution: they preserve an Irish tundra wetland between episodes of ice, and they remind us how much of the earliest human and environmental past survives only by geological accident.

Chapter 072 of 100

31129 BCE

A Cutmark Near Doneraile^[72]



The label 31,129 BCE gives an impression of precision that the evidence cannot sustain. No written record, calendar, named community or securely dated human event survives from Ireland at this depth of time. In modern chronological terms, the year corresponds roughly to 33,078 years before AD 1950, the conventional ‘present’ used in radiocarbon reporting. It falls within Marine Isotope Stage 3, a long, climatically unstable part of the Last Glacial Period, before the Last Glacial Maximum covered much of Ireland with ice. The responsible history of this moment is therefore a history of deposits, animal bones, pollen, insects and landforms: evidence that can establish broad environmental conditions and occasional animal presence, but only rarely human action.

A Date Within a Wide Range

The best Irish environmental evidence relevant to this nominal year comes from Derryvree near Maguiresbridge, County Fermanagh. Road works exposed fine sands and organic silts trapped between two layers of till, the unsorted material laid down directly by glacier ice. Their order is important. An earlier glacier had occupied the locality; then water, plants and sediment accumulated in an ice-free interval; finally, a later ice advance sealed the freshwater deposits beneath new till. Later glaciation destroyed or disturbed much of Ireland’s older surface record, so this buried sequence is unusually valuable.

The Derryvree organic material produced radiocarbon determination Birm-166, conventionally reported as 30,500 radiocarbon years BP, with a substantial uncertainty of roughly a millennium. Radiocarbon years are not calendar years: atmospheric carbon-14 has varied, and dates must be calibrated against independently constructed curves. Modern discussion consequently places the Derryvree deposits

broadly around 36,900–31,700 calibrated years BP, approximately 34,950–29,750 BCE. The nominal year 31,129 BCE lies within that broad range. It cannot, however, identify the precise year in which a particular plant flowered, a pool formed, or an animal passed through Fermanagh.

This is not a defect in the archaeology; it is its proper scale. The sequence records an environmental interval, accumulated over time at one locality. It supports neither a claim that all Ireland looked exactly the same nor a year-by-year narrative. It does show that, during part of this pre-maximum cold phase, the Derryvree area was free of local glacier ice and supported a cold freshwater landscape.

Open Water, Moss and Tundra

The silts, plant macrofossils, pollen and insect remains at Derryvree point to an open, treeless tundra or muskeg environment. Grasses and sedges were prominent, alongside herbs, juniper and a rich moss flora. Fossil evidence includes plants associated with cold, wet ground and shallow freshwater, among them dwarf willow, lesser clubmoss and bogbean. Beetles and other invertebrate traces indicate wet ground with open pools and abundant decaying plant matter. This was not the familiar green, wooded Ireland of later millennia, nor necessarily a wholly barren snowfield. It was a patchwork of marsh, shallow water, mossy ground and sparse low vegetation shaped by frost, harsh winters and short growing seasons.

Such evidence reveals everyday ecological processes rather than human society. Water could collect where drainage was impeded; seasonal thaw and refreezing affected soils; plants had to tolerate exposure and cold. The climate was variable on scales far beyond a human lifetime. North Atlantic and Greenland records show abrupt shifts between relatively milder interstadials and colder stadials during this part of the Ice Age. Ireland's position on the Atlantic edge did not remove it from those swings. Derryvree is best understood as one local window onto a changing northern landscape, not a static portrait.

Before the Ice Sheet's Maximum

At 31,129 BCE, Ireland had not yet reached the Last Glacial Maximum, when the British–Irish Ice Sheet expanded across much of the island and far onto the surrounding continental shelf. Research on the western offshore record places the maximum advance much later, broadly after 26,400 years ago and with retreat under way before about 24,400 years ago. The difference matters. The landscape relevant to this article belonged to an earlier, cold phase in which ice margins, periglacial terrain, wetlands and open country could coexist across different regions and at different times.

Sea level was far lower than today because vast quantities of water were held in continental ice sheets. Ireland's present coastline did not exist, and the Irish Sea basin was a markedly different physical setting. Yet it would be unsafe to turn low sea level into a simple map of a dry land bridge or an easy route for people. The changing positions of ice, water, coast and exposed shelf are still debated, and physical connection is not the same thing as regular travel. What can be said is that Ireland was part of a wider north-west European zone through which animals could disperse during favourable intervals.

The Castlepook Fauna

About 250 kilometres south-west of Derryvree, Castlepook Cave near Doneraile in County Cork preserves Ireland's richest known assemblage of pre-Last Glacial Maximum vertebrate remains. Its deposits have yielded woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare,

collared lemming, Norwegian lemming and spotted hyaena. The list conveys a cold, open-country fauna, but it must not be read as though every species stood together on one day. Cave deposits accumulated over long periods, and carnivores, water movement, excavation history and later disturbance complicate their interpretation.

Spotted hyaena is especially significant. Hyenas could drag or carry bones into caves, chew them and leave droppings; a bone in a cave therefore need not be evidence of a human meal, camp or burial. Mammoth and reindeer remains show that large herbivores reached Ireland during suitable phases, while predators and scavengers followed or exploited the same animal communities. Their presence suggests food webs based on open vegetation, but it does not permit firm estimates of animal numbers, migration routes or seasonality for the precise year in question.

Improved accelerator radiocarbon methods have also changed the chronology. Re-dating has shown that some earlier Irish cave dates were too young, partly because of limitations in the preparation of old bone samples. Castlepook material now demonstrates that elements of this fauna occupied Ireland during Marine Isotope Stage 3, and that giant deer and spotted hyaena may have disappeared locally before the later ice maximum. The lesson is methodological as well as historical: old collections remain indispensable, but their dates and contexts need continual testing.

The Reindeer Bone and the Human Question

Castlepook matters to human history because a reindeer femur has been reported to carry a deep fresh-bone incision interpreted as the mark of a sharp stone tool used in carcass processing. Public heritage accounts associate the bone with an age of about 33,000 years ago, close to the nominal date considered here. If the mark is confirmed as a cut or chop made during butchery, it would be remarkable evidence that people handled a reindeer in Ireland during the Middle Upper Palaeolithic.

That possibility must be stated carefully. The bone itself is evidence for a reindeer; the interpretation of its surface mark is a separate zoological and taphonomic judgement. Castlepook's old cave collection came from complex deposits, and no securely associated stone-tool assemblage, hearth, occupation surface, dwelling, burial or human skeleton of comparable age has been recovered there. Nor does one modified bone demonstrate permanent settlement, a population of any size, a language, ancestry or political territory. A brief visit by mobile hunters, scavengers or small parties remains an inference rather than an established narrative.

The European context makes such a visit plausible without making it certain. *Homo sapiens* groups elsewhere in north-west Europe were highly mobile hunter-gatherers able to exploit large game and seasonally changing resources. Reindeer could provide meat, fat, hide, sinew, bone and antler. But Ireland has not produced the campsites and tool scatters needed to reconstruct those practices locally. The much later butchered brown-bear bone from Alice and Gwendoline Cave in County Clare offers stronger evidence for human presence during the terminal Pleistocene, around 12,890–12,678 calibrated years BP, but it cannot fill the far older evidential gap at Castlepook.

No Politics, No Proven Institutions

There is no evidence from Ireland around this date for political affairs, diplomacy, organised warfare, formal religion, permanent settlements, agriculture, trade networks or named peoples. It would be misleading to invent them merely because contemporary hunter-gatherers elsewhere had social lives,

beliefs and practical knowledge. People, if present, certainly possessed culture and learned skills; every stone-tool cut would itself imply technical knowledge. But no Irish object or site presently permits a responsible account of ritual, leadership, exchange or family organisation in 31,129 BCE.

The archaeological emphasis belongs instead to environmental opportunity and uncertainty. The Derryvree wetlands show that life persisted in a severe periglacial setting. Castlepook shows that substantial mammals and carnivores entered the island during parts of the same broad period. The marked reindeer femur raises the prospect of human contact with that world. Together, these fragments give Ireland a deeper Palaeolithic horizon than older histories allowed, while also reminding us how little survives from a landscape repeatedly altered by ice.

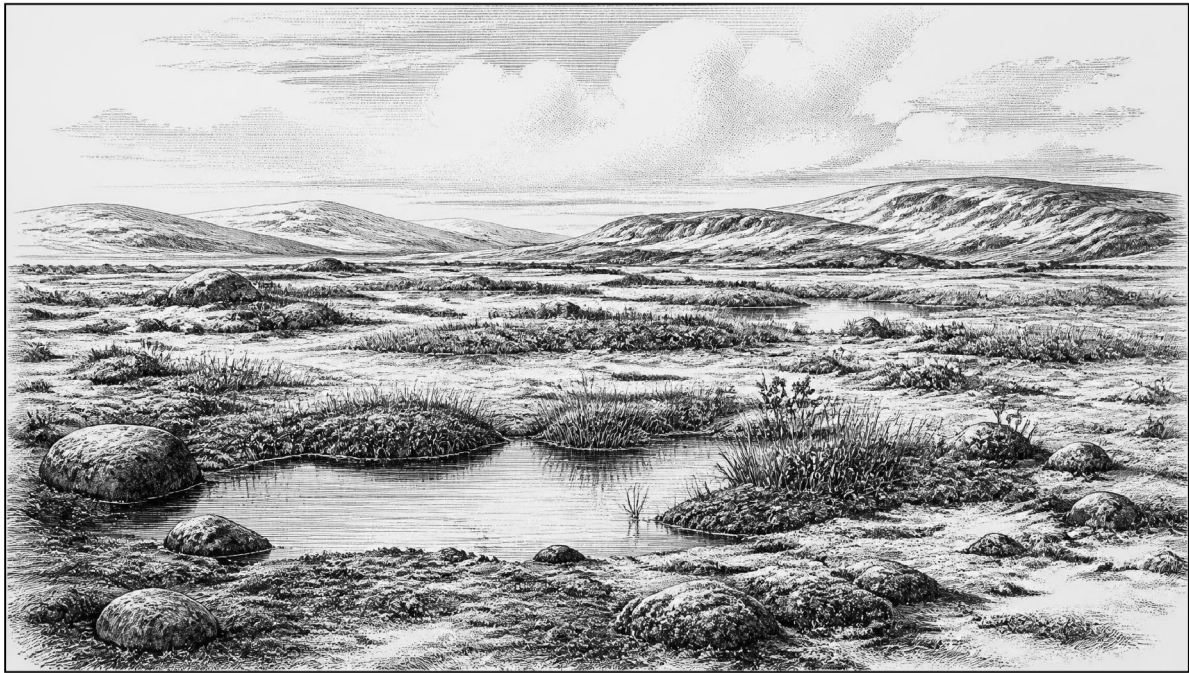
A Landscape Rather Than a Chronicle

Ireland in 31,129 BCE was not yet a historical society in the documentary sense. It was a changing Ice Age landscape: cold, open, wet in places, inhabited by specialised plants and intermittently by striking animals. Derryvree's sealed freshwater sediments and Castlepook's cave fauna are the principal witnesses. They support a vivid but restrained conclusion: long before later Ireland's farms, monuments and kingdoms, the island formed part of a dynamic Pleistocene world in which reindeer, mammoths, hyaenas and perhaps small groups of people could briefly share the same northern margin.

Chapter 073 of 100

31128 BCE

Sedges Beneath Maguiresbridge^[73]



Modern calendar-year precision is not available for Ireland in 31,128 BCE. The label is a retrospective convenience, roughly 33,077 calendar years before AD 1950, the conventional archaeological “present”; it is not a contemporary Irish date, and it cannot identify anything that happened in one particular year. No written record, named person, settlement, ruler or annual sequence survives from this depth of time. The responsible subject is instead a broad Late Pleistocene interval, within Marine Isotope Stage 3, reconstructed from sediments, fossil plants, animal bones and the changing history of ice.

The closest Irish evidence is measured in wide ranges. At Derryvree near Maguiresbridge, County Fermanagh, organic freshwater sediments produced a conventional radiocarbon determination of $30,500 \pm 1,100$ radiocarbon years BP. Calibration converts a radiocarbon measurement into a calendar-age probability range rather than a single date; published treatments place the deposit broadly at about 36,900–31,700 calibrated years BP. Thus 31,128 BCE falls within the general environmental horizon illuminated by Derryvree, not at a known beginning or end of it. At such antiquity, even carefully measured dates must be read with their uncertainties, sample histories and later revisions in view.

Evidence Between Two Ice Sheets

Derryvree became important in 1969, when roadworks cut through a drumlin, exposing fine sands, silts and organic material caught between two thick sheets of till. Till is the unsorted mixture of rock, clay and debris laid down by glacier ice. The sequence therefore preserves a compelling local history: an earlier glacial advance, an interval in which water and organic matter accumulated, and a later advance that buried the record beneath fresh ice-borne sediment.

This does not mean that all Ireland was ice-free on the same day, or that the Derryvree hollow was continuously open throughout the interval. It does, however, disprove the simple image of an island uniformly entombed beneath permanent ice. The sediments record a time when this part of Fermanagh supported an unfrozen freshwater environment. Other northern deposits, including material at Greenagho near Belcoo, contribute to the case that north-central Ireland retained ice-free ground until at least about 34,000 years ago, before the major build-up of the last Irish Ice Sheet. The precise limits and timing remain debated because later glaciers eroded, mixed and covered much of the earlier evidence.

That debate matters particularly around this notional year. The British–Irish Ice Sheet did not grow as a single, evenly advancing white blanket. Its sectors responded differently to snowfall, temperature, terrain, marine margins and the changing North Atlantic. Modern reconstructions place the large-scale growth phase after roughly 35,000–32,000 years ago and the overall maximum much later, around 27,000–21,000 years ago. Around 31,128 BCE, Ireland was approaching a decisive glacial expansion, but evidence does not support treating the whole island as already locked beneath its maximum ice cover.

A Cold Freshwater Landscape

The biological evidence at Derryvree gives this remote interval texture. Fossil pollen, plant remains, mosses and insects point to open tundra or periglacial wetland rather than the wooded island familiar today. Sedges and freshwater mosses grew where shallow, slow-moving or standing water persisted. A fossil seed of bogbean, *Menyanthes trifoliata*, is especially vivid proof that wet ground and open water existed despite the cold. The wider assemblage includes plants associated with Arctic and alpine settings, while insects indicate northern climatic conditions.

“Tundra” should not be imagined as a featureless expanse of snow. The Fermanagh evidence suggests a mosaic of sedge margins, moss-rich saturated ground, shallow pools, exposed mineral soil and sparsely vegetated drier patches. Summers may have been brief, but they were sufficient for freshwater plants, insects and organic sediments to accumulate. Long winters, frost heave and seasonal thaw would have shaped the ground. Any river channels, pools and vegetated hollows would have been crucial concentrations of water and forage in an otherwise exposed country.

Nor should one small basin be promoted into a complete map of Ireland. Derryvree provides compelling evidence for its own locality and a valuable window onto comparable cold-stage environments; it does not tell us the weather at every coast, upland or valley. Low global sea levels altered shorelines and exposed areas of continental shelf, but the geography between Ireland, Britain and continental Europe was conditioned by changing sea levels, ice margins and local land deformation. It is unsafe to claim a simple, permanent land bridge or a known overland route at this date.

Animals in a Changing Island

Castlepook Cave near Doneraile in north Cork offers the most important southern Irish archive for the animal world of the broader period. Its collections include remains of reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. These finds demonstrate that Irish habitats could support a cold-adapted fauna and, at times, large grazers and their predators. They do not establish that every listed species shared one landscape at one moment. Cave deposits accumulated over long spans, and bones may have entered through carnivore activity, natural deaths, water movement and disturbance.

That qualification is essential. Castlepook was extensively excavated in the late nineteenth and early twentieth centuries, when recording methods did not meet modern archaeological standards; many bones were removed and context was often lost. The Irish Quaternary Fauna Project later used radiocarbon dating to show that mammals had reached Ireland across a broad period from at least about 45,000 to 20,000 radiocarbon years ago. More recent work has also shown that some older determinations require reassessment because improved collagen pretreatment and ultrafiltration can produce substantially older results. A cave bone's printed date is therefore evidence under review, not a fixed timestamp for a single Irish scene.

Even with these limits, the faunal record corrects an older assumption that Pleistocene Ireland was simply empty before the final ice advance. Open vegetation and wetlands could provide forage for herbivores; carcasses would in turn attract scavengers and predators. Animal movement was not trade, nor was it evidence for human settlement, but it shows Ireland as part of a wider north-west European ecological zone rather than an isolated void.

The Reindeer Femur Question

The period has unusual archaeological importance because a reindeer femur from Castlepook has been reported as bearing a deep mark interpreted by zooarchaeologist Ruth Carden as damage caused by a sharp stone tool while the bone was fresh. Public heritage accounts have associated the specimen with an age of roughly 33,000 years and have suggested carcass processing by Upper Palaeolithic people. If the mark is confirmed as human-made and contemporaneous with the animal's death, it would indicate a remarkably early human visit to Ireland.

It cannot, however, bear the weight of an invented settlement history. The bone derives from an old cave collection rather than a modernly excavated occupation floor. A date on bone principally dates the animal's death; deciding whether a surface mark was made by a stone tool is a separate taphonomic judgement. Carnivore teeth, trampling, sediment abrasion, excavation damage and later handling can all complicate interpretation. No securely associated stone-tool assemblage, hearth, dwelling, burial, artwork or human remains demonstrates a resident community in Ireland at this time. Renewed excavation at Castlepook has sought surviving Pleistocene deposits precisely because securely stratified evidence is needed.

The prudent conclusion is consequential but narrow. Brief human presence is possible, perhaps involving mobile people exploiting or processing an animal; permanent occupation is unproven. Such visitors, if they came, cannot responsibly be called Irish in an ethnic, linguistic or political sense. Nothing identifies their language, social identity, route of arrival or relationship to later populations. Comparisons with hunter-gatherers elsewhere in Upper Palaeolithic Europe may suggest possibilities, but they cannot supply facts absent from Ireland.

No Kings, Markets or Monuments

For political affairs, conflict and diplomacy, the evidence is silence. There are no Irish rulers, tribes, alliances, territorial boundaries, battles or laws to describe in 31,128 BCE. Terms such as kingdom, chiefdom and nation would impose much later social forms on a fragmentary environmental record. Likewise, there is no evidence for farming, domestic animals, cultivated crops, villages, mines, markets or organised long-distance trade. The economy visible in the evidence is ecological: water, vegetation, grazing animals, predators and the seasonal constraints of a cold landscape.

Religion, culture and learning must be treated with the same restraint. Ireland has no demonstrated shrine, burial rite, cave art, musical instrument, monument or formal tradition from this horizon. If people visited, they certainly possessed knowledge needed to survive in a demanding Ice Age world, but that knowledge has not been recovered archaeologically in Ireland. The absence of evidence does not prove an absence of belief or social life; it establishes only what present evidence can and cannot support.

A Buried Ecological History

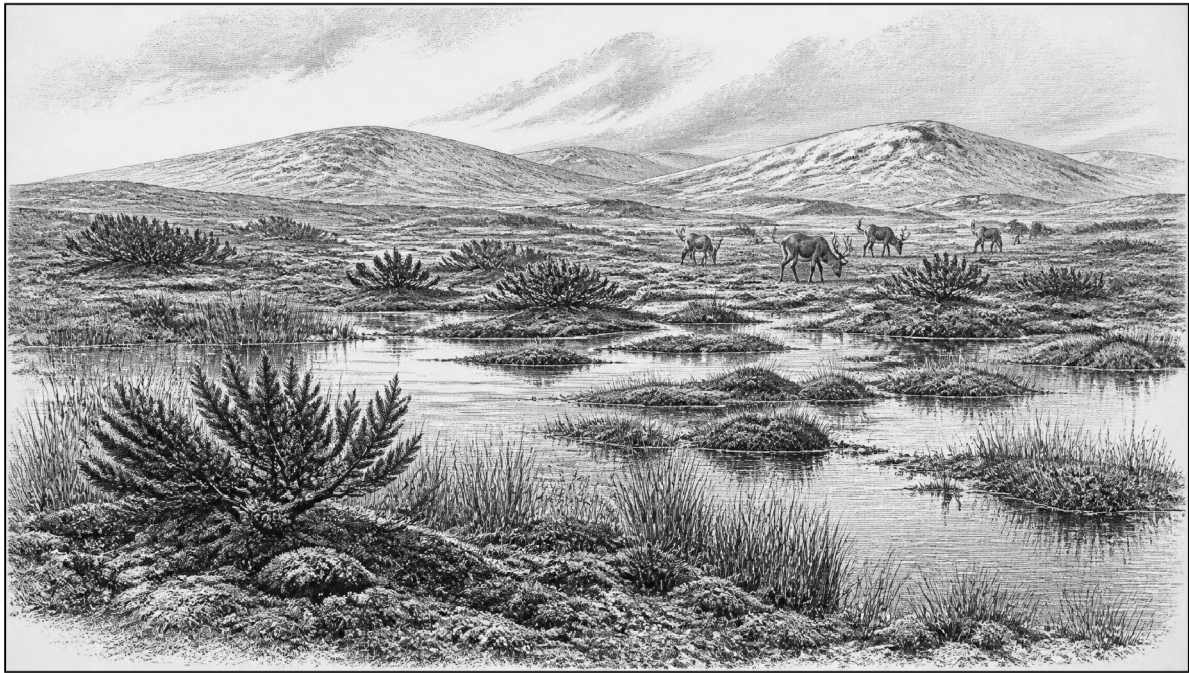
The chief development illuminated around 31,128 BCE was environmental. In parts of Ireland, cold but productive ground included freshwater hollows and treeless vegetation, while the great ice advance that would later reshape the island was gathering force. Derrynree preserves that world beneath a drumlin: mosses, sedges, aquatic plants and insects sealed between glacial deposits. Castlepook adds an animal record of exceptional richness and an unresolved question about the earliest human contact.

This is not a lesser history because it lacks named actors. It is the deep history of conditions: a changing climate, mobile fauna, intermittent habitable ground and the destructive power of later ice. Its proper narrative is not an annual chronicle, but a carefully bounded reconstruction in which the sediments and bones say much about Ice Age Ireland, while refusing to say more than they can sustain.

Chapter 074 of 100

31127 BCE

Hyenahall's Fanged Archive^[74]



A Calendar Label, Not a Dated Year

“31,127 BCE” is a modern calendar label, not a year that can be recovered from the Irish archaeological record. No writing, settlement sequence or scientific measurement permits events in Ireland to be fixed to a particular twelve-month period so far back. The date corresponds approximately to 33,076 calendar years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), an unstable phase of the last Ice Age. It is therefore more responsible to describe a broad environmental and archaeological horizon than to invent a ruler, battle, migration or local incident.

The closest especially useful evidence comes from Derryvree near Maguiresbridge, County Fermanagh. Organic material there produced the radiocarbon determination BIRM-166, conventionally dated to 30,500 radiocarbon years before present, with a substantial laboratory uncertainty. Radiocarbon years are not calendar years: atmospheric carbon-14 has varied over time, so measurements must be calibrated against internationally maintained curves. Published treatments place the Derryvree deposit broadly at about 36,900–31,700 calibrated years before present, roughly 34,950–29,750 BCE. The assigned year lies within that wide span, but it cannot be attached to a particular season, animal, human visit or event.

This distinction is not a technical footnote. It determines what can honestly be said. Ireland around this point was part of a changing north-west European world, but its evidence is thin, locally preserved and unevenly dated. The story is written in buried mud, pollen, seeds, insects, cave bone and glacial sediment rather than in chronicles.

Derryvree Between the Tills

Roadworks at Derryvree in 1969 cut through a drumlin, exposing a remarkable sequence. Beneath one mass of till – the unsorted clay, stones and debris deposited by glacier ice – lay freshwater silts, fine sands and organic mud. Another till sealed the deposit above. The order records a large environmental rhythm: ice had crossed the district; afterwards, open water and wet ground persisted long enough for sediment and vegetation to accumulate; later ice advanced and buried the wetland.

That sequence does not mean that all Ireland was ice-free at once, nor that Fermanagh's conditions prevailed unchanged from Cork to Donegal. It does, however, show that this part of the island experienced an interval without glacier cover before the great expansion of the last British–Irish Ice Sheet. Later ice was destructive as well as depositional, scouring away many older land surfaces and leaving the surviving records fragmented. Derryvree matters precisely because its organic layer was protected beneath later glacial material.

The plants and small creatures trapped in its sediments point to a cold, open, largely treeless wetland or muskeg-like setting. Grasses, sedges, herbs, juniper and mosses are more appropriate to the reconstruction than later Irish woodland. A seed of bogbean (*Menyanthes trifoliata*) is particularly eloquent evidence for freshwater margins. Insect remains and aquatic material indicate pools, saturated ground and plant-rich shallow water. Such findings support a picture of low vegetation broken by wet hollows and channels, with local shelter and water making small ecological refuges possible even in a severe climate.

“Tundra” is a useful shorthand, provided it is not imagined as a featureless snowfield. The evidence suggests a patchwork of damp vegetation, open pools, exposed mineral ground and seasonally frozen soils. Winters were probably harsh and biological productivity limited; summers could nevertheless sustain mosses, sedges and aquatic plants. The landscape was unfamiliar in appearance but not lifeless.

An Island Before the Maximum Ice

At this time Ireland was not yet at the Last Glacial Maximum, the later phase when ice expanded extensively across the island and onto surrounding shelves. The maximum extent of the last British–Irish Ice Sheet is generally placed thousands of years after the Derryvree interval, principally within MIS 2 rather than MIS 3. This matters because the phrase “Ice Age Ireland” can otherwise imply permanent, uniform ice cover. The geological evidence instead records advances, retreats and ice-free or less glaciated intervals, differing by region.

Climate across the North Atlantic was also highly variable on millennial scales. Greenland ice cores register abrupt shifts between colder stadial and relatively milder interstadial conditions. Irish deposits cannot automatically be matched to a single Greenland event, since their chronological resolution is far lower and regional responses could lag or differ. Yet Derryvree's freshwater sediments, together with episodes of speleothem growth in Crag Cave, County Kerry, fit the wider conclusion that the later Ice Age was punctuated by environmental change rather than an unbroken deep freeze.

Sea levels were lower than today because much water was held in global ice sheets. Ireland's precise coastlines and connections to Britain shifted through the Pleistocene, but there is no basis for drawing a simple, fixed land bridge across the Irish Sea for this particular date. Animal and possible human movements must be considered against changing seas, exposed shelves and short sea crossings, not assumed from a modern map.

Cave Bones and Predators

Southern Ireland offers another, very different archive. Castlepook Cave, also called Mammoth Cave, near Doneraile in County Cork, is the richest known Irish site for vertebrate remains from the period leading towards the Last Glacial Maximum. Excavations recovered more than 2,000 bones. Radiocarbon dates from individual remains cover a long interval, approximately 45,700 to 19,950 years before present. The cave is consequently evidence for a broad cold-stage animal world, not a photograph of one moment in 31,127 BCE.

Its fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyena; later material also includes Arctic fox, wolf and lemmings. The range demonstrates that Ireland was reached by mammals adapted to cold, open country, alongside formidable predators and scavengers. A spotted-hyena skull from the cave is held by the National Museum of Ireland. Hyenas are especially important because their bones, droppings and feeding behaviour complicate interpretation: caves can be dens, traps, shelters, water-transported repositories and places where carnivores carried prey remains.

Thus a bone in a cave does not straightforwardly record a local hunt, a dwelling or even the exact spot where the animal died. It does show that Ireland formed part of wider ecological routes in which large herbivores and carnivores could move through, or periodically occupy, suitable landscapes. Reindeer in particular evoke a mobile grazing resource, but the Irish record cannot establish the size, regularity or routes of herds in any individual year.

The Human Question

The most provocative object from Castlepook is a reindeer femur bearing a deep surface mark interpreted by some researchers as a cut or chop made on fresh bone with a sharp stone tool. Its reported antiquity has encouraged the possibility that people reached Ireland around 33,000 years ago. If the mark is anthropogenic, it would be an important indication of carcass processing during the Upper Palaeolithic era.

But the limits of the claim are as important as its excitement. The bone's date is the date of the animal, not automatically that of a human action. The cave deposits have been disturbed by water, animals and earlier excavation, and Ireland has not produced a securely excavated camp, hearth, house floor, human bone or unequivocal contemporary stone-tool assemblage for this horizon. A single modified bone, even if the interpretation proves correct, would indicate a visit or episode of butchery; it would not demonstrate permanent settlement, a resident population or continuous occupation.

Accordingly, political affairs, diplomacy, warfare and institutions are beyond the evidence. There are no named communities, chiefs, territories, alliances or conflicts. Nor is there secure evidence for religion, ritual, art, language or formal learning. It is possible that visiting hunter-gatherers elsewhere in north-west Europe possessed rich social knowledge, technical traditions and beliefs, but these cannot responsibly be assigned to Ireland without Irish evidence.

Subsistence Without a Society

Economy and everyday life can only be discussed conditionally. The wetland and cave records show resources that people could have used if they were present: reindeer and other mammals, freshwater, plant materials and sheltered limestone terrain. They do not prove that these resources were harvested, traded or

managed by humans in Ireland. No evidence supports farming, metalworking, pottery, long-distance commerce or settled villages. The conventional language of economy should therefore give way to ecology: animal movement, forage, predation, water and seasonal survival.

There was likewise no Irish political map. The meaningful regional change was environmental. In Fermanagh, a freshwater tundra wetland accumulated between glacial episodes. In Munster, cave assemblages preserve an unexpectedly diverse cold-stage fauna. Around the island, later ice would remould hills, plains and drainage, while lower seas changed the wider setting through which animals – and perhaps occasional people – might travel.

The most important development around this notional date was not an event recorded in a year. It was the persistence of life in a cold and volatile Irish landscape before the last ice sheet reached its fullest extent. Derryvree's plants and pools, and Hyenahall's bones, make that landscape tangible. They also impose discipline: the evidence permits a rich ecological history, but not an invented human chronicle.

Chapter 075 of 100

31126 BCE

Fermanagh's Wetland Interlude^[75]



The label 31,126 BCE gives a useful position in a modern timeline, but it does not describe a year that anyone in Ireland could have named or recorded. There is no written history, calendar, settlement sequence or securely dated event that can be fixed to this particular point. In archaeological terms it is approximately 33,075 years before AD 1950, the conventional present used in radiocarbon chronology. The responsible approach is therefore to examine broad, calibrated ranges and physical evidence rather than inventing a political episode or a prehistoric biography.

This was the Late Pleistocene, within Marine Isotope Stage 3: a severe and climatically unstable part of the last Ice Age, before the Last Glacial Maximum. Ireland was not yet uniformly buried beneath the later great ice sheet. Its landscapes and coastlines were changing in response to colder conditions, lower sea level, shifting snowfields and expanding ice. The evidence is fragmentary because later glaciers eroded, displaced and buried much of what had existed. Yet a few sites, especially in County Fermanagh and north County Cork, allow a careful reconstruction of an Ireland of open country, freshwater hollows and large mammals.

A Date Within a Wide Range

The most important Irish evidence relevant to this date comes from Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and exposed fine sands and organic freshwater silts enclosed between two thick deposits of till: the mixed sediment laid down directly by glacier ice. The order of the layers is decisive. Ice had first crossed the locality and deposited the lower till. A later non-glacial interval allowed water, sediment, plants and small animals to accumulate. Then a renewed ice advance sealed the wetland beneath the upper till.

Organic material from the Derryvree bed yielded a conventional radiocarbon determination of about 30,500 radiocarbon years before present, with a substantial uncertainty. Later calibration has placed the deposit broadly at about 36,900–31,700 calibrated years BP, or roughly 34,950–29,750 BCE. The modern date 31,126 BCE falls inside that wide interval. It cannot, however, identify the precise year in which a particular pool existed, a seed was shed or an animal passed by. The deposit is evidence for an environmental phase, not a dated annual chronicle.

Nearby Greenagho, near Belcoo in County Fermanagh, provides an older but complementary indication that north-central Ireland retained ice-free ground before the later expansion of the last Irish Ice Sheet. Together, such sites make a narrow but important point: Ireland's transition towards full glacial conditions was neither instantaneous nor geographically uniform. At the time represented by the Derryvree range, at least some lowland areas could sustain wet ground and tundra-like vegetation even as colder conditions increasingly constrained life.

Water Beneath the Drumlin

Derryvree is particularly valuable because it preserves biological remains as well as sediment. Plant macrofossils, pollen, mosses and beetle remains indicate a cold, open and largely treeless environment. Sedge-rich wetland, mossy ground and shallow freshwater pools were embedded in a broader periglacial landscape: one shaped by repeated freezing and thawing close to an ice margin. The fossil record includes bogbean, *Menyanthes trifoliata*, an aquatic plant of marshes and slow water, as well as dwarf willow, mountain-avens and other plants suited to exposed cold conditions.

This should not be imagined as a featureless white desert. In favourable hollows, water could remain available during the growing season; plants rooted in saturated sediment; insects found food and shelter; and birds or mammals could have used the surrounding ground. But nor was it a forested Ireland of later millennia. The assemblage points to sparse vegetation, short productive summers, severe winters and a landscape in which local shelter mattered greatly. The apparent contrast between wet pools and frost-hardened open ground is one of the clearest impressions supplied by the evidence.

The ecology is reconstructed from proxy evidence, rather than observed directly. A seed establishes that a species grew nearby or was transported into the deposit; beetle remains illuminate habitat and temperature tolerances; pollen suggests vegetation at a wider scale. None yields a complete map. Even so, their convergence supports the interpretation of Derryvree as a freshwater muskeg or tundra wetland, not a temperate woodland. The wetland itself was temporary on a geological scale, destined to be overridden and entombed as ice conditions changed again.

Animals of the Open Country

Animal bones from Irish caves show that the island supported, or was intermittently reached by, a far richer Ice Age fauna than survives today. Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork is the principal site. Its deposits have produced remains of woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. These animals evoke open grazing country and a food web that included large herbivores, carnivores and scavengers.

There are important limits. Castlepook is a cave repository accumulated through varied processes over a long span of time, and later water disturbance has mixed parts of the record. Individual bones have yielded dates ranging across much of the middle and later Ice Age; they do not demonstrate that every

named species lived together in one valley, let alone in 31,126 BCE. Improved radiocarbon pretreatment has also shown that several older determinations from Irish cave faunas needed revision. The strongest conclusion is deliberately modest: during Marine Isotope Stage 3, Ireland contained or received cold-adapted animals capable of exploiting open habitats, but their precise local ranges and contemporaneity remain uncertain.

Reindeer are especially relevant to the Derryvree-type landscape. They were mobile grazers well suited to open, seasonal country, while mammoths and giant deer required substantial forage. Their presence in the wider Irish record implies that parts of the island were biologically productive despite harsh climate. Spotted hyaena bones and coprolites from Castlepook also demonstrate that predators or scavengers entered this world. Caves may have been dens, traps, scavenging sites or places where water and sediment concentrated bones; they should not be treated as tidy snapshots of a living community.

The Human Question

There is no securely excavated settlement, hearth, dwelling, burial or stone-tool assemblage in Ireland that can be assigned to 31,126 BCE. Political affairs, diplomacy, institutions, named communities and warfare are therefore entirely beyond the evidence. There is no basis for describing an Irish people, chiefs, territories or alliances at this date. Nor can archaeology presently establish a regular population, a permanent occupation or a route by which people entered the island.

One find nevertheless makes the question impossible to dismiss. A reindeer femur from the old Castlepook collection has been reported as bearing a fresh-bone chop or cut mark consistent with processing by a sharp stone tool, and it has been associated in heritage interpretation with an age around 33,000 years ago. If that interpretation is sustained, it would indicate a human visit during the wider period and perhaps the butchery of a reindeer carcass. It would not prove a settlement, much less continuous habitation. The bone came from an early excavation rather than a modern, sealed archaeological context, and no associated toolkit has yet been recovered.

Accordingly, the most careful wording is that Ireland may have been visited by Upper Palaeolithic people during this broad interval. A brief hunting or scavenging episode is conceivable; enduring occupation is unproven. Any visitors would have depended on portable knowledge, fire, clothing, stone tools and social cooperation, as comparable Upper Palaeolithic groups did elsewhere in north-west Europe. Those are reasonable general comparisons, not discoveries made in Ireland. The Castlepook bone is significant precisely because it is so rare and because it asks a large question of a small piece of evidence.

No Politics, No Proven Ritual

Religion, language, art and learning cannot responsibly be reconstructed for Ireland in this period. No cave art, engraved object, musical instrument, burial rite or formal place of worship is securely associated with the Derryvree wetland or the possible Castlepook human horizon. It is tempting to supply Ice Age hunters with familiar stories of ritual, clan and territorial identity, but the Irish evidence does not permit it. The same restraint applies to economy and trade. There is no evidence for farming, herding, markets, metalworking or exchange networks on the island at this date.

If people did reach Ireland, their economy would have been based on the immediate use of wild resources: animal carcasses, fuel, water and perhaps seasonal plant foods. But that remains an inference from the environmental setting and wider European prehistory, not a documented Irish economy. The

more securely attested economy was ecological rather than human: plants fixing brief summer growth, herbivores converting it into meat and movement, and predators exploiting the herds.

An Island Approaching Ice

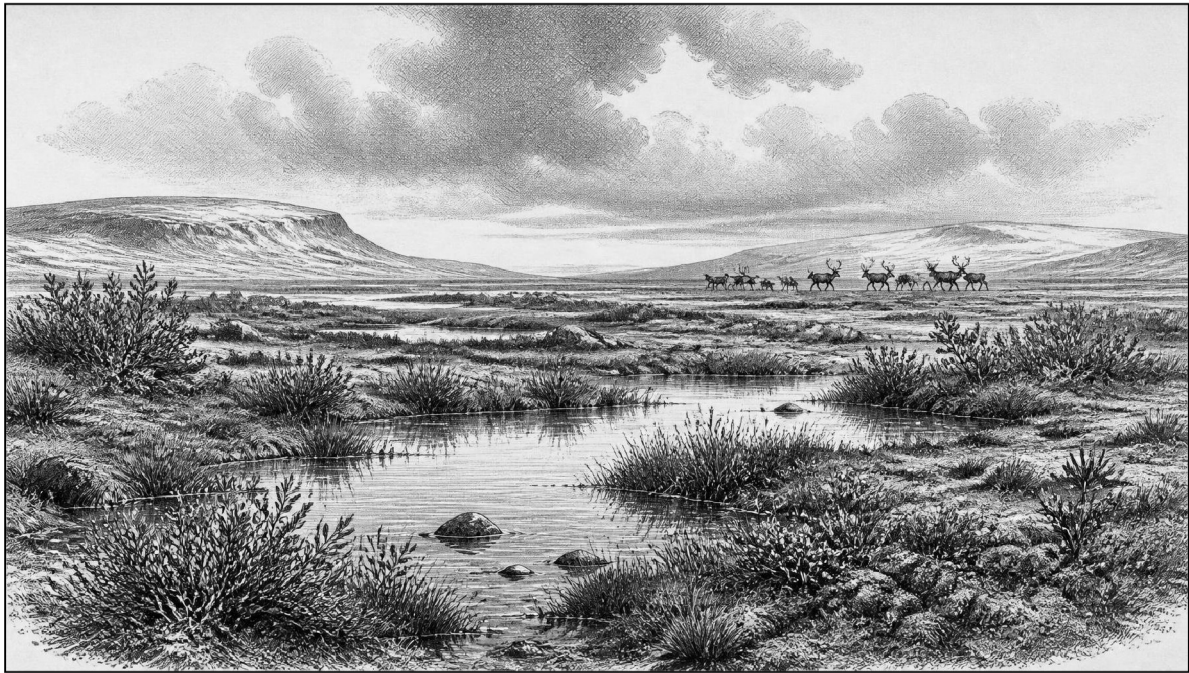
The long-term direction of change was towards greater glaciation. Modern reconstructions show that the last British–Irish Ice Sheet expanded in stages, with different sectors advancing at different times; its greatest volume came much later, around 23,000 years ago. At about 31,126 BCE, Ireland was therefore not at the Last Glacial Maximum but moving within the broader deterioration that preceded it. Conditions could alter sharply over millennia, and perhaps more rapidly in seasonal experience, reorganising wetlands, animal corridors and the reach of local ice.

Derryvree’s silts make this deep history tangible. They record water and plant life between two episodes of glacial occupation: a momentary ecological opening within an immense cycle of cold. That is the appropriate history of Ireland around 31,126 BCE. It is not the story of a recorded year, ruler or battle. It is a story of a frost-bound wetland in Fermanagh, open country in Cork, large animals moving through a vulnerable landscape, and the possibility—still not certainty—of an exceptionally early human encounter with it.

Chapter 076 of 100

31125 BCE

Cork Reindeer, Fermanagh Sedges^[76]



“31,125 BCE” is a modern chronological label, not a date at which an identifiable Irish event occurred. At this depth in time, calendar-year precision is unavailable. The label falls roughly 33,074 years before AD 1950, the conventional “present” of radiocarbon dating, but neither people nor environmental deposits in Ireland can responsibly be assigned to that individual year. The most useful comparison is with the later part of Marine Isotope Stage 3, a climatically unstable portion of the last glacial cycle, and with dated Irish evidence spanning broad intervals rather than single years.

For Ireland, this is not a history of kings, communities, named places or recorded migrations. It is a history reconstructed from buried freshwater sediment, pollen and plant fragments, insect remains, cave deposits, animal bone and changing ice. The evidence indicates that parts of the island could support tundra-like and wetland habitats before the Last Glacial Maximum. It does not permit a claim that Ireland was continuously inhabited, politically organised or even visited by people in precisely 31,125 BCE.

A Date Within a Range

The closest environmental evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 exposed a drumlin cut by a remarkable sequence: a lower glacial till, freshwater silts and fine sands containing organic material, and a second, upper till. This is an unusually clear local record of an interval in which ice had retreated or was absent long enough for water, sediment and vegetation to occupy the ground, before glacier ice again crossed the area and sealed the deposit.

Organic material from Derryvree produced the conventional radiocarbon determination BIRM-166, about 30,500 radiocarbon years before present, with a large error range. Such a measurement is not a calendar date. Radiocarbon ages must be calibrated against changing concentrations of atmospheric

carbon-14, and calibrations at this age remain broader and more model-dependent than those for recent millennia. Published discussions therefore place the Derryvree freshwater episode broadly in the Middle Midlandian cold-stage record, with calendar ranges extending across several thousand years. A range in the order of c. 36,900–31,700 calibrated years before present has been used for its wider context. The notional year 31,125 BCE can fall within that broad horizon, but it cannot identify the formation of a particular pool, leaf, insect or animal remain.

This distinction matters. Derryvree is not evidence for a village beneath a drumlin. It is evidence for an ice-free freshwater environment at some point between glacial advances. Its value lies precisely in its physical sequence: water and organic life accumulated on a landscape that was subsequently overridden, buried and preserved by ice.

Fermanagh's Cold Wetland

The Derryvree sediments preserve a severe, open environment rather than woodland. Plant evidence includes sedges, mosses, dwarf willow, bogbean, water-milfoil, mountain-avens and other cold-adapted or wetland taxa. Pollen, macrofossils and insect evidence from Derryvree and comparable northern sites indicate sparse vegetation with patches of marsh, shallow water and exposed mineral ground. This was not the dense green Ireland familiar today. Trees, if present at all locally, were not forming a closed forest; the landscape was shaped by cold, wind, frost and short growing seasons.

Such evidence supports careful inferences about everyday ecological conditions. Pools and saturated ground would have offered shelter, water and vegetation in a predominantly treeless terrain. Sedges and aquatic plants reveal that fresh water persisted seasonally or longer. Mosses and low shrubs imply sheltered microsites amid an otherwise raw landscape. They do not reveal human planting, stock-keeping or a managed economy. Agriculture, permanent field systems and domesticated animals lay tens of millennia in the future.

Other deposits in Northern Ireland, notably at Greenagho near Belcoo and at Aghnadarragh near Lough Neagh, reinforce the wider picture. They record phases of open, cold ground between episodes of ice advance. Together, they demonstrate that glaciation was neither a simple, uninterrupted white cover nor a single event. Ice margins, periglacial processes, lakes, wetlands and tundra vegetation shifted repeatedly. Regional conditions could differ sharply: a freshwater basin in Fermanagh tells us much about its locality, but should not be treated as a weather report for every part of Ireland.

Reindeer Country in Cork

Southern cave deposits add a different form of evidence. Castlepook Cave, near Doneraile in north County Cork, is Ireland's most important known archive of pre-Last Glacial Maximum vertebrates. Its complex chambers and deposits have yielded remains attributed to reindeer, woolly mammoth, giant deer, brown bear, wolf, red fox, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena. The species list evokes an open, cold landscape able to support large grazers and browsers, smaller Arctic-adapted mammals and powerful scavengers or predators.

The cave does not provide a single moment frozen in time. Bones may have entered through carnivore activity, natural deaths, water movement and changing cave entrances; historic excavation also disturbed contexts. Modern redating has shown that some older Irish cave determinations understated the antiquity of specimens, while different animals in the same cave may represent different episodes. The

responsible conclusion is that Ireland hosted, or was repeatedly reached by, a varied cold-stage fauna during Marine Isotope Stage 3. It is not safe to assemble every species into one simultaneous herd outside Castlepook in 31,125 BCE.

Spotted hyaena is especially significant. Its presence in Castlepook's fauna shows that Ice Age Ireland was not merely an Arctic desert. Hyenas occupied varied open habitats and could accumulate bones in caves, complicating any attempt to identify human activity from animal remains alone. Mammoth and giant deer similarly point to wider routes across north-west Europe and adequate forage over substantial areas, but their fossils do not establish a stable local population in every Irish region.

The Human Question

One Castlepook specimen has transformed discussion while also requiring restraint: a reindeer femur reported as bearing a deep mark interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone tool during carcass processing. Public heritage accounts place the bone at roughly 33,000 years ago, commonly rendered as around 31,000 BCE. If the mark is confirmed as anthropogenic and contemporary with the fresh bone, it would show that Upper Palaeolithic people handled a reindeer in Ireland far earlier than the previously secure evidence for post-glacial settlement.

That is a major possibility, not a licence to invent a Palaeolithic Irish population. No associated hearth, living floor, stone-tool assemblage, dwelling, human remains or cemetery has yet established a settlement at Castlepook for this period. A marked bone cannot tell us whether people hunted the animal, found a carcass, removed meat or hide, broke it for marrow, or made a brief stop before moving on. Nor does it reveal their language, kinship system, beliefs or relations with other groups.

If people did reach Ireland during this broad interval, the most defensible analogy is with mobile Upper Palaeolithic hunter-gatherers elsewhere in north-west Europe: small groups capable of using stone tools, exploiting animal and plant resources, making clothing and maintaining social connections across large territories. This is interpretation based on wider European evidence, not a direct description of a named Irish band. At present, Ireland offers a possible trace of human action, not proof of a durable society.

Routes, Seas and No Frontiers

There were no Irish states, borders, diplomacy or organised warfare that archaeology can identify. "Politics" in any meaningful sense is beyond the record. Nor is there evidence for trade into Ireland. Yet Ireland was part of a wider north-west European environmental system. Global sea level was much lower than today during the glacial cycle, but the Irish Sea region was also affected by changing ice masses and crustal movements. Lower sea level must not be simplified into a certain land bridge or an easy walk from Britain or continental Europe. Any human or animal movement depended on the changing combination of coastline, ice, river systems, weather and available habitat.

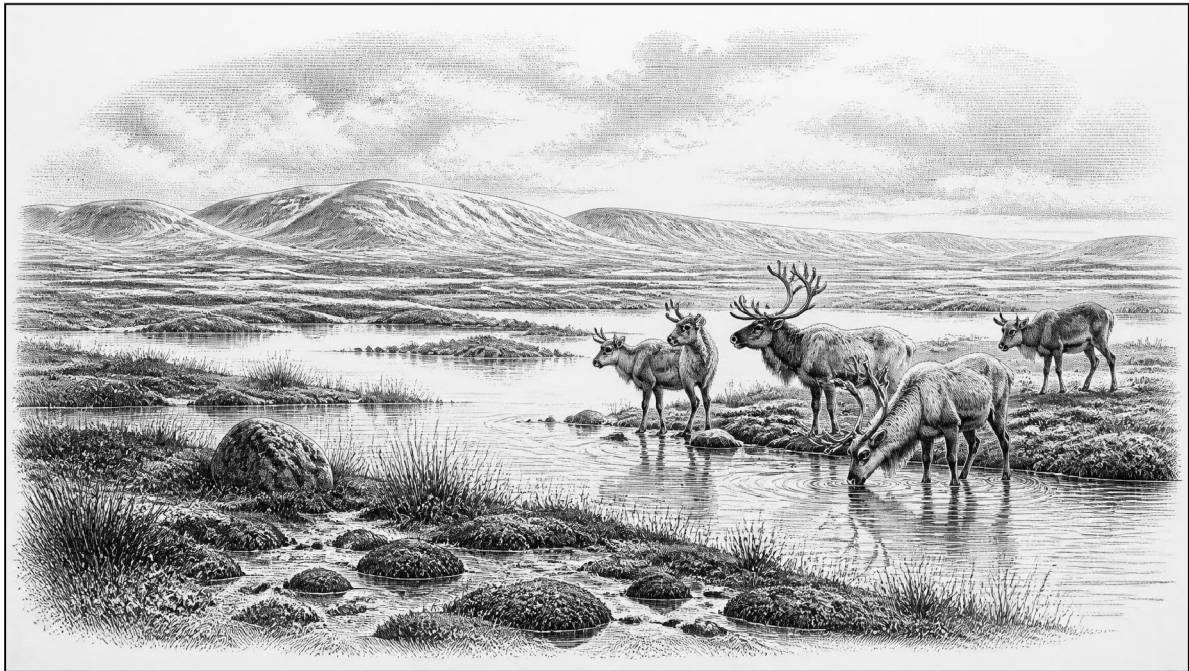
The greatest development relevant to this date was environmental rather than political: the approach of more extensive glaciation. The Last Glacial Maximum came later, broadly between about 26,000 and 19,000 years ago, when ice became far more extensive across Ireland and neighbouring regions. At the time represented by Derryvree and Castlepook, there were still ecological windows: cold wetlands in the north, open-animal landscapes in the south, and routes that could intermittently permit recolonisation. Those windows were fragile. Later ice would erode landscapes, rearrange sediments and greatly reduce the chance that traces of any early visitors survived.

Thus Ireland around the notional date of 31,125 BCE is best understood as a changing Ice Age landscape rather than an early nation. Fermanagh's buried freshwater sediments demonstrate local life between glacial episodes; Cork's caves preserve a striking, though time-mixed, fauna; and one reindeer bone raises the unresolved possibility of a human encounter. The evidence is powerful precisely because it is limited: it gives Ireland a deep Palaeolithic prospect, while insisting that the story remains one of ranges, environments and probabilities rather than an invented year-by-year event.

Chapter 077 of 100

31124 BCE

BIRM-166 Between Tills^[77]



The label 31,124 BCE is a modern chronological pin, not a date that people in Ireland could have named or recorded. There are no calendars, written sources, settlements, burials or securely dated activity surfaces that permit a history of one particular year. This point lies about 33,073 years before AD 1950, the conventional reference year for “before present” dating, in the Late Pleistocene’s Marine Isotope Stage 3. The responsible approach is therefore to examine evidence whose calibrated ranges overlap the date, while being clear that it records intervals of time rather than an anniversary.

A Date Within a Cold Phase

At this depth in time, radiocarbon ages cannot simply be converted into a single BCE number. Atmospheric radiocarbon varied substantially in the past; measurements must be calibrated against independently built curves and expressed as probability ranges. The key Irish deposit for this broad horizon, from Derryvree near Maguiresbridge in County Fermanagh, produced a conventional radiocarbon age of 30,500 +1,170/–1,030 radiocarbon years BP. Published calibrations place it broadly in the range of roughly 36,900–31,700 calibrated years BP, approximately 34,950–29,750 BCE. The modern label 31,124 BCE falls within that wide span, but cannot be attached to a particular layer, season or generation.

That distinction matters. Ireland was not a uniform land frozen in one fixed condition. Marine Isotope Stage 3 was climatically unsettled, with changes in temperature, snowfall, sea level, vegetation and ice extent over centuries and millennia. The Last Glacial Maximum, when the British–Irish Ice Sheet

achieved its broad greatest extent, lay later. Nor was ice advance and retreat simultaneous in every region. A cold wetland in Fermanagh, a limestone cave in Cork, high ground, the Irish Sea basin and the exposed continental shelf each preserve different portions of a changing story.

The Derryvree Freshwater Record

Derryvree is exceptionally important because it preserves a local landscape that later ice might otherwise have erased. Road works in 1969 cut through a drumlin and revealed freshwater silts and fine sands enclosed between two thick, distinct sheets of till: unsorted sediment deposited by glacier ice. The sequence demonstrates a simple relative order. Glacial ice had affected the locality; a non-glacial interval then allowed water, mineral sediment and organic matter to accumulate; subsequently, ice returned and buried the deposit beneath another till. It is evidence for local ice-free conditions between glacial episodes, not proof that all Ireland was ice-free.

Pollen, plant remains, mosses and small animal fossils make the deposit more than a geological curiosity. They indicate an open, treeless, wet environment often described as tundra or muskeg: shallow freshwater, moss-rich and sedgy ground, grasses, herbs, dwarf plants and limited dry terrain. Plants including bogbean, lesser clubmoss and Arctic-alpine associates show that even severe cold did not mean lifelessness. Summer thaw and standing or slow-moving water could sustain wetland communities; long winters and frost would have imposed powerful limits on growth and movement.

This was not the wooded Ireland of later millennia. The assemblage does not support nearby oak, hazel or ash woodland, agriculture, grazing fields or permanent villages. Isolated tree pollen grains in ancient sediment need careful treatment, since pollen can travel far or be reworked from older deposits. The stronger evidence is for sparse, open vegetation around freshwater. Derryvree therefore provides a valuable environmental reconstruction, but not a precise temperature reading or a map of every habitat on the island.

Cork's Cave Fauna

Caves in southern Ireland add a second, striking line of evidence. Castlepook Cave, also called Mammoth Cave, near Doneraile in County Cork has yielded remains attributed to reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. The National Museum of Ireland holds important material from the early twentieth-century excavations, including a spotted-hyaena skull. Together, these fossils establish that Ireland was intermittently part of a wider north-west European cold-stage animal world far richer in large mammals and predators than the modern island.

Yet the cave must not be treated as a census from 31,124 BCE. Its fossil-bearing deposits accumulated through more than one process: animals died, carnivores carried or disturbed bones, water moved sediment, and early excavators worked in contexts that were not recorded to modern standards. Re-dating using improved bone pretreatment and accelerator radiocarbon methods has shown that several older Irish cave dates were substantially too young. Castlepook remains are now understood to include fauna from Marine Isotope Stage 3, with some revised dates indicating a significantly older presence of species such as giant deer and spotted hyaena than formerly thought.

The safest conclusion is both substantial and limited. Reindeer and lemmings accord with open, cold habitats; mammoth, giant deer and horse elsewhere in southern cave records indicate large herbivores able to use productive grass-and-herb landscapes; hyaenas, wolves and foxes show that carnivores and

scavengers followed such prey. These species need not all have lived together, occupied the same district, or survived through the entire Derryvree interval. Fossils demonstrate repeated ecological connections and the availability of suitable habitat at times, rather than one complete Ice Age scene.

The Human Question

No securely excavated camp, hearth, stone-tool assemblage, dwelling, grave or human bone dates to this horizon in Ireland. A reindeer femur from Castlepook has been reported as bearing a mark consistent with fresh-bone cutting by a stone tool, and this has prompted the important possibility of very early human activity. If the mark proves to be anthropogenic and securely contemporary with the bone, it would suggest that people reached Ireland tens of millennia before the better evidenced Late Upper Palaeolithic and Mesolithic occupations.

For 31,124 BCE, however, it cannot responsibly be made to prove a settled population, a hunting camp or even a particular visit. The bone was not recovered with unequivocal tools, a hearth or an intact butchery floor, and Castlepook's historic excavation history complicates its context. Recent investigations have sought surviving deposits, refined dates and additional evidence precisely because the question is unresolved. The femur is best described as proposed evidence for a brief human presence, not as confirmation of continuous occupation.

No Politics, No Recorded Society

Accordingly, there is no evidential basis for political affairs, diplomacy, warfare, named communities, law or leadership in Ireland at this date. Nor can archaeology identify a religion, language, art tradition, teaching system or social rank. It would be misleading to project later Gaelic identities, Neolithic monuments or medieval county boundaries into this landscape. "Ireland" here means the landmass in its changing Late Pleistocene geography, not a state or people with a shared recorded identity.

Economy and everyday life are equally beyond direct recovery. There was no evidence of farming, herding, pottery, metalworking, trade networks or built settlement. If people occasionally entered the island, the available animal and environmental evidence makes mobile foraging a plausible general model, but it remains an inference drawn from comparable Upper Palaeolithic worlds elsewhere in Europe, not a demonstrated Irish way of life. Lower sea levels changed surrounding coasts and exposed shelf areas, but fossil evidence cannot yet reconstruct a dependable route, crossing or exchange corridor into Ireland.

An Archive of Change

The most meaningful development around this notional year was environmental rather than political: Ireland contained, at least in some regions and intervals, cold open ground and wetland habitats between episodes of glaciation. Derryvree's BIRM-166 sample and the fauna preserved at Castlepook give this deep past a tangible character—sedges and mosses around cold water, large herbivores on open country, and formidable carnivores in the wider landscape. They do not supply an event for 31,124 BCE. They show why precision must yield to process: fluctuating ice, shifting habitats, animal movement and the rare survival of evidence beneath the tills.

Chapter 078 of 100

31123 BCE

Juniper and Bogbean at Derryvree^[78]



Modern calendar-year precision is not available for Ireland in 31,123 BCE. No Irish community recorded a year, no political event can be attached to it, and no excavated occupation horizon is narrow enough to identify a particular season, family or journey. The date is best treated as a modern point within the Late Pleistocene: roughly 33,070 calendar years before AD 1950, during Marine Isotope Stage 3, a climatically unstable part of the last Ice Age. The evidence closest in age comes in calibrated ranges, and it illuminates environments rather than an annual chronicle.

The most valuable Irish record is the Derryvree freshwater deposit near Maguiresbridge in County Fermanagh. During roadworks in 1969, a cutting through a drumlin exposed organic silts and fine sands lying between two tills, the unsorted sediments left by glacier ice. The sequence provides a firm relative history: ice had occupied the locality; an ice-free interval then permitted a wetland or shallow-water environment to form; and a subsequent ice advance covered it. Organic material from the deposit produced the radiocarbon determination BIRM-166, conventionally dated to 30,500 $\pm$ 1,170/–1,030 radiocarbon years BP. Calibration places it broadly at about 36,900–31,700 calendar years BP, or approximately 34,950–29,750 BCE. The requested year falls within that wide span, but cannot be isolated within it.

A Date Within a Range

This distinction is more than a technical caution. Radiocarbon years are not calendar years: the amount of carbon-14 in the atmosphere has varied, and old measurements must be calibrated against independently dated records. At more than thirty millennia ago, both the original uncertainty and the

shape of the calibration curve make a single-year answer impossible. Derryvree may therefore be used to describe a cold Irish interval relevant to 31,123 BCE, but not to claim that a particular bogbean flower opened, a specific reindeer crossed Fermanagh, or people camped beside its water in that named year.

The wider setting was one of sharp climatic variation. Marine Isotope Stage 3 was neither a simple warm pause nor a single uninterrupted freeze. North Atlantic conditions shifted repeatedly between relatively milder interstadial episodes and colder stadials. Ireland's later glacial history has also been revised substantially as new offshore, terrestrial and cosmogenic dating has accumulated. What is secure is that the island was moving towards the far more extensive glaciation of the Last Glacial Maximum, when the British–Irish Ice Sheet covered almost all of Ireland and much of the surrounding continental shelf. Around this earlier date, ice extent and the survival of ice-free terrain varied by region and through time.

Wet Ground Between Glaciers

Derryvree is important precisely because it contradicts any picture of an Ireland sealed continuously beneath ice throughout the Late Pleistocene. The organic bed preserves a local freshwater landscape within a periglacial climate: ground shaped by severe cold and seasonal freezing rather than necessarily by ice lying directly overhead. Pollen was poorly preserved, but plant macrofossils, mosses and insect remains supplied a more tangible record. They point to open, largely treeless vegetation, with wet hollows, pools and sedge-rich ground amid sparse tundra-like cover.

Among the plants identified or inferred from the deposit are sedges and other herbs, mosses, bogbean, water-milfoil, dwarf willow, juniper and cold-adapted taxa such as mountain-avens and alpine clubmoss. Their significance lies in combination, not in the presence of any one species. They suggest a mosaic of shallow freshwater, saturated ground and exposed mineral surfaces, rather than forest or a uniformly barren polar desert. Juniper and willow indicate that at least sheltered patches could sustain low woody growth; the wider assemblage nevertheless speaks of a landscape open to wind, frost and short growing seasons.

Such evidence supplies the nearest available picture of everyday ecological conditions. Meltwater and groundwater could gather in depressions, while frost action, snow cover and seasonal thaw repeatedly altered the margins. Small insects and mosses are especially useful witnesses because their survival depends on precise combinations of moisture, temperature and vegetation. They show that cold country was still biologically active. Yet Derryvree was a single basin in south Fermanagh, not a survey of the whole island. Its record cannot by itself establish the weather, vegetation or ice cover of Cork, Connacht or the Irish Sea coast at the same moment.

Animals and the Cork Caves

For the larger animals of Ice Age Ireland, Castlepook Cave near Doneraile in north County Cork is the crucial counterpart to Derryvree. Excavations and later study of museum collections have produced remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. It is Ireland's richest known cave archive for Pleistocene vertebrates. These finds demonstrate that, during parts of the Late Pleistocene before the glacial maximum, the island could support a striking cold-climate fauna.

The cave collection must not, however, be read as a photograph of one living community. Caves accumulate material over long periods. Carnivores can drag carcass parts into them; water can move bones; earlier excavations may disturb layers; and later ice and sedimentary processes can remove or mix context. Spotted hyaena remains and damage on bones are particularly important reminders that Castlepook could function as a carnivore den or refuge. A mammoth bone or reindeer limb inside a cave does not prove that the animal died there, still less that every species represented occupied Cork together.

Nor can the Castlepook fauna be assigned neatly to 31,123 BCE. Individual dates from the cave and its historical collections fall across a broad pre-Last-Glacial-Maximum interval, while improved pretreatment and redating have shown why older bone chronologies require care. The responsible conclusion is modest but significant: Ireland was not ecologically empty in this part of the last Ice Age. At intervals, routes across the then-lower surrounding seas and exposed shelf landscapes permitted animals to reach the island, while changing climates and advancing ice repeatedly narrowed or erased habitats.

The Human Question

The most provocative item from Castlepook is a reindeer femur reported to bear a deep mark interpreted as having been made by a sharp stone tool during butchery. The bone has been presented as dating to around 33,000 years ago, making it broadly relevant to the period considered here. If the interpretation of the modification as anthropogenic is sustained, it would be Ireland's earliest known indication of human activity, far earlier than the better documented terminal-Pleistocene and Mesolithic evidence.

Its importance should not turn one bone into a settled history. A mark on an animal bone is evidence for an action, not automatically for a dwelling, a resident population, a hunting territory or a named cultural group. No securely associated stone-tool assemblage, hearth, shelter floor, burial, ornament or art is presently known from Ireland for this date. Nor can the cave itself be assumed to have been a human home: its carnivore history makes that inference especially unsafe. The best formulation is that Castlepook offers a tantalising, contested and potentially transformative trace of Upper Palaeolithic human presence or visitation.

Should people have reached Ireland during such an interval, they would have been mobile hunter-gatherers operating within a wider north-west European world, not farmers or inhabitants of later-style villages. Their economy would have depended on gathering and hunting, perhaps including the processing of large herbivores, but direct Irish evidence does not permit reconstruction of their diet, social organisation, language, clothing or seasonal routes. The possibility of a human visit does not prove regular migration, trade or permanent settlement. Indeed, the scarcity of secure evidence may reflect both a small human footprint and the destructive power of later glaciers, which scoured landscapes and buried or removed older deposits.

No Politics, No Proven Diplomacy

There is no evidence for political affairs, warfare, diplomacy, chiefs, territories or institutions in Ireland at this date. Those categories require durable traces of human communities and, normally, much denser archaeological evidence than survives. Nor is there responsible evidence for formal religion, ritual practice, learning or artistic traditions on the island in 31,123 BCE. Continental Europe contains rich

Upper Palaeolithic evidence for symbolic life, but it cannot simply be projected across the sea onto Ireland. The absence of Irish evidence is not proof that thought, belief or custom were absent from every possible visitor; it is a limit on what can be claimed.

Trade is similarly beyond demonstration. Sea level was substantially lower than today because vast volumes of water were stored in ice sheets, so coastlines and routes were different. But a lower sea does not mean that Ireland was automatically joined to Britain or the Continent by a dry land bridge at this particular time. The changing Irish Sea basin, ice margins, channels and exposed shelves formed a complex physical geography. Animal dispersal proves that some crossings were possible over longer intervals; it does not reveal a human exchange network or regular traffic.

An Island Approaching Transformation

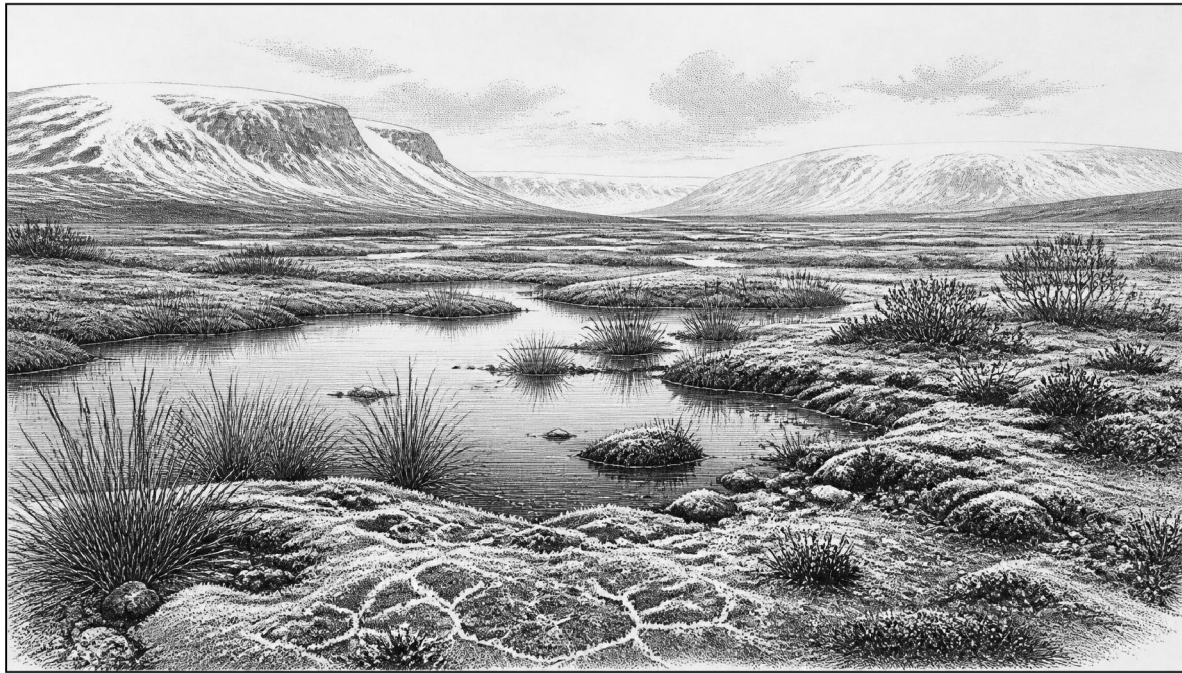
What matters most about Ireland around 31,123 BCE is therefore environmental change. Derryvree records a locally ice-free wetland after an earlier glacial phase. Castlepook preserves the time-averaged remains of animals adapted to cold, open landscapes and of predators that could exploit them. Together they reveal an Ireland of tundra vegetation, freshwater hollows, mobile fauna and unstable climatic boundaries. They also show why the record is fragmentary: later advances of the British–Irish Ice Sheet transformed the ground, covered older surfaces and reduced the chance that campsites or bones would survive.

This is not a year of kings, battles or monuments. It is a narrow modern label placed within a much broader interval of ecological possibility and geological upheaval. The evidence supports a picture of a cold, partly habitable and changing Irish landscape, and perhaps the briefest human touch upon a reindeer carcass. It does not support an annual narrative. In deep prehistory, the most honest history is sometimes a map of limits: what sediments establish, what bones suggest, and what must remain unknown.

Chapter 079 of 100

31122 BCE

BIRM-166's Tundra Silt^[79]



31,122 BCE is not a date to which Irish prehistory can be fixed in the ordinary calendar sense. No written record, settlement layer or event can be assigned to this particular year. It is best treated as an approximate point within the Late Pleistocene, during the long cold phase conventionally termed the Late Midlandian in Ireland and the Late Devensian in Britain. At this depth of time, radiocarbon determinations, their calibration ranges, cave deposits and glacial sediments provide ranges rather than anniversaries. The evidence illuminates landscapes and ecological changes, not a dated political history.

The closest especially informative Irish evidence is the freshwater deposit found beneath a drumlin at Derryvree, near Maguiresbridge in County Fermanagh. During road works in 1969, researchers recorded organic silts and fine sands sealed between two substantial sheets of glacial till. One measurement from this sequence, BIRM-166, produced an uncalibrated radiocarbon age of 30,500 years BP, with a sizeable error range of +1,170/–1,030 years. Calibration moves such an age further back in calendar time and broadens its uncertainty. It is therefore responsible to place the Derryvree wetland in a wider late-Marine Isotope Stage 3 to early-Marine Isotope Stage 2 interval, rather than declare that it represents conditions in 31,122 BCE precisely.

A Landscape on the Edge of Ice

The numbered year falls close to a major climatic transition. Reconstructions of the British–Irish Ice Sheet show that ice was building rapidly around 31,000 years ago, though its extent varied markedly by region and is not known with equal confidence everywhere. Upland ice centres existed in northern and

western Ireland, while glaciers and ice fields occupied several mountain regions. The largest expansion of the ice sheet was still developing; its maximum extent in different sectors occurred at different times, broadly between about 30,000 and 22,000 years ago.

That distinction matters. Ireland was neither uniformly buried beneath ice nor a single open plain. It contained shifting combinations of ice-covered uplands, cold lowlands, meltwater corridors, exposed rock, gravelly ground and wetlands. Derryvree's organic layer survived because sediment accumulated in freshwater conditions before later ice or ice-related deposits sealed it beneath the drumlin. Such local archives are exceptionally valuable, but they are not a nationwide weather report. They tell us what could persist in one Fermanagh basin during a cold interval, not what every Irish valley looked like at the same moment.

The Derryvree evidence nevertheless gives substance to the phrase 'Ice Age Ireland'. The deposit contained a flora and fauna described by its excavators as having a full-glacial character, indicating open tundra vegetation and a periglacial climate. Periglacial did not mean permanently ice-covered: it denotes ground and ecosystems shaped by severe cold, repeated freezing and thawing, sparse plant cover and short growing seasons in the vicinity of glaciers or ice sheets. The likely scene was not a forest. It was a low, exposed mosaic of wet ground, shallow water, sedges, mosses, dwarf shrubs and scattered herbs, with seasonal snow and frost exerting more influence than trees.

The Freshwater Archive at Derryvree

Plants are among the strongest witnesses for this period because spores, pollen, seeds and other small remains can survive where wood, skin and entire landscapes do not. The Derryvree material includes indicators of cold open ground and wetland habitats. Fossil records from the deposit have been noted for lesser clubmoss, a plant of open, often upland or wet places, and bogbean, whose seed signals standing or slow-moving fresh water. These finds support an interpretation of pools and marshy margins amid tundra-like vegetation. They do not establish a particular temperature for 31,122 BCE, but they do rule out a densely wooded Irish countryside.

Water was central to the landscape. Fine silts settle in quiet conditions, so the Derryvree sequence points to a freshwater basin that endured long enough to accumulate organic mud. Around it, frost action would have disturbed soil, while meltwater and seasonal runoff carried mineral sediment into hollows. In a world where the coastline lay far from its modern position because sea level was lower, inland drainage and ice margins were also changing. The Ireland of this period cannot be plotted safely on a modern road map: later ice erosion, deposition, peat growth, river change and rising seas have remade its surfaces and shores.

Other Irish localities demonstrate why caution is necessary. Aghnadarragh in County Antrim has yielded organic and stratified deposits between glacial tills, while cave sites in the south preserve animal remains of differing ages. Together they show that apparently barren terrain could contain episodes of open ground, freshwater sedimentation and animal movement. They do not prove that such episodes were continuous, simultaneous or identical across the island. The broad pattern is regional instability: cold habitats existed, but advancing ice repeatedly threatened to erase them.

Animals, Caves and a Fragile Human Question

Southern Irish caves provide a second, very different archive. Castlepook Cave near Doneraile in County Cork has produced remains of reindeer, mammoth, horse, bear, wolf and other Pleistocene animals, as well as evidence for spotted hyaena. These species should not be imagined as a single, permanent community living together in one valley. Cave assemblages can be mixed by carnivores, water, collapse, excavation and later disturbance; individual bones may belong to different millennia. Even so, direct re-dating has established that parts of the Castlepook fauna are substantially older than earlier measurements suggested, confirming that Ireland supported a richer cold-stage mammal fauna during Marine Isotope Stage 3.

Reindeer are the animal most directly relevant to a tundra landscape. Their presence indicates that suitable open habitats and routes into Ireland existed at least intermittently. Mammoth and horse remains suggest broad grazing country, while hyaena bones and gnawing evidence remind us that caves were sometimes dens or scavenging places rather than shelters for people. A cave bone is consequently evidence first for an animal, and only sometimes for the circumstance in which it died or was brought underground.

One Castlepook reindeer femur has attracted particular attention because a mark on it has been interpreted as damage made by a sharp stone tool during butchery. Public heritage accounts have associated the specimen with roughly 31,000 BCE. It is an important possibility, not a secure yearly event. The bone's age, the identification of the mark, and the presence of a person are three separate propositions. No securely associated stone-tool assemblage, hearth, dwelling, burial or occupation surface of comparable age has yet been found in Ireland. The original cave excavations also disturbed deposits, limiting what can now be reconstructed from provenance alone.

If the mark ultimately withstands further microscopic and contextual study, it would suggest a brief encounter between people and a reindeer carcass during a cold-stage interval. It would not demonstrate a settled community, a named group or continuous occupation of Ireland. Mobile Upper Palaeolithic hunters elsewhere in north-west Europe had sophisticated stone technologies, extensive knowledge of animal behaviour and social connections across wide territories. Those are useful comparisons, but they are not direct evidence that a similar camp, language, ritual or social organisation existed in Ireland at this exact time.

No Politics, No Recorded Conflict

Political affairs, diplomacy and formal warfare are beyond the reach of the Irish evidence for this date. There were no states, kingdoms, borders, inscriptions or historical persons to identify. Nor can archaeology responsibly turn the presence of predators or a possible butchered bone into a story of conflict between human groups. If people did visit, their survival would have depended on small-scale decisions: finding sheltered ground, reading weather and ice, locating animals, maintaining tools and sharing food. These are inferences from human ecology, not recorded facts about a known Irish population.

The same restraint applies to religion, culture and learning. Nothing from Ireland around this time demonstrates shrines, burials, art, ceremony or a distinct local tradition. Caves can acquire powerful meanings in later societies, but their Pleistocene animal deposits do not by themselves show ritual. The most defensible cultural conclusion is negative but significant: Ireland has not yielded an unequivocal human material culture securely dated to this interval. Its archaeological silence is partly genuine and

partly the consequence of preservation. Later glaciers scoured and buried land surfaces; the rising post-glacial sea drowned former coastal plains; and many early cave collections were excavated before modern recording standards.

Economy Without Settlement

There is no evidence for farming, herding, villages, trade networks or permanent settlement in Ireland at 31,122 BCE. A possible human visit would belong to a foraging economy, based on wild animals and gathered resources, but even that must remain conditional until a securely excavated Palaeolithic site is found. Reindeer would have offered meat, fat, hide, sinew, bone and antler; yet the inference that people used these materials in Ireland cannot be made from animal presence alone. Carnivores and natural processes could produce much of the surviving bone record.

The more certain history is environmental. Northern Fermanagh preserves the sediment of a cold freshwater wetland, while Cork caves preserve fragments of a wider Pleistocene fauna. At the scale of the island, ice was accumulating and landscapes were becoming increasingly vulnerable to burial beneath till. This was a threshold period rather than a foundation moment. The later Last Glacial Maximum would obscure much of what came before it, leaving historians dependent on rare sealed silts, isolated bones and scientific methods capable of revising old conclusions.

Thus Ireland around 31,122 BCE is best understood not as a year of documented human action but as an interval of tundra, freshwater basins, mobile animals and growing ice. BIRM-166, sealed under a Fermanagh drumlin, is especially eloquent because it preserves a brief ecological world otherwise lost. Its lesson is both vivid and modest: before the island's later glacial cover reached its greatest power, some Irish lowlands could still hold open cold-country wetlands and the life adapted to them.

Chapter 080 of 100

31121 BCE

Derryvree's Freshwater Archive^[80]



“31,121 BCE” is a modern label, not a year that anyone in Ireland could have named or recorded. There was no calendar, writing, ruler, settlement chronicle or event list from which to construct an annual history. In archaeological terms, this point lies roughly 33,070 years before AD 1950, the conventional reference point for “before present” dating, during the Late Pleistocene and Marine Isotope Stage 3. Calendar precision at this depth is unattainable: radiocarbon results require calibration and commonly produce ranges of centuries or millennia. The responsible history of Ireland at this date is therefore an account of landscapes, deposits, animals and a small but important question about human presence.

A Date Within a Long Interval

The most illuminating evidence comes not from a site securely dated to this numbered year, but from Derryvree near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed an exceptional sequence: glacial till beneath, freshwater silts and organic sediments in the middle, and a further till above. This arrangement matters because it records an interval when the locality was free of overriding ice between episodes of glaciation. A radiocarbon determination from the organic layer, BIRM-166, gave $30,500 \pm 1,100$ radiocarbon years BP. When calibrated, this has been treated broadly as falling about 36,900–31,700 calendar years BP. The modern date 31,121 BCE sits near the younger end of that wide interval, not at a detectable moment within it.

The Derryvree deposit does not provide a snapshot of a single season. Sediment accumulated over time; plant remains, pollen and insects came from the surrounding catchment; later ice sealed the layer beneath till. Yet precisely because it was sealed, it preserves rare evidence of an Irish landscape that later

glaciation largely erased. It shows that at least part of north-central Ireland could support open ground, standing and slow-moving freshwater, mossy vegetation and animal life during a cold phase long before the fullest expansion of the last British–Irish Ice Sheet.

Cold Water, Open Ground

The environmental evidence points to a treeless, periglacial wetland rather than a forested island or a featureless sheet of snow. Derryvree’s plant macrofossils include mosses and cold-adapted wetland and tundra plants, among them sedges, bogbean (*Menyanthes trifoliata*), dwarf willow and mountain-avens. Pollen was poorly preserved, but the record is dominated by herbs and grasses rather than trees. Insects add another layer of evidence: their ecological requirements indicate wet ground rich in decaying plant matter, open pools and mossy margins. Together, these lines of evidence support the interpretation of a muskeg-like mosaic of shallow water, saturated sediment, low vegetation and sparsely vegetated drier patches.

Such a place would have been intensely seasonal. Winters were severe, with frost action shaping exposed ground; summers were short but capable of sustaining sedges, herbs, mosses and aquatic plants. The word “tundra” is useful only if it does not conjure an unchanging polar desert. Derryvree suggests variety at a local scale: pools, wet hollows, plant-rich margins and open dry surfaces. The exact temperature, snow cover and length of the growing season cannot be read directly from one buried bed. They are reconstructed from fossil species and sedimentary context, and should remain interpretations rather than treated as observed weather.

An Island Before Maximum Ice

Ireland’s position at about 33,000 calendar years ago was unstable. The last ice sheet had not yet reached its best-established island-wide maximum, which came substantially later, broadly during the period around 26,000–21,000 years ago, although different sectors advanced and retreated at different times. Modern reconstructions of the British–Irish Ice Sheet emphasise this unevenness. It would be misleading to say simply that Ireland was either wholly frozen or wholly ice-free in 31,121 BCE. Regional conditions differed, and the resolution of available dates cannot map an ice edge for one calendar year.

Derryvree demonstrates local ice-free conditions in Fermanagh during its dated interval. It does not prove that every Irish valley, upland and coast was simultaneously open, nor does it identify a continuous route across the island. Conversely, later ice did not obliterate every trace of the earlier landscape: the freshwater bed survived precisely because it lay between glacial deposits. Ireland’s modern drumlins, tills, lake basins and river courses were profoundly shaped by repeated glacial episodes, but the landform visible today is not a simple map of conditions at this remote date.

Castlepook’s Animal Record

County Cork offers a different kind of evidence. Castlepook Cave, near Doneraile, has produced one of Ireland’s richest Late Pleistocene faunal collections. Its long sequence includes remains of woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Several specimens have radiocarbon ages placing them in Marine Isotope Stage 3, including around 34,000–

35,000 radiocarbon years BP for some mammoth, hyaena and reindeer remains. Those determinations are not equivalent to the modern BCE label in this article: a radiocarbon age must be calibrated, and the cave accumulated material over a long period.

Nevertheless, Castlepook establishes an essential point. In suitable pre-maximum glacial phases, southern Ireland formed part of a wider north-west European world inhabited by large grazing animals and their predators. Reindeer imply extensive open country; mammoth and giant deer indicate substantial herbivore resources; hyaenas, wolves and bears point to a functioning carnivore guild. Caves were not necessarily domestic shelters. Carnivores could drag remains inside, animals could die in natural traps, water could move bones, and early excavations did not record contexts to modern standards. Castlepook is best understood as a time-averaged faunal archive, not as a single living landscape frozen in time.

The Human Question

A reindeer femur from Castlepook has made this broad period especially significant. The bone has been publicly reported as approximately 33,000 years old and bears a deep mark interpreted by zooarchaeologist Ruth Carden as damage from a sharp stone tool during carcass processing. If that diagnosis and chronology are confirmed through full specialist study, it would indicate human handling of a reindeer in Ireland during the Upper Palaeolithic, far earlier than the island's long-established post-glacial settlement record.

The limits of the evidence are as important as its promise. A bone dates the death of an animal within a range; it does not date an individual person, camp or journey to a calendar year. Nor does a single incision automatically establish butchery, since bone can be altered by carnivore teeth, trampling, sediment abrasion, breakage and excavation damage. Castlepook's deposits were disturbed by animal activity, water movement and early twentieth-century digging. No securely associated hearth, stone-tool assemblage, dwelling floor, burial, art panel or repeated occupation surface of this age has yet been published from Ireland. The reindeer bone may signal a brief visit or hunting episode; it cannot demonstrate a settled population, a named people or continuity with later inhabitants.

Society Beyond the Evidence

For that reason, conventional headings such as politics, diplomacy and war have almost no direct content here. There is no evidence for Irish kingdoms, chiefs, territorial boundaries, treaties, organised conflict or institutions. Equally, there is no Irish evidence from this date for farming, herding, pottery, metalwork, monuments, formal trade, writing, religion or art. These absences are not proof that no social relationships existed among any people who may have entered the island; they are limits imposed by the surviving record.

If people did visit, their everyday life would have depended on mobility, weather, animal behaviour and access to stone, fuel and shelter. Across north-west Europe, Upper Palaeolithic groups used sophisticated stone technologies and exploited large game, but that continental context must not be converted into unproven Irish detail. No particular tool tradition can responsibly be assigned to Castlepook, and there is no basis for imagining a permanent camp beside Derryvree's pools. Exchange or movement across the exposed continental shelves and through Britain is plausible in broad geographical terms, but no Irish artefact or imported material demonstrates a trade network at this point.

What This Year Can Mean

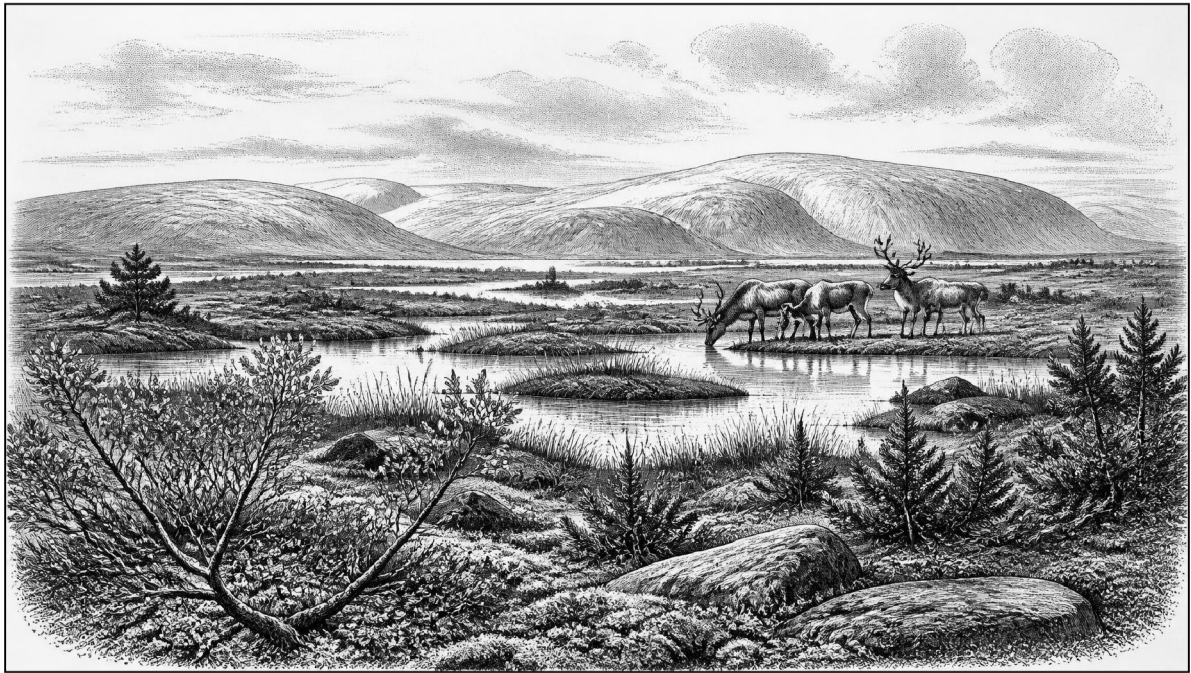
The most important development represented by 31,121 BCE is not a dated human event but the survival of evidence from a vulnerable interval before renewed, more extensive glaciation. Derryvree records freshwater life in a cold, open Fermanagh landscape. Castlepook records an ecologically diverse Ice Age fauna in Cork and preserves a provocative, still limited clue to possible human activity. Together they replace the old image of an eternally ice-covered, lifeless Ireland with a more exacting one: a region of shifting ice margins, wetlands, open grazing country, caves, predators and intermittent opportunities for movement.

That history is necessarily cautious. We can describe a broad environmental world with confidence because sediments, fossils and stratigraphy support it. We can say that human presence is a serious possibility because of the marked reindeer bone. We cannot name its people, narrate their beliefs, assign them a language or make 31,121 BCE the date of an arrival. At this depth of time, the most truthful year-by-year history is one that preserves the distinction between what the Irish ground contains and the stories later observers might wish it to tell.

Chapter 081 of 100

31120 BCE

Derryvree's Aquatic Refuge^[81]



The label 31,120 BCE cannot identify an eventful year in Irish history. It is a modern backward count, roughly 33,070 years before the conventional radiocarbon reference year of AD 1950, not a date that any person living then could have reckoned. No Irish evidence can be resolved to a named year, season, generation or political episode at this depth of time. The responsible historical frame is therefore a broad Late Pleistocene horizon: an unstable part of the last Ice Age, within Marine Isotope Stage 3, when climatic shifts, shifting ice margins and sparse preservation govern what can be known.

The nearest significant Irish environmental record is not a settlement but a buried freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh. It offers a rare view of a landscape that existed between phases of glaciation. Its evidence is powerful precisely because it is material and stratified: sediments, pollen, plant macrofossils and insect remains. But it remains a local archive. It cannot furnish a weather report for every part of Ireland, still less a narrative for one modern calendar year.

Calendar Labels and Deep Time

Modern calendar precision must not be imposed upon this period. The organic Derryvree deposit produced the radiocarbon determination BIRM-166, conventionally dated to about 30,500 radiocarbon years before present, with a substantial published uncertainty. Calibration, which translates radiocarbon ages against changing past atmospheric carbon levels, places the deposit broadly within about 36,900–31,700 calibrated years before present. The date 31,120 BCE falls within that wide range, but it was not the date of a particular pool, animal, human visit or climatic turn.

This distinction matters. A radiocarbon measurement dates the death of sampled organic material, subject to laboratory uncertainty and calibration; it does not date every grain of sediment, nor the entirety of a landscape. The deposits were also exposed in a road cutting through a drumlin, then interpreted through modern geological and palaeoecological methods. Their sequence nevertheless establishes a durable relative history: till from glacial activity below, freshwater organic sediments in the middle, and later till above. At Derryvree, therefore, ice had retreated or was absent long enough for a wetland ecosystem to form before renewed glaciation sealed it beneath another deposit.

A Wetland Between Ice Advances

Derryvree was neither modern green Ireland nor a featureless snow desert. The combined botanical and insect evidence points to open, treeless tundra or muskeg: wet, plant-rich ground with shallow pools and mossy margins in a periglacial climate. Grasses, sedges, herbs and juniper were important components of the surrounding vegetation. Fossils also include plants associated with cold, open ground and freshwater edges, among them mountain-avens, dwarf willow, bogbean and alternate water-milfoil. The latter two are especially useful reminders that even a severe cold-stage landscape could contain standing or slow-moving freshwater.

That evidence supports an image of local ecological variety rather than uniform barrenness. Mosses and sedges grew where waterlogged soil allowed them to do so; low shrubs and herbs occupied better-drained ground; open water sustained aquatic plants. Insect assemblages reinforce the interpretation of cold wetland conditions with pools and substantial vegetable matter. Yet interpretation should stop there. The fossils do not reveal the exact extent of the marsh, the height of snow in a particular winter, or whether a plant population persisted continuously for centuries. They demonstrate habitats represented in, or very near, the sediment source.

The broader context was one of climatic deterioration before the Last Glacial Maximum. The British–Irish Ice Sheet did not reach its maximum extent until much later, broadly around 25,000–23,000 years before present in many reconstructions, though its growth and local margins were complex. At approximately 33,000 years ago, Ireland’s terrain was already shaped by cold climates and earlier ice, while conditions and ice cover varied strongly from place to place and through time. Derryvree’s intervening organic bed is important evidence against treating the whole island as continuously ice-covered throughout the period.

Animals in the Irish Landscape

County Fermanagh supplies the clearest environmental evidence close to this notional date, while north County Cork supplies the most evocative faunal archive. Castlepook Cave, near Doneraile, has produced more than two thousand Pleistocene bones and is Ireland’s richest known cave record for the period leading towards the Last Glacial Maximum. Direct dates from individual bones extend across a long span, approximately 45,700 to 19,950 radiocarbon years before present. This is not one animal community preserved in a single instant. It is an accumulated and disturbed cave archive spanning many millennia.

Its fauna nevertheless shows that Ireland could support, or at least receive, a remarkable range of large and small mammals during different parts of the late Ice Age: woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Several Castlepook specimens fall broadly near the time horizon represented by 31,120 BCE, including bones of mammoth, reindeer, giant deer and

bear. Such finds establish that these animals reached Ireland at various times in Marine Isotope Stage 3; they do not prove that all species grazed the same valley together, or that each ranged across the entire island.

Spotted hyaenas are particularly revealing, both ecologically and archaeologically. Their presence indicates a carnivore able to transport, gnaw and accumulate bones in caves. Water movement, slope wash, natural animal deaths and early excavation practices further altered the deposits. A bone in Castlepook Cave may therefore record a kill elsewhere, scavenging, denning, transport into the cave, or later redeposition. Cave faunas are vital evidence, but not straightforward inventories of a living landscape.

The Human Question

There is no securely excavated settlement, hearth, dwelling, burial, stone-tool assemblage or human skeleton in Ireland dated to around 31,120 BCE. There is consequently no basis for identifying a population, language, kin group, territory or continuous occupation. Political affairs, diplomacy, institutions and warfare belong to categories for which this period offers no Irish evidence. Nor can religious practice, learning, art, social rank or ritual be responsibly reconstructed from the available record.

The strongest reason not to dismiss human possibility altogether is a reindeer femur from Castlepook Cave, reported as dating to roughly 33,000 years ago and bearing a mark interpreted as a sharp stone-tool cut made while the bone was fresh. If that interpretation is upheld, it would indicate the butchery of a reindeer by people in Ireland long before the better-known terminal Pleistocene evidence. It would still be evidence for an action, not proof of a settlement. The cave's old and disturbed collections lack the securely associated tools, hearths and intact occupation surface needed to turn one modified bone into a detailed social history.

A cautious interpretation is that brief human incursions were possible during favourable intervals, perhaps by mobile Upper Palaeolithic hunter-gatherers familiar with cold open environments elsewhere in north-west Europe. This is an inference, not a demonstrated Irish community. It remains uncertain how people or animals reached the island. Lower sea levels altered coastlines, but routes between Ireland, Britain and continental Europe were shaped by ice, sea, local topography and changing relative sea level; a simple, permanent land bridge should not be assumed. No evidence presently identifies a travel corridor used at this particular time.

Subsistence Without an Economy

If people did visit, reindeer would have offered meat, fat, hide, sinew and bone, and large herbivores may have drawn hunters into open country. But this is a statement of potential resource use, not evidence for a settled economy. No Irish assemblage of this age documents repeated hunting camps, food storage, exchange networks, tool manufacture or seasonal rounds. There is no basis for describing trade, farming, herding, maritime life or ownership of land. Agriculture lay tens of millennia in the future.

The most reliable 'economy' visible in the evidence is ecological. Wetlands accumulated organic matter; plants occupied niches determined by moisture and cold; herbivores fed in open landscapes; predators and scavengers moved carcass parts; water and sediment redistributed remains. The later advance of glacier ice then transformed preservation itself, covering and eroding many earlier surfaces

while sealing a few exceptional deposits. Ireland's apparent scarcity of sites may reflect genuinely intermittent human presence, but also the destructive force of later glaciation and the limited survival of Pleistocene landscapes.

What This Date Can Mean

For Ireland around this notional date, the central development was environmental precariousness. Derryvree records an ice-free freshwater refuge in a cold, treeless world, while Castlepook records animals that negotiated an island landscape before the great expansion of the last ice sheet. Together they show that Late Pleistocene Ireland was neither timelessly frozen nor continuously inhabited: it was a changing mosaic of wetland, open ground, caves, animals and advancing ice.

That is a more compelling history than an invented event for 31,120 BCE. The evidence preserves a world in which a bogbean seed, a dwarf-willow fragment, a beetle, a mammoth bone or a disputed cut on reindeer bone can carry historical weight. It also imposes discipline. The archive can illuminate climate, habitat and faunal presence; it can suggest, but not yet demonstrate, fleeting human activity. Everything beyond that must remain openly uncertain.

Chapter 082 of 100

31119 BCE

BIRM-166's Sedge Basin^[82]



The label 31,119 BCE is a modern way of pointing to a remote point in the Late Pleistocene, not a year from which Ireland preserves an event-by-event history. It equates roughly to 33,068 years before AD 1950, the conventional “present” used in radiocarbon work. That arithmetic is useful for orientation, but it must not be mistaken for calendar precision. No Irish settlement surface, hearth, burial, ruler, battle or treaty can be assigned to this particular year. The responsible account is instead one of climatic change, glacial movement, plants, animals and the rare sediments through which archaeologists and Quaternary scientists reconstruct a broad interval.

In archaeological terms, this falls within the later part of Marine Isotope Stage 3, a fluctuating phase of the last Ice Age, and within the Irish Midlandian glaciation. Ireland was not yet at the maximum extent of the final British–Irish Ice Sheet, but neither was it a stable, uniformly ice-free country. Ice growth, retreat and local persistence varied greatly by region. The familiar map of Ireland, its modern coastline, wooded vegetation and settled countryside are therefore all misleading starting points for imagining this time.

A Date Within a Range

The most illuminating Irish evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks there exposed a sequence within a drumlin: glacial till below, organic freshwater silts and fine sands in the middle, and another thick till above. Till is the unsorted mixture of clay, stones and other debris deposited directly by glacier ice. The order of these layers is exceptionally valuable. It demonstrates that ice had occupied the locality, that an interval followed in which water, sediment and living things accumulated, and that a later advance of ice buried and preserved that short-lived landscape.

Organic material from this freshwater series produced the radiocarbon determination Birm-166, conventionally dated to 30,500 radiocarbon years BP, with an uncertainty of more than a millennium. Radiocarbon years are not calendar years: concentrations of atmospheric carbon-14 have changed through time, and measurements must be calibrated against independently dated records. Published calibration places the Derryvree material broadly at about 36,900–31,700 calibrated years BP, approximately 34,950–29,750 BCE. The requested year lies inside that wide span, but cannot be attached to a particular sediment layer, plant, insect, animal or season within it.

This limitation is central rather than merely technical. Derryvree is evidence for conditions during a broad middle-Midlandian interval; it is not a photograph of Ireland in 31,119 BCE. Nor can one wetland in Fermanagh stand for every valley, upland or coastal plain. Nevertheless, it is among the strongest surviving Irish records for understanding what an ice-free or lightly glaciated locality could support during this unsettled age.

The Freshwater World Beneath the Drumlin

The Derryvree deposits indicate cold, open country rather than forest. Their plant and insect evidence has been interpreted as a treeless tundra or muskeg-like environment: wet, peaty ground and shallow freshwater amid low vegetation, with severe winter conditions and a brief productive season. Mosses, sedges, grasses, herbs, dwarf shrubs and aquatic plants could exploit saturated ground and sheltered pools. Such evidence supports the existence of a freshwater basin and surrounding wetland; it does not justify imagining a uniform blanket of tundra across the whole island.

Freeze–thaw would have shaped everyday physical conditions more decisively than any human activity detectable in the record. Water could collect in hollows during thaws; frost could heave soils, disrupt drainage and limit tree growth. The contrast between the organic silts and the tills enclosing them records a profound regional rhythm: a landscape briefly able to sustain plants, invertebrates and grazing animals, then overtaken or sealed by renewed glacial action. Later ice destroyed much evidence elsewhere, which is one reason Derryvree’s buried sequence matters so greatly.

The wider ice-sheet history remains an active research field. Recent British–Irish Ice Sheet reconstructions show that advance was asynchronous: different sectors grew, reached their greatest extents and retreated at different times. A broad ice-sheet maximum came later, principally during the interval after about 27,000 calibrated years BP, with a reconstructed maximum ice volume around 23,000 years BP. At roughly 33,000 calibrated years BP, therefore, Ireland should not be described simply as either wholly frozen or wholly open. The better description is a geographically varied cold-stage landscape whose ice margins and habitable patches shifted over long timescales.

Animals in a Changing Corridor

Caves in the Blackwater valley of County Cork, especially Castlepook or Mammoth Cave near Doneraile, provide another important but differently formed archive. The cave assemblage includes remains of woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. These are compelling evidence that Ireland was repeatedly reached by animals associated with cold, open environments during the last glacial cycle. They also show that the island’s Pleistocene fauna was far richer and less familiar than the fauna of historical Ireland.

Care is needed, however. Many Castlepook bones were recovered in early excavations, from deposits disturbed by excavation, cave processes and later activity. The remains do not form a neatly sealed community living together on one day, or even necessarily in one century. Improved radiocarbon pretreatment and redating have revised several ages, pushing parts of the MIS 3 fauna significantly earlier than older determinations suggested. The evidence permits a broad conclusion—large herbivores and their predators used Irish landscapes before the Last Glacial Maximum—but not a precise reconstruction of which animals stood beside the Derryvree wetland in 31,119 BCE.

Reindeer are especially relevant to the image of this landscape because they were adapted to open northern environments and occur in the Irish Pleistocene record. Mammoths and giant deer imply substantial forage in at least some accessible areas; hyaenas, wolves and bears indicate carnivore and scavenger communities. Yet each fossil is evidence of an animal's presence, not a census. The absence of a species at a site may reflect preservation, collection history or a particular habitat as much as genuine absence from Ireland.

People: A Question, Not a Society

No securely excavated Irish camp, stone-tool assemblage, dwelling, grave or human bone currently allows historians to describe a resident human community at this date. Consequently there is no evidential basis for political affairs, diplomacy, named groups, religious institutions, formal learning or established trade networks in Ireland around 31,119 BCE. It would be inappropriate to invent chiefdoms, hunting territories, ritual practice or a calendar merely because modern humans lived elsewhere in Europe.

A reindeer femur from Castlepook has nevertheless made this period an important archaeological question. A mark on the bone has been interpreted as made by a sharp stone tool, and the animal has been reported as dating to around 33,000 years ago. If that taphonomic interpretation is upheld, it would indicate human handling of a reindeer in Ireland during MIS 3 and would greatly extend the island's known human story. But the bone comes from a legacy collection rather than a modernly excavated occupation floor. A radiocarbon result dates the animal's death, while identifying a mark as a cut from butchery is a separate judgement. The find is therefore a significant claim of possible human activity, not proof of a settled population or an event in this exact year.

Even a confirmed butchery episode would imply only a brief human presence: perhaps mobile foragers crossing a cold landscape, exploiting a carcass and moving on. It would not demonstrate permanent settlement, family continuity, exchange systems or cultural traditions within Ireland. The securely evidenced human record becomes much clearer only far later, after the climatic and geographical transformations of the terminal Pleistocene.

Coasts, Connections and Silence

Lower global sea levels altered the outlines of north-western Europe, but precise routes between Ireland, Britain and the continent remain debated and changed through time. Geological work has challenged simple assumptions of a long, continuous Irish land bridge, while more recent palaeogenetic work on cave sediments supports faunal connectivity with wider Eurasian populations before the Last Glacial Maximum. For this date, the safest conclusion is that animals—and possibly people—had opportunities to reach Ireland during changing glacial and sea-level conditions. The precise route, duration and character of every connection are not established.

There can be no demonstrated Irish economy in the later historical sense. No fields, livestock, houses, boats, mines, traded artefacts or managed herds are known from this horizon. The only securely visible “economy” is ecological: plants converting a short growing season into forage; herbivores ranging through open ground; carnivores and scavengers following prey and carrion; and water concentrating life in wetland niches. If people were present, their subsistence would have been dependent on this unstable environmental mosaic, but the Irish record does not yet reveal its details.

Thus the history appropriate to 31,119 BCE is neither empty nor a tale of lost kingdoms. It is the history of a sedge-fringed freshwater basin at Derryvree, sealed between episodes of glaciation; of cold-adapted mammals known from caves in Cork; and of scientific methods that convert fragmentary deposits into carefully bounded knowledge. Ireland at this point was a place of environmental possibility under pressure: locally capable of supporting life, but vulnerable to the returning ice that would conceal much of its evidence for tens of millennia.

Chapter 083 of 100

31118 BCE

Fermanagh's Subglacial Bogbean^[83]



31,118 BCE is a modern chronological label, not a year that anyone in Ireland could have recorded, named or commemorated. It falls roughly 33,070 calendar years before AD 1950, the conventional reference point for “before present” dates. At such depth in time, calendar-year precision is unavailable. The responsible account is therefore built from calibrated ranges, buried sediments, cave fauna and ice-sheet evidence rather than from dated events. Around this notional year, Ireland belonged to the Late Pleistocene, within the climatically unstable Marine Isotope Stage 3 of the last Ice Age.

A Date Within a Range

The closest Irish environmental archive is at Derryvree, near Maguiresbridge in County Fermanagh. A road cutting exposed organic freshwater silts and fine sands preserved between two bodies of glacial till: unsorted sediment deposited directly by ice. Their order tells an important story. Ice affected the locality; a wet, ice-free interval then allowed freshwater deposits and living communities to accumulate; later glacial activity buried the record beneath further till.

Organic matter from the Derryvree bed yielded a conventional radiocarbon determination of 30,500, with an uncertainty of roughly 1,100 radiocarbon years. Radiocarbon years are not calendar years, especially so far back: atmospheric carbon-14 changed through time, and calibration converts a laboratory measurement into a probability range rather than an exact date. Published calibrations have placed the deposit broadly at about 36,900–31,700 calibrated years before present, or approximately 34,950–29,750 BCE. The requested year lies within that broad window, but cannot be attached to a particular plant, pool, animal or human action. Derryvree is an environmental sequence accumulated over millennia, not a diary.

Fresh Water Between Advances

The evidence from Derryvree establishes a treeless, cold and wet landscape. Pollen, plant macrofossils, mosses and insects were recovered from the organic sediments. They point to open tundra or tundra-steppe vegetation, with sedges, grasses, herbs and low-growing plants rather than the oak, hazel and elm woodland associated with much later prehistoric Ireland. A fossil seed of bogbean, *Menyanthes trifoliata*, is particularly evocative. This is a plant of shallow freshwater margins and marshes, demonstrating that local water bodies and wet ground existed despite the severe regional climate.

Mountain-avens and other cold-adapted plants indicate exposed ground and short growing seasons. Mosses are important because they can preserve local conditions more precisely than pollen carried over long distances. A few tree-pollen grains do not prove that woodland stood nearby; they may have blown in from afar or been reworked from older sediments. The stronger conclusion is that the Fermanagh basin supported a patchwork of cold-water pools, marshy ground and sparse open vegetation. Seasonal thaw would have produced waterlogged hollows even while frost action, long winters and periglacial processes shaped the wider terrain.

Not an Unbroken Freeze

“Ice Age” should not suggest that every part of Ireland was continuously sealed beneath one uniform ice sheet. The Derryvree deposit exists because there was an interval sufficiently ice-free for a freshwater ecosystem to form. At Crag Cave in County Kerry, uranium-thorium dates from stalagmites show that calcite growth occurred episodically during Marine Isotope Stage 3. Dripstone can grow only when liquid water moves through soil and limestone above a cave. These records therefore support the view that the long cold stage contained milder or wetter episodes, although they do not show that Fermanagh and Kerry shared the same weather at the same moment.

Interpretation becomes less secure when moving from local deposits to a map of the entire island. The exact extent of Irish ice during earlier parts of the Midlandian glaciation remains debated, because later glaciers eroded and rearranged older surfaces. What is secure is that major ice expansion lay ahead: the maximum phase of the last British–Irish Ice Sheet is generally placed much later, around 26,000–20,000 years ago, varying by sector. Around 31,118 BCE, Ireland was already part of a changing cold-world system, but not simply the featureless ice-covered island of popular imagination.

Castlepook’s Animal Evidence

County Cork provides a second, very different archive. Castlepook Cave, near Doneraile in the Blackwater valley, has yielded Ireland’s richest known assemblage of pre-Last Glacial Maximum vertebrate remains. Its deposits include bones of woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena. The Irish Quaternary Fauna Project concluded that a broad range of mammals reached Ireland between at least about 45,000 and 20,000 years ago. This establishes that Ireland was not biologically isolated from the wider north-west European landmass throughout the period.

Yet cave assemblages must not be treated as a single instant photograph. Castlepook was excavated largely in the late nineteenth and early twentieth centuries, while cave sediments had been disturbed, mixed and accumulated through varied processes. Carnivores dragged in prey; animals died naturally;

water moved bones; excavators worked before modern recording standards. Direct dates on individual specimens are therefore more useful than old layer labels, but even radiocarbon results from the 1990s have required reassessment as laboratory pretreatment has improved. The fauna demonstrates a changing Late Pleistocene animal world in Ireland, not necessarily one herd, one predator community or one season at 31,118 BCE.

Reindeer are especially relevant to the landscape suggested at Derryvree. They are compatible with open, cold country and seasonal movement across broad grazing terrain. Mammoth and giant deer signal that large herbivores could enter Ireland during favourable phases; hyaenas and wolves indicate predators and scavengers exploiting those animals. Their presence has implications for food webs, movement corridors and habitats, but it does not justify imagining an intact “mammoth-steppe” everywhere on the island. Ireland’s Atlantic setting, wet ground, limestone caves, rivers and changing ice margins created local ecological mosaics.

The Human Question

There is no securely excavated settlement, hearth, stone-tool assemblage, burial or dwelling in Ireland that can be assigned to this precise period. Consequently, there is no evidence for political communities, rulers, warfare, diplomacy, religious institutions, formal learning or trade networks in the ordinary historical sense. No language spoken in Ireland can be identified, and no later Irish tradition can responsibly be projected back into this time.

A reindeer femur from Castlepook has nonetheless made the question of human presence more urgent. It has been presented as bearing a mark made on fresh bone by a sharp stone implement and has been publicised as evidence that people may have butchered reindeer in Ireland about 33,000 years ago. If that interpretation withstands continued specialist scrutiny, it would be evidence for a brief Upper Palaeolithic visit or activity episode, not proof of permanent settlement. The bone was not necessarily cut inside the cave; it may be discarded material later moved into the cave system. A radiocarbon measurement dates the animal bone, while the identification of a cut mark is a separate taphonomic judgement. Those two evidential steps must remain distinct.

Mobility Rather Than Society

The most that can responsibly be proposed for human life is conditional. Small, mobile hunting groups elsewhere in north-west Europe used stone tools, fire, animal food and skin clothing, and followed seasonal opportunities. If people reached Ireland during this interval, their activities may have centred on large-animal carcasses, temporary stopping places and routes made more accessible by lower sea levels. But no Irish material culture currently permits a reconstruction of their camp routines, kinship, beliefs, exchange practices or relations with other groups. Absence of evidence is partly a consequence of later glacial erosion and rising seas, which removed or submerged many possible sites; it is not positive evidence that people certainly were absent.

The economy that can be demonstrated is ecological rather than human. Wetlands supported aquatic plants and insects; open ground fed herbivores; predators and scavengers exploited carcasses; seasonal water and frost repeatedly altered the usable landscape. Any human economy remains hypothetical. There is likewise no basis for claims of Irish trade, maritime travel or diplomacy. Mainland connections and lowered sea levels made movement across the broader region more feasible than in later times, but the actual routes by which animals, and perhaps people, reached Ireland remain uncertain.

What This Year Can Mean

The significance of 31,118 BCE lies not in a named event but in an unusually fragile body of evidence. Derrynree preserves freshwater life during an ice-age interval because it was sealed between glacial deposits. Castlepook preserves bones because caves can trap, protect and concentrate remains otherwise lost from the landscape. Crag Cave preserves mineral growth that records episodes when water could percolate through the ground. Together these archives show an Ireland of cold open habitats, active wetlands, large mammals and profound environmental instability.

They also set firm limits on storytelling. This was not an Ireland of kingdoms, monuments or recorded ancestors. It was a landscape repeatedly transformed by climate and ice, where animal populations entered and vanished, and where a possible human trace remains compelling but unresolved. Modern calendar precision can supply the label “31,118 BCE”; archaeology can supply calibrated ranges and carefully tested observations. Between them lies a deep past best understood not as silence, but as evidence that must be read at the scale on which it survives.

Chapter 084 of 100

31117 BCE

Maguirebridge's Sedge and Sand^[84]



31,117 BCE is a modern chronological label, not a year for which Ireland possesses an event record. No contemporary Irish calendar, settlement sequence or written testimony can resolve a particular season, generation or individual at this point in the Late Pleistocene. The responsible approach is therefore to place the date within broad scientific ranges. Measured from AD 1950, it falls roughly 33,066 calendar years before present, within the Middle Midlandian phase of the last glacial cycle. The closest useful Irish evidence is a freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh, whose published radiocarbon determination of 30,500 $\pm$ 1,170/–1,030 radiocarbon years BP has been calibrated broadly to about 36,900–31,700 cal BP, or approximately 34,950–29,750 BCE. That range encompasses 31,117 BCE, but does not date a particular moment within it.

The distinction matters. Radiocarbon laboratories measure residual carbon-14, not BCE years directly; calibration converts that measurement through curves based on independently dated natural archives. At this antiquity, ranges are substantial and may be revised as methods improve. Nor was Derryvree a miniature Ireland. It was one locality, sampled through a temporary road cutting in 1969. Its great value lies in the sequence preserved there: it documents a changing environment at a place that later ice buried, rather than offering a national snapshot or a story of a named community.

Between Two Ice Advances

Derryvree's evidence was exposed when works cut obliquely through a drumlin, the streamlined hill formed from glacial sediments. Archaeologists and Quaternary scientists found organic freshwater silts and fine sands enclosed between two thick, distinct sheets of till: unsorted debris deposited by glacier ice. The order of these materials is the primary evidence. First, ice had reached the site and laid down the

lower till. Later, local glacier cover was absent long enough for shallow fresh water, fine sediment and organic matter to accumulate. Finally, another ice advance overran and sealed the deposit beneath an upper till. The buried bed is consequently a rare record of an ice-free interval within a longer cold-stage history.

Its fossils indicate an open, treeless, periglacial landscape, described by the original investigators as tundra or muskeg-like. Grasses, sedges, herbs, juniper and mosses point to low vegetation able to tolerate cold, exposed conditions; wetland and aquatic remains show that water persisted in and around the basin during at least part of the year. This was not a forested Ireland, nor an empty, featureless ice desert. It was a mosaic in which shallow pools, saturated ground, frost-affected soils and patches of sparse vegetation could coexist. Snowmelt, seasonal freezing and thawing would have shaped the ground as powerfully as rainfall.

A Cold Country, Not Yet the Maximum

At around this broad date, Ireland stood within Marine Isotope Stage 3, a climatically unstable portion of the Late Pleistocene. Conditions were cold in comparison with the present, but the full extent of the later Last Glacial Maximum had not yet been reached. Modern reconstructions of the British–Irish Ice Sheet place major expansion after roughly 35–32 thousand years ago, with maximum limits in many sectors later, around 27–21 thousand years ago. The Derryvree sequence is therefore especially important: it demonstrates that north-central Ireland could be ice-free during part of this earlier interval, before renewed and more extensive glaciation.

This should not be converted into a neat map of an entirely open island in 31,117 BCE. Ice margins changed through time, and evidence is unevenly distributed. A site free of glacier ice in Fermanagh does not prove that every coastal, upland or western district was similarly accessible. Conversely, later ice and erosion removed or obscured much of the earlier record. The physical Ireland of this period was also geographically different. Lower global sea levels altered coastlines and continental shelves, but the existence, position and duration of practical crossings between Ireland, Britain and mainland Europe remain complicated questions of sea level, ice, water depth and local topography. Animal remains show that colonisation occurred; they do not identify a simple, permanent land route.

Animals in the Evidence

Southern Irish caves provide a complementary, though more problematic, archive. Castlepook Cave, also called Mammoth Cave, near Doneraile in County Cork is Ireland's principal site for mammals from the last cold stage. Its collections include remains attributed to reindeer, mammoth, giant deer, wolf, fox, bear, spotted hyena and lemmings. The National Museum of Ireland's Castlepook hyena material is a tangible reminder that Ireland once supported predators and prey foreign to the modern fauna. Radiocarbon work places movements of hyena and other mammals into Ireland broadly between about 45,000 and 30,000 years ago.

Yet cave collections demand caution. Much of Castlepook was excavated in the early twentieth century, before modern recording standards, and bones came from deposits that may have been disturbed or mixed. Reassessment using improved pretreatment and dating methods has shown that some earlier determinations are unreliable. It is not safe to arrange every animal in the collection into one simultaneous

herd, food web or year. The defensible conclusion is narrower but still striking: during parts of Marine Isotope Stage 3, Ireland supported or received a diverse cold-stage fauna, and the island's ecological history was more varied than its sparse archaeological record might suggest.

The Human Question

There is no securely excavated settlement, hearth, stone-tool assemblage, burial or dwelling in Ireland that can be assigned to 31,117 BCE. Consequently, there is no basis for describing a resident population, a language, a social hierarchy or a territory. One reindeer femur from Castlepook has been presented by zooarchaeologist Ruth Carden as bearing a deep mark made by a sharp stone tool during carcass processing, and has been publicised as evidence for human activity around 33,000 years ago. If that interpretation and its chronological association are sustained, it would be extraordinarily important: potentially an early indication that people reached Ireland during the Upper Palaeolithic.

But a single modified bone is not a settlement, and it cannot establish hunting methods, the size of a group, seasonal residence or a continuous human presence. The bone was recovered from an old cave collection, while no associated tools have yet been found. The most that can responsibly be inferred is the possibility of a brief visit by highly mobile people who possessed stone-edged technology and processed an animal. Even that remains a specific interpretation requiring further contextual excavation, taphonomic study and direct dating. Recent work at Castlepook has sought surviving undisturbed Pleistocene deposits precisely because the old collections alone cannot answer these questions.

Society Beyond Recovery

Political affairs, warfare and diplomacy are therefore not merely undocumented for this date; they are categories for which the evidence is absent. Ireland had no known kingdoms, leaders, borders, monuments or institutions in the archaeological sense. It would be misleading to transfer the social world of later prehistoric Ireland backwards into a landscape tens of millennia older. If people did enter the country, their movements were more likely governed by season, weather, animal availability and the hazards of crossing a changing north-west European landscape than by formal political boundaries.

The same restraint applies to everyday life. There is no Irish evidence from this narrow period for houses, clothing, cooking places, boats, storage, tools, ornament or art. Cold-stage ecology permits reasonable general observations about the challenges any visitor would have faced: exposure, short growing seasons, uneven resources and the need for mobility. It does not reveal what a particular family ate at Derryvree, where a camp stood, or whether people returned in subsequent years. The distinction between ecological possibility and archaeological proof is essential.

No Farms, Markets or Shrines

There was no agriculture in Ireland at this time. Fields, livestock, cereal cultivation, pottery and permanent villages belong to a vastly later Neolithic world. Nor is there evidence for trade in the ordinary historical sense. Animal dispersal and the possible movement of people imply connectivity beyond Ireland, but no imported artefact or exchange network can be assigned to 31,117 BCE. In strictly human terms, the economy is unknown. In environmental terms, the crucial economy was biological: sparse vegetation sustained herbivores where conditions allowed, while large predators and scavengers exploited those animals and, in caves, sometimes accumulated their bones.

Religion, art, formal learning and oral tradition cannot be recovered from the Derryvree sediments or the Castlepook fauna. It is reasonable to recognise that people elsewhere in Europe possessed sophisticated cultural traditions during the Upper Palaeolithic; it is not evidence that any particular Irish group did so in this year. The most reliable intellectual achievement visible here is modern rather than prehistoric: the ability of palaeoecology, stratigraphy, radiocarbon science and zooarchaeology to read traces left in mud, bone and ice-laid sediment.

An Archive Rather Than an Anniversary

The lasting significance of this notional date lies in the scale of environmental change it represents. Derryvree preserves a freshwater interval between glaciations: sedge-rich wet ground and shallow water later compressed beneath a drumlin. Castlepook preserves a separate record of animals that could enter and survive in cold-stage Ireland, though not all at once and not necessarily in the same landscape. Together, they correct two opposite misconceptions: that Ireland was simply ice-covered throughout the Late Pleistocene, and that a precise modern year can be populated with confident detail.

For 31,117 BCE, the evidence supports an Ireland of open, cold and regionally varied environments, with at least some ice-free ground and freshwater habitats during the wider dated interval. It supports the presence of cold-adapted mammals in Ireland during this broad phase, and it raises, but does not settle, the prospect of very early human visits. Everything more exact—a particular hunt, camp, conflict, belief or journey—belongs to interpretation beyond the present evidence. That uncertainty is not an empty gap in the story. It is the central historical fact of Ireland at this depth of time.

Chapter 085 of 100

31116 BCE

Derryvree–Castlepook Horizon^[85]



31,116 BCE is a modern chronological label, not a date that can be recovered as a lived Irish year. No calendar, named community, settlement surface or historical event can be assigned to this particular twelve-month interval. In calendar terms it falls roughly 33,000 years before the radiocarbon convention's "present" of AD 1950, within the Late Pleistocene and Marine Isotope Stage 3. At this depth in time, chronological precision comes from measurements with substantial uncertainty, and radiocarbon ages must be calibrated into ranges rather than converted into an exact anniversary. The responsible subject is therefore Ireland around this broad horizon: a cold, unstable Ice Age landscape known through a very small number of buried sediments, cave bones and later scientific reassessments.

A Date Within Ranges

The closest Irish environmental archive is at Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and exposed freshwater silts, fine sands and organic deposits trapped between two thick beds of till, sediment laid down by glacier ice. The sequence is clear in its basic order: an earlier ice advance deposited the lower till; a period without ice at that spot allowed freshwater and wet ground to develop; a later advance covered and preserved the deposit beneath another till sheet.

Organic material from the Derryvree series produced the conventional radiocarbon result BIRM-166, 30,500 radiocarbon years before present, with an uncertainty of +1,170/–1,030 years. That determination is not the same thing as a calendar date. Calibration is essential because atmospheric radiocarbon levels have varied, while the part of the calibration curve this far back is necessarily less precise than that for

recent millennia. Scholarship can therefore place the Derryvree evidence broadly in the climatic world relevant to the requested date, but cannot say that its plants grew, its insects lived, or its water lay open in 31,116 BCE itself.

This distinction is more than a technicality. It prevents a false historical confidence. A sediment layer records a phase of environmental conditions accumulated over time; it is not an annual chronicle. The same caution applies to fossil bones. A date on a bone concerns when the animal died, within a statistical range. It does not automatically establish when the animal entered a cave, whether it was moved by a predator, or whether people were present.

Fermanagh's Open Wetland

Derryvree nevertheless offers an unusually vivid local picture. Its organic silts contained pollen, plant remains and animal evidence indicative of open tundra vegetation and a periglacial regime: ground subject to severe cold and seasonal freezing rather than a familiar wooded Ireland. The record includes plants associated with wet, cold and exposed habitats. Fossil evidence for dwarf willow, mountain avens, bogbean and alternate water-milfoil is particularly valuable because it shows both sparse terrestrial vegetation and standing or slow-moving freshwater. Mosses, sedges and low herbs would have occupied saturated margins, while shallow pools offered a different habitat from the drier, frost-affected ground nearby.

That does not mean every part of Ireland looked identical. Derryvree was a particular basin in Fermanagh, not a map of the whole island. Yet it demonstrates that, during a Middle Midlandian interval, at least one northern locality supported a cold, treeless wetland rather than being continuously buried beneath glacier ice. The landscape was likely a mosaic of water, sedge-rich ground, dwarf shrubs, herbaceous tundra and exposed mineral soils. Long winters, short growing seasons and repeated freezing and thawing would have governed its character.

The wider North Atlantic climate was volatile. Marine Isotope Stage 3 contained abrupt shifts between comparatively milder interstadial conditions and colder stadial ones. Ireland lay on the western edge of north-west Europe, where ice, sea level, weather systems and vegetation could alter markedly over periods much shorter than later archaeological eras. The Derryvree succession proves local environmental change between two glacial episodes; it does not permit the neat correlation of its individual beds with a single Greenland warming, European cultural phase or island-wide advance of ice.

Animals and Cave Archives

For the animal world, Castlepook Cave near Doneraile in north County Cork is crucial. Also called Mammoth Cave, its passages yielded more than 2,000 bones during excavations in the early twentieth century. The cave is Ireland's richest known archive for vertebrate life in the long period leading towards, through and after the Last Glacial Maximum. Its dated specimens span a broad interval, not one moment. Water movement, carnivore activity and the methods of early excavation have complicated the original deposits, so the assemblage must not be treated as a single community caught together.

Even with that qualification, Castlepook establishes that a striking range of cold-stage mammals reached Ireland at different points in the Late Pleistocene: woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, followed in later phases by Arctic fox, wolf and two kinds of lemming. The

presence of hyaena is especially informative. Caves could be dens and bone-accumulating places as well as shelters; carnivores may have transported parts of carcasses into them. This helps explain why a cave bone is powerful evidence for fauna but less straightforward evidence for a human campsite.

Such animals support an interpretation of open country with grazing and browsing opportunities, but they do not licence a painted panorama in which all species stand together beside Derryvree in one season. Fossil occurrence establishes that a species reached Ireland during a dated interval. It does not prove its abundance across the island, its exact seasonal movements, or its coexistence with every other dated specimen. The physical geography also differed from today because lower sea levels exposed continental shelves, but the exact routes available at any given time depended on changing coastlines, ice margins and water barriers.

The Marked Reindeer Femur

Castlepook has acquired exceptional archaeological importance through a reindeer femur reported as about 33,000 years old. Zooarchaeologist Ruth Carden identified a deep linear modification on the fresh bone and interpreted it as a mark made by a sharp stone tool during carcass processing. If that assessment is confirmed, the object is potential evidence that people handled a reindeer in Ireland in the Upper Palaeolithic, vastly earlier than the well-established record of post-glacial settlement. County Cork heritage material accordingly presents the find as a major opening for research into an otherwise almost invisible human past.

But the word *potential* is indispensable. The bone came from an old cave collection rather than a modern excavation of an intact, fully recorded occupation floor. No securely associated hearth, house, stone-tool assemblage, burial, repeated butchery area or human remains of comparable age have been recovered in Ireland. A cave whose contents were disturbed by water and carnivores cannot by itself reveal whether people killed the animal locally, processed it elsewhere, visited once, returned seasonally, or ever entered the cave. Nor can one specimen establish a continuous population or the ancestry of later Irish communities.

The reindeer femur should therefore be treated neither as a trivial curiosity nor as proof of an imagined Ice Age tribe. It is a specific, testable claim: a dated animal bone may preserve human modification. Further microscopic study, direct publication of the dating evidence, new cave excavation and the discovery of securely stratified stone artefacts would all strengthen or challenge its interpretation. Until then, the evidence supports a possibility of fleeting human activity, not a settled Palaeolithic Ireland.

No Politics, No Recorded Conflict

There is no evidence from Ireland around this horizon for political institutions, rulers, territorial diplomacy, organised warfare, language, religious rites, formal learning or trade networks. There are no farms, fields, houses, pottery, graves, monuments or written signs from which daily social arrangements could be reconstructed. It would be misleading to fill these absences with assumptions drawn from better-known Upper Palaeolithic societies elsewhere in Europe.

If people did visit Ireland, their economy may have involved the opportunistic acquisition and processing of large animals, as the reindeer femur has been interpreted to suggest. That is an inference from one contested object, not a demonstrated subsistence system. No evidence presently supports

farming, herding, permanent villages, long-distance commerce or political leadership. “Society” at this date is therefore better approached through the limits of the record: animals adapted to a demanding landscape are securely attested; people are possible but archaeologically elusive.

Iceward Change

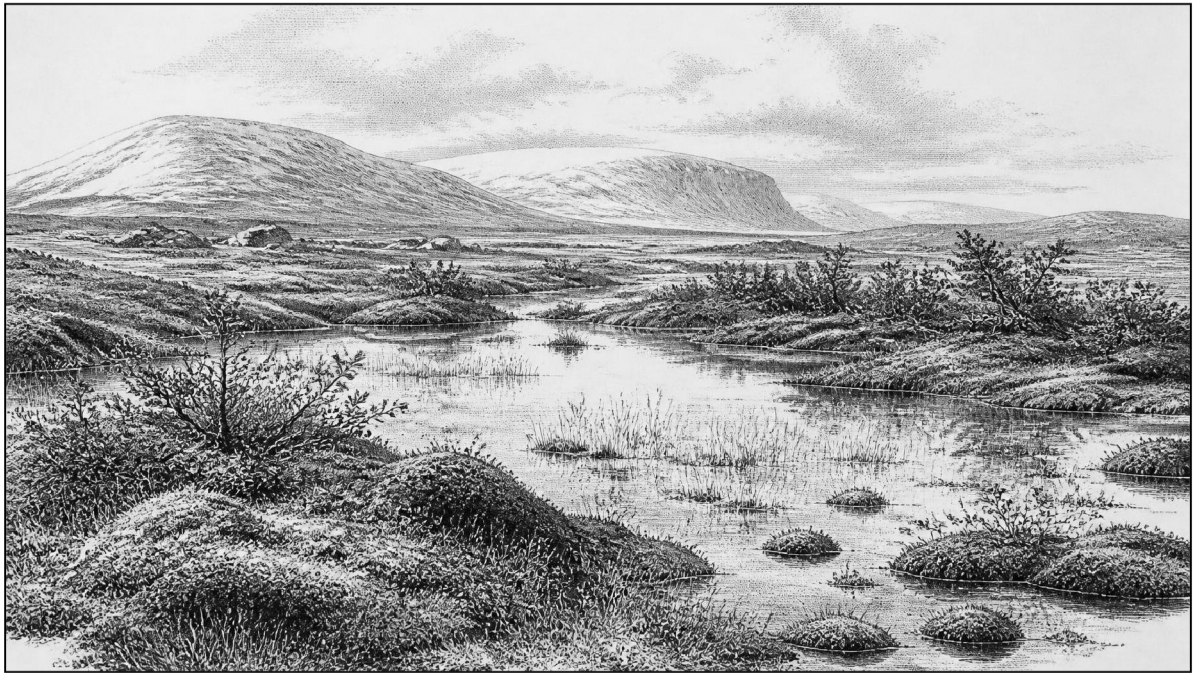
The most important long-term development was environmental rather than political. Ireland was moving towards the growth and eventual maximum extent of the British–Irish Ice Sheet. Modern reconstructions show that ice-sheet advance and retreat were asynchronous across Ireland and Britain, and that the maximum ice volume occurred much later, around 23,000 years before present. At roughly 33,000 years ago, the island should not be simplified as either wholly ice-covered or wholly ice-free. Derryvree’s freshwater layer is direct proof of a local ice-free interval; later till above it records renewed glaciation.

Later ice also explains much of the silence. Glacial erosion and redeposition removed, buried or disturbed older land surfaces, while rising post-glacial seas submerged parts of the former landscape. The odds against preserving a brief campsite, an exposed kill site or a trackway were therefore high. Ireland around 31,116 BCE is not empty of history. Rather, it is a history whose surviving witnesses are a sealed Fermanagh wetland, a complex Cork cave archive, a handful of dated bones and the disciplined uncertainty required to read them.

Chapter 086 of 100

31115 BCE

Derryvree, Greenagho, Castlepook^[86]



The label 31,115 BCE is a modern chronological convenience, not a year that anyone in Ireland could have named, recorded or experienced as a fixed date. It equates approximately to 33,064 years before AD 1950, the reference point used for “before present” dating. At this depth of time, modern calendar-year precision is unavailable. There are no written records, settlements with annual sequences, named rulers or securely dated events. The responsible history of Ireland at this point is therefore a history of ice, water, animals, caves and sparse traces whose dates are measured in broad calibrated ranges.

This was the Late Pleistocene, within the latter part of Marine Isotope Stage 3, an unstable phase of the last Ice Age. Ireland was not yet the familiar green, wooded island of later prehistory. Nor should it be imagined as uniformly entombed beneath ice. The growth of the British–Irish Ice Sheet was regional and episodic, while climatic shifts altered glaciers, sea level, vegetation and animal habitats over centuries and millennia. The strongest evidence relevant to this date comes from buried freshwater deposits in County Fermanagh and faunal remains from limestone caves in north Cork.

A Date Within Ranges

Radiocarbon results are not calendar dates. The amount of radioactive carbon available in the atmosphere has changed through time, so a laboratory measurement must be calibrated against independently dated records. At more than 30,000 years ago, even improved calibration curves produce substantial probability ranges. Stratigraphy adds another qualification: a sediment layer may have accumulated over a period, while an animal bone dates the animal’s death rather than every later event in the history of that object.

The key Fermanagh sequence at Derryvree, near Maguiresbridge, produced a conventional radiocarbon age of about 30,500 radiocarbon years before present, with a large laboratory uncertainty. Published calibration places it broadly at about 36,900–31,700 calibrated years before present. The modern label 31,115 BCE, approximately 33,064 calibrated years before present, falls within that wide interval. This does *not* demonstrate that a particular pond, plant or insect existed in that precise twelve-month period. It does establish that the Derryvree deposits are among the closest Irish environmental evidence for conditions around this deep-time horizon.

Water Between the Tills

Derryvree was revealed by roadworks in 1969, which cut through a drumlin north-east of Maguiresbridge. Beneath the drumlin lay a remarkable sequence: a lower sheet of till, organic-rich freshwater silts and fine sands, and an upper sheet of till. Till is unsorted sediment deposited by glacial ice. The order of the deposits records an earlier glacial phase, followed by an ice-free interval in which freshwater sediment and organic matter accumulated, then a subsequent advance of ice that buried and protected the evidence.

The flora and fauna preserved in the intervening sediments indicate open tundra vegetation and a periglacial regime: a landscape strongly affected by freezing and thawing, but not necessarily itself covered by a glacier. Freshwater mosses and sedges grew around shallow water; remains also include plants associated with cold, open ground, among them lesser clubmoss. Insect evidence had a northern, cold-adapted character. The site has sometimes been described as a muskeg-like environment, a useful indication of wet, organic ground and pools, but it must not be turned into a modern landscape in miniature. Conditions would have been severe, the growing season restricted and local drainage shaped by frost, thaw and permafrost-like ground conditions.

Derryvree is especially valuable because it shows biological activity where later ice might otherwise seem to have erased all evidence. Yet it is a local archive rather than a weather report for every Irish region. Its wetland was one patch in a changing landscape. The later glacier that sealed it beneath till also shows how quickly the available habitat could be transformed. In practical terms, the defining force in Ireland around this period was not a human political order but climatic volatility and the advance or retreat of ice margins.

Nearby Greenagho, near Belcoo in County Fermanagh, provides an important comparison. Organic material from a lacustrine deposit beneath later till has yielded a legacy radiocarbon age of about 32,460 BP, conventionally calibrated to roughly 37,200–35,700 cal BP. The date has cautions attached, including its status as a minimum age, and it is earlier than the nominal year considered here. Nevertheless, Greenagho and Derryvree together demonstrate that north-central Ireland contained freshwater environments and ice-free ground during parts of the Middle Midlandian, before major later glaciation overwhelmed or remodelled much of the island.

An Island Approaching Greater Ice

At 31,115 BCE, Ireland lay within a wider north-west European zone of sharp climatic oscillation. The eventual Last Glacial Maximum is commonly placed later, broadly around 26,500–19,000 years ago globally, although the timing and extent of individual Irish ice lobes remain subjects of active

reconstruction. Evidence from marine sediments, landforms, exposure dating and buried organic horizons indicates that the British–Irish Ice Sheet did not behave as a single, static blanket. Some sectors expanded early; other areas retained ice-free or seasonally milder intervals.

That complexity matters for coasts and connections. Sea level was lower than today because much water was stored in continental ice sheets, exposing broader shelf landscapes in places. But lower sea level alone does not prove a continuous dry-land route between Ireland, Britain and continental Europe at this particular date. Sea passages, changing ice margins and local topography all mattered. The Irish evidence does not allow a secure reconstruction of a single travel corridor, nor does it show that people regularly crossed one. It does show a landmass whose shorelines, habitats and access routes differed greatly from later Ireland.

Castlepook's Faunal Record

In north Cork, Castlepook Cave near Doneraile—historically called Mammoth Cave—preserves another window on this broad period. Its older excavations recovered a rich assemblage accumulated over a long span and through more than one process: carnivores could drag prey into caves, animals could die naturally, water could move material, and early twentieth-century excavation did not record contexts to modern standards. The cave therefore cannot be read as a single campsite or a single moment.

Re-dating has nevertheless shown that parts of the Castlepook fauna belong to Marine Isotope Stage 3 and are substantially older than some earlier determinations suggested. The assemblage includes reindeer, woolly mammoth, giant deer, brown bear, wolf and spotted hyaena, as well as smaller cold-adapted animals. These species support the wider picture of open, cold landscapes capable of sustaining grazing herds, predators and scavengers during suitable intervals. They do not prove that all these animals met one another at the cave, or that each lived in Ireland in 31,115 BCE. The secure conclusion is temporal breadth: south-western Ireland was repeatedly accessible to a varied Pleistocene fauna before the Last Glacial Maximum.

Spotted hyaena is particularly revealing. At Castlepook it is represented by bones, teeth and coprolites, and the cave's galleries may have served as a carnivore den at times. Such evidence reminds us that caves were not naturally human refuges. They were active parts of an animal landscape, used intermittently and often dangerously by large predators and scavengers. A cave deposit may preserve bones exceptionally well, but its contents must be disentangled carefully before claims about behaviour can be made.

The Human Question

A reindeer femur from Castlepook has been reported to bear a deep incision interpreted by zooarchaeologist Ruth Carden as a sharp stone-tool mark made during carcass processing. County Cork heritage material presents the object as Palaeolithic and broadly circa 31,000 BC. If that interpretation is sustained, it is potentially Ireland's earliest evidence for human handling of an animal, and it makes this date unusually significant.

Its limits are as important as its promise. The femur comes from an old cave collection rather than a modernly excavated occupation floor. No securely associated hearth, stone-tool assemblage, dwelling, burial, butchered bone concentration or food store demonstrates a camp at Castlepook at this age. A

radiocarbon result dates the animal's death within a range; it does not independently date the incision, identify its maker or reveal where the animal was killed. The mark is best treated as evidence for a possible brief human episode, not proof that Ireland had a resident population.

If people did visit, they may have been a small and mobile Upper Palaeolithic party exploiting a reindeer carcass during a short incursion. Reindeer could provide meat, fat, hide, sinew, antler and bone, but the Irish specimen alone cannot demonstrate which resources were taken or how a group travelled. It cannot tell us their language, kinship, cultural affiliation or destination. Continental and British evidence confirms that people lived elsewhere in north-west Europe during this broad period, but those better-attested societies cannot simply be projected across the sea into Ireland.

No Politics, No Proven Religion

There is no evidence for political affairs, diplomacy, warfare, chiefs, territories or institutions in Ireland in 31,115 BCE. Nor can archaeology responsibly identify an Irish religion, artistic tradition, formal learning system or trade network at this date. The possible cut-marked femur may point to practical knowledge of stone tools and animal anatomy, but it does not establish a local craft tradition. Similarly, the movement of animals into Ireland indicates ecological connectivity, not commerce or organised exchange.

Everyday life is equally difficult to recover. There is no securely demonstrated settlement from which to describe houses, clothing, families or seasonal rounds. The most defensible social conclusion is negative but important: any human presence was, at most, sparse and transient in the evidence now available. The enduring inhabitants disclosed by the record are plants, insects and animals adapted to an unstable cold environment.

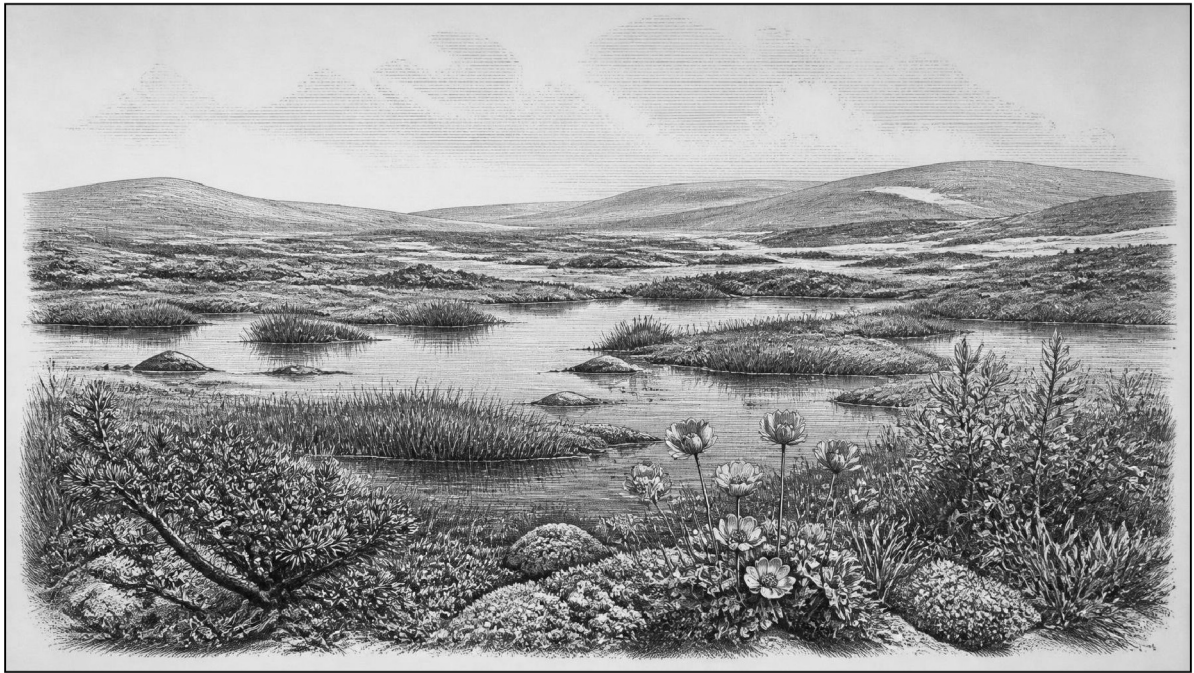
Landscape Rather Than Chronicle

The year label therefore conceals more than it reveals. Around 31,115 BCE, Ireland was a changing Late Pleistocene landscape in which freshwater wetlands could exist in Fermanagh between phases of glaciation, while cold-adapted mammals ranged through suitable habitats in Cork. Derrynvree provides the clearest environmental anchor; Greenagho widens the regional picture; Castlepook raises a compelling but unresolved question about people. The later growth of ice would bury, scour and fragment this world. What survives is not an annual chronicle, but a handful of extraordinary archives from which a cautious history can still be made.

Chapter 087 of 100

31114 BCE

Derryvree's Juniper Marsh ^[87]



“31,114 BCE” is a modern calendar label, not a year that anybody in Pleistocene Ireland could have named, recorded or experienced as a discrete historical date. In radiocarbon convention it lies roughly 33,063 calendar years before AD 1950, but that arithmetic does not turn it into an archaeologically visible year. The evidence is dated in ranges, often broad ones, and Ireland’s surviving record for this remote period is fragmentary. The responsible subject is therefore not an invented event in a particular year, but an Ice Age landscape whose conditions can be illuminated by deposits, animal bones and the developing chronology of the last British–Irish Ice Sheet.

A Date Within a Wide Range

The closest major Irish environmental archive is at Derryvree near Maguiresbridge, County Fermanagh. Road works in 1969 exposed a drumlin containing a remarkable sequence: glacial till below, freshwater silts and fine sands with organic material in the middle, and a later till above. Till is debris deposited directly by glacier ice. The sequence therefore securely establishes an order of events at that locality: ice had previously occupied it; a non-glacial interval then allowed a wetland or shallow freshwater body to form; and ice later returned and sealed the sediments beneath another layer of till.

Organic material from the Derryvree bed, laboratory code BIRM-166, produced a conventional radiocarbon age of 30,500 with an uncertainty of roughly 1,100 radiocarbon years. Radiocarbon years cannot simply be subtracted from 1950 and expressed as BCE dates, because atmospheric carbon-14 levels have varied. Calibration using the Northern Hemisphere curve instead produces a broad calendar interval; published discussions place Derryvree approximately within 36,900–31,700 calibrated years BP, or about 34,950–29,750 BCE. The nominal date 31,114 BCE falls within that broad span. It does not identify a particular season, plant, animal or phase of the wetland.

This limitation is central rather than disappointing. Derryvree is exceptionally valuable evidence for a cold, locally ice-free period in south Fermanagh during the later Pleistocene. It is not an annual diary, and it cannot be projected unchanged across the whole island. Its age, stratigraphic position and fossils nevertheless make it the best local guide to the kind of environment that could have existed in parts of Ireland around this point in deep time.

An Unstable Ice-Age Island

The wider setting was Marine Isotope Stage 3, a long phase of the last Ice Age marked by abrupt climatic shifts rather than one unbroken freeze. Ireland lay on the north-western edge of Europe, with sea levels far lower than today and the outlines of its coasts very different. It was not yet the wholly ice-covered landscape often imagined from the Last Glacial Maximum. The great British–Irish Ice Sheet was in a phase of growth and reorganisation. Recent syntheses treat the build-up of the ice sheet as beginning broadly after about 35–32 thousand years ago, while its maximum extent came later, principally around 27–21 thousand years ago.

That chronology should not be turned into a simple national map for 31,114 BCE. Ice sheets grow, thin and advance unevenly; evidence for their early stages is particularly difficult to preserve because later ice can erase it. Modelling and geological reconstruction suggest that small ice caps may have occupied uplands in north-west Ireland while other lowland areas remained ice-free or experienced periglacial conditions. Derryvree's two tills and intervening freshwater deposits fit this larger pattern of oscillation: an environment could be glaciated, become available for water and vegetation, and then be overwhelmed again.

For people standing in such a landscape, the most conspicuous political force was not a state or a chiefdom but climate. There is no evidence for rulers, territories, diplomacy, warfare, law or institutions in Ireland at this date. Nor is there evidence for permanent villages. The terms of everyday survival were set by winter cold, seasonal thaw, water availability, animal movements and the changing reach of ice. That is an interpretation based on the physical record, not evidence that any known group occupied Derryvree itself.

Marsh, Tundra and Open Water

The Derryvree fossils make the intervening landscape more vivid. Pollen, plant macrofossils, mosses and insect remains point to open, treeless tundra or muskeg rather than forest. Grasses, sedges, herbs and juniper were important elements of the vegetation. Fossils include mountain-avens, dwarf willow, bogbean and alternate water-milfoil. These are not merely botanical curiosities: together they indicate a cold environment with wet ground, mossy margins and standing or slow-moving freshwater, in a landscape exposed to frost and seasonal change.

Bogbean and water-milfoil are especially useful reminders that “Ice Age” did not mean featureless snow. The Derryvree bed preserves aquatic and wetland life. Open pools could support submerged plants; sedges and mosses could grow at their edges; dwarf willow and mountain-avens belonged to a low, open vegetation cover. Insects add ecological detail, suggesting plant-rich wet ground rather than bare glacial debris. Such evidence supports the picture of a periglacial wetland mosaic: cold, exposed and probably windy, but biologically active during favourable parts of the year.

It does not support a precise reconstruction of temperature, snowfall or summer length for 31,114 BCE. Nor does it prove that the entire island looked alike. Southern limestone districts, uplands, river valleys and land nearer active ice would each have differed. Yet the Derryvree sequence decisively overturns any assumption that Ireland was uniformly buried under ice throughout the whole later Pleistocene. At least in this part of Fermanagh, freshwater life and tundra vegetation occupied an interval between glacial advances.

Animals at Castlepook

County Cork supplies a complementary, though differently complicated, archive. Castlepook Cave, also called Mammoth Cave, near Doneraile has produced one of Ireland's richest collections of pre-Last Glacial Maximum animal remains. Improved radiocarbon pretreatment has shown that several earlier cave dates were too young, and that the cave's Marine Isotope Stage 3 fauna is older than previously believed. Reindeer, woolly mammoth, giant deer, brown bear, spotted hyaena, wolf, fox, hare and lemmings belong to the broader Ice Age community documented there.

The assemblage demonstrates ecological connection with Britain and continental north-west Europe during periods when animal populations could reach Ireland across landscapes very unlike the modern island setting. It does not mean that every listed species lived together at one moment, nor that a cave represents a normal sample of the surrounding countryside. Caves collect bones through predation, scavenging, natural death, water movement and human excavation. Castlepook was also investigated extensively in the early twentieth century, which complicates the survival and context of its deposits.

Spotted hyaena is particularly revealing. Its presence indicates that a large carnivore could exploit the Irish landscape in this earlier part of the last glacial cycle, while mammoth, reindeer and giant deer evoke an open-country fauna. The relationship was ecological, not historical in the usual sense: predators, scavengers and herbivores followed food, shelter and seasonal opportunity. There is no evidence from Castlepook for organised hunting territories, herding, animal domestication or an economy based on settled production.

The Human Question

One Castlepook reindeer femur makes the question of human presence unusually important. County Cork heritage publications describe a deep mark on the bone as an incision made with a sharp stone tool during butchery, and place the object at about 31,000 BC. If that diagnosis is sustained, it may be Ireland's earliest evidence that people handled and processed an animal. It would be compatible with a brief visit by mobile Upper Palaeolithic hunters or scavengers during the wider period represented by the bone.

The claim must remain carefully bounded. No securely associated stone-tool assemblage, hearth, dwelling, burial, occupation floor or large butchery deposit of comparable age has been recovered in Ireland. The bone was not excavated from a modern, sealed habitation layer, and the date of an animal's death does not independently date the mark, reveal who made it, show whether the animal was hunted or found dead, or establish where the carcass was processed. Carnivore damage, sediment movement and surface alteration require specialist taphonomic assessment. A possible cut mark is significant evidence, but it is not proof of a permanent population.

Accordingly, society around this date is largely unknowable in specifically Irish terms. If people did enter Ireland, the most restrained inference is that they were highly mobile foragers able to use stone edges and animal resources in a cold environment. We cannot responsibly name them, estimate their

numbers, reconstruct family life, or claim continuity with later Irish populations. There is no evidence for religious monuments, ritual sites, art, writing, formal learning or a distinctive local material culture. Absence of evidence is not proof that thought, belief or custom were absent; it means that none can presently be described from Irish finds of this age.

No Trade, No Politics, but Connected Landscapes

There is equally no evidence for trade in the later prehistoric sense: no imported goods, exchange networks, ports or established sea routes can be assigned to 31,114 BCE in Ireland. The important connections were environmental. Lower sea level and changing ice margins altered routes for animals and, potentially, people. Reindeer and other mammals indicate that Ireland was part of a wider north-west European ecological zone during favourable intervals. That biogeographical connection should not be confused with evidence for regular human travel or cultural exchange.

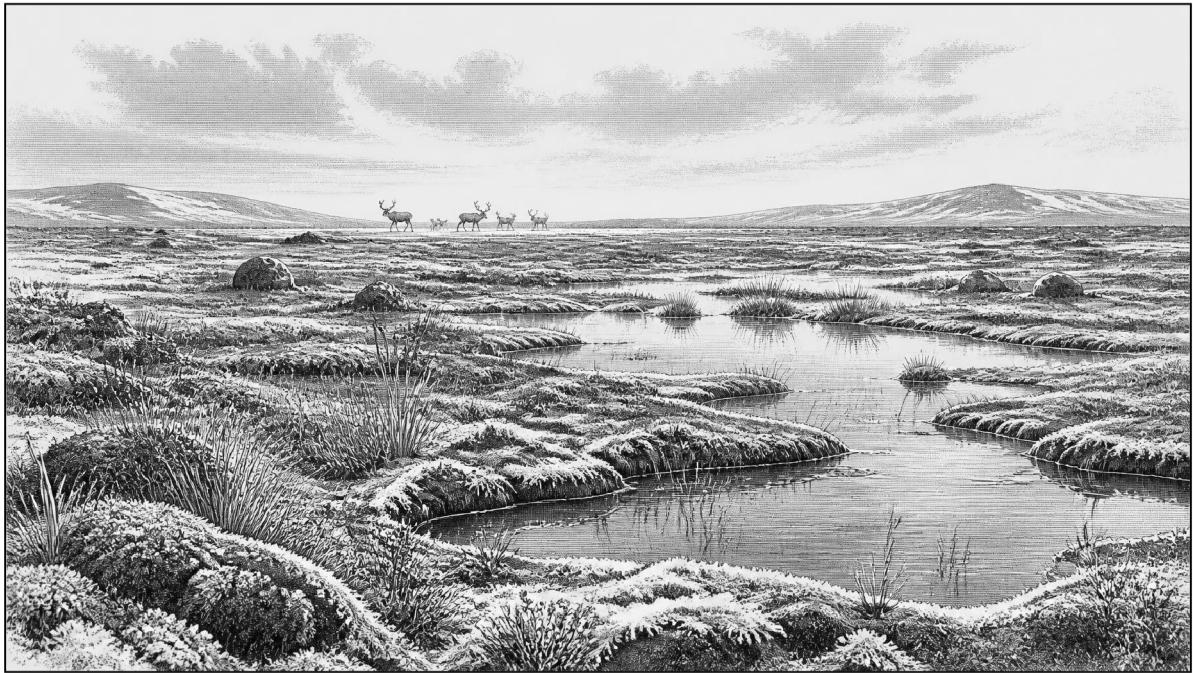
The most important development near 31,114 BCE was therefore the making of conditions rather than a recorded human event. In Fermanagh, freshwater sediment, plants and insects accumulated during an interval free of local ice. In Cork, caves preserved fragments of a much wider cold-stage fauna, along with a tantalising possible trace of human carcass processing. Later glacier advances would cover, disturb or remove much of this evidence. What survives is enough to show an Ireland of tundra wetlands, animal corridors and climatic uncertainty; it is not enough to populate that landscape with invented settlements, chiefs or ceremonies.

That restraint gives the period its real historical interest. Derryvree's buried marsh and Castlepook's bone assemblage are not empty preliminaries to later history. They record an older Ireland repeatedly transformed by ice, thaw and ecological movement, at a time when even the possibility of human presence remains a question being tested by new dating, excavation and careful re-examination of museum collections.

Chapter 088 of 100

31113 BCE

Mammoth Cave's Questioned Cut^[88]



31,113 BCE is a modern chronological label, not a year that could have been recognised in prehistoric Ireland. There was no Irish calendar, writing, state or historical chronicle from which an event could be dated so exactly. The responsible approach is therefore to locate this notional year within broader scientific ranges. It falls in the Late Pleistocene, during Marine Isotope Stage 3 and the Irish Midlandian cold stage, when climates fluctuated sharply and the British–Irish Ice Sheet was approaching, but had not yet reached, its later greatest extent.

Radiocarbon dates are conventionally measured before 1950 and must be calibrated against changing atmospheric carbon levels; they are not direct BCE dates. IntCal20 permits calibration back to 55,000 years before present, but it does not transform sediment, bone or pollen into an annual diary. Around the modern label 31,113 BCE, the best Irish evidence consists of environmental deposits, cave fauna and one potentially momentous but still limited bone modification. Together they show an island that could sustain life in severe cold, not a land for which politics or settled human society can be reconstructed.

A Freshwater Interval at Derryvree

The strongest local guide is Derryvree townland near Maguiresbridge, County Fermanagh. Road works in 1969 cut through a drumlin and exposed freshwater silts and fine sands sandwiched between two substantial tills: sediment left directly by separate ice advances. The position of the organic bed is fundamental evidence. It proves that, between episodes of glaciation, a basin held fresh water and accumulated sediment rather than lying beneath overriding ice.

The Derryvree organic material produced the conventional radiocarbon determination Birm-166, $30,500 \pm 1,100/1,030$ radiocarbon years BP. Subsequent regional Bayesian modelling has expressed this evidence at about 33.5 ± 1.2 thousand calibrated years BP. Neither formulation identifies 31,113 BCE as a

discrete moment, but the latter range overlaps its broad horizon. It provides good evidence for ice-free ground in part of north-central Ireland during a cold interval before the major late expansion of the Irish Ice Sheet.

The deposit is also unusually informative about local living conditions. Its pollen was poorly preserved, which restricts certainty, but was chiefly herbaceous. Plant macrofossils and mosses, together with invertebrate evidence, indicate a cold, open, periglacial environment. Sedges and freshwater mosses grew at wet margins; other remains have been associated with plants suited to saturated or cold ground, including bogbean, water-milfoil, mountain-avens, dwarf willow and arctic clubmoss. This was not modern bogland transported unchanged into the past, nor a wooded Irish landscape. It was a variable tundra-like mosaic of shallow water, wet hollows, low vegetation and exposed mineral ground, shaped by short growing seasons and repeated freezing and thawing.

Derryvree must not be made to stand for every part of the island. It records one protected basin, and local conditions depended on relief, drainage, proximity to ice and climatic shifts. Yet related deposits at Greenagho near Belcoo, also in Fermanagh, reinforce the larger conclusion that ice cover was episodic rather than permanently uniform. Their significance lies partly in what later happened: advancing ice buried, reworked and reshaped much of Ireland's older surface record. The survival of the Derryvree bed beneath till is therefore exceptional.

The Approach of the Ice Sheet

This was a cold stage, but 31,113 BCE should not simply be called the Last Glacial Maximum. Global studies place growth towards maximum ice extent broadly between 33,000 and 26,500 years ago, while reconstructions of the British–Irish Ice Sheet place its major build-up after about 35,000–32,000 years ago and its maximum extent later, broadly around 27,000–21,000 years ago. The exact sequence varied between sectors. Recent minimum reconstructions for around 31,000 years ago do not yet place ice over Ireland because the evidence is insufficient to define an island-wide ice cover at that moment.

Thus Ireland was a changing frontier, not a fixed white continent or a benign refuge. The Derryvree evidence shows that liquid freshwater and cold-adapted vegetation existed in Fermanagh during an ice-free interval. In the wider north-west European region, expanding ice, falling sea levels, changing coastlines and severe seasonal climates continually altered possible habitats and routes. Later shelf-edge advances demonstrate that ice ultimately extended far beyond modern Irish coasts. They do not prove that every Irish locality was simultaneously ice-covered around this particular modern BCE label.

Castlepook and the Human Question

County Cork supplies the most intriguing evidence relevant to people. Castlepook Cave, also known as Mammoth Cave, near Doneraile, was excavated principally between 1904 and 1908 under the auspices of the Royal Irish Academy's cave-exploration work. Its collections, now associated with the National Museum of Ireland, include a remarkable assortment of Late Pleistocene animal remains. Reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena demonstrate that, at different times, Ireland supported a far richer cold-stage fauna than its later island ecology might suggest.

Spotted hyaena is particularly important. Its bones, skull fragments and coprolites indicate that Castlepook was used within a carnivore landscape, perhaps as a den or place into which carcass remains were dragged. New radiocarbon work has revised the age of some southern Irish cave fauna substantially

older than earlier determinations suggested. The cave is therefore a time-averaged faunal archive, not a single occupation layer: bones may have arrived through carnivore activity, natural death, water movement, frost disturbance and the complicated history of early excavation.

One reindeer femur has made Castlepook central to Ireland's earliest human-history debate. Ruth Carden has interpreted a deep linear mark on it as damage made by a sharp stone tool during carcass processing. County Cork heritage material places the object approximately around 31,000 BCE. If that interpretation is confirmed, it would be the earliest presently claimed indication that a person handled an animal in Ireland, potentially placing a brief human visit in the broad chronological neighbourhood of this article.

Its limits are as important as its promise. The date concerns the animal bone, not an exactly known time of cutting, and the mark's identification as anthropogenic is a specialist taphonomic judgement rather than a result supplied by radiocarbon alone. No securely associated stone-tool assemblage, hearth, dwelling surface, human burial or concentration of repeatedly butchered animals of this age has been recovered from Ireland. Nor was the femur excavated under modern stratigraphic conditions. The cautious conclusion is that the bone may record the use of a sharp lithic edge on a reindeer carcass; it does not establish a settlement, a continuous population or an event in the calendar year 31,113 BCE.

Animals, Resources and Movement

The Castlepook fauna nevertheless makes the landscape more tangible. Reindeer imply open feeding grounds, while mammoth, giant deer, wolves and hyaenas point to a substantial, if fluctuating, food web. Carnivores and scavengers could accumulate bones in caves, which explains both the value and the difficulty of the evidence. A cave bone assemblage reveals that animals reached an area; it does not necessarily show that they lived there together, in the same season, or within one stable ecosystem.

If people did reach Ireland during this interval, the most defensible economic interpretation is modest: mobile hunter-gatherers may have exploited animal resources, perhaps cutting meat, hide, sinew or marrow from a reindeer. It would be unwarranted to infer a named Upper Palaeolithic group, a permanent camp or routine trade. Mainland north-west Europe certainly contained human communities with sophisticated stone technologies and extensive social networks, but that continental evidence supplies context, not proof of equivalent activity in Ireland. Low sea levels altered the geography of the Irish Sea basin, but the exact route, season and scale of any human movement to the island remain unknown.

No Politics, No Recorded Beliefs

There is no evidence from Ireland at this date for political institutions, rulers, territorial diplomacy, warfare, formal law or diplomacy. There is likewise no Irish evidence for farming, herding, pottery, monuments, writing, schools, organised exchange networks or ritual structures. These are not omissions from an otherwise detailed national record: they are questions the surviving evidence cannot answer.

Religion and culture are equally beyond secure reconstruction. A possible butchered bone does not reveal language, kinship, beliefs, artistic practice or ceremony. Nor do animal fossils license stories of heroic hunts. What can responsibly be said is narrower and, in its way, more striking. Ireland was intermittently habitable for cold-adapted plants and large mammals before later ice expansion. At Castlepook, one marked reindeer femur may preserve a fleeting human action. At Derryvree, freshwater mud, mosses and sedges preserve the environmental setting more securely than any imagined episode.

What This Date Can Mean

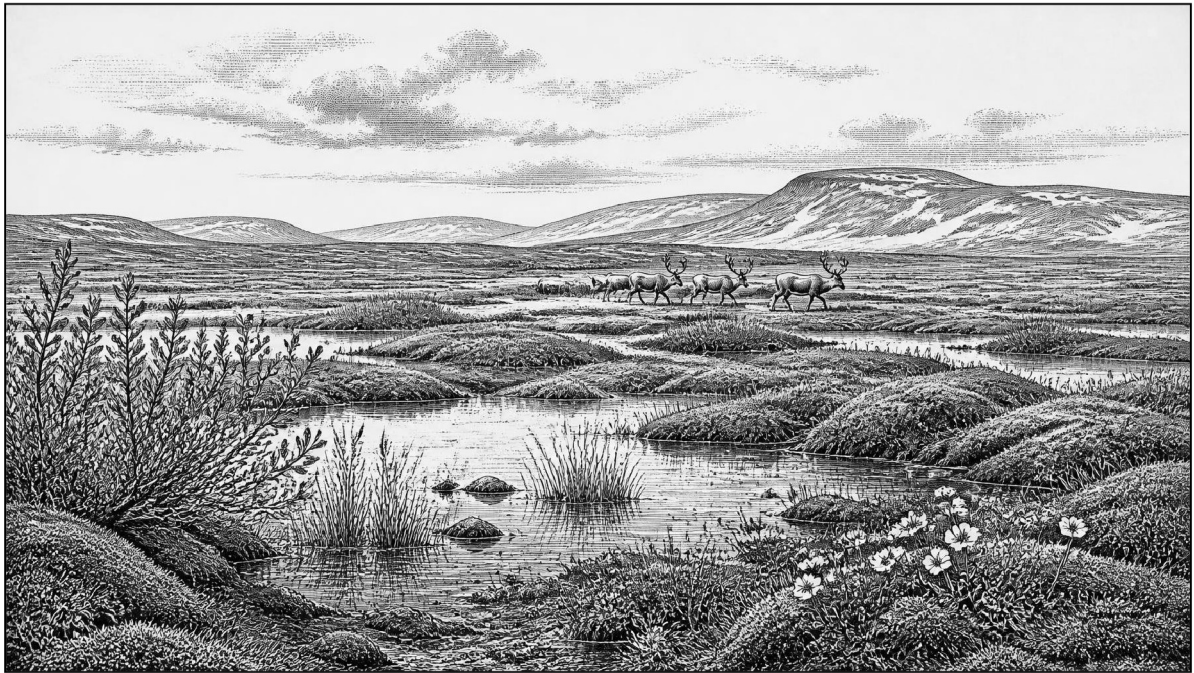
The history of Ireland around 31,113 BCE is therefore a history of evidence rather than of recorded events. The directly observed facts are buried freshwater sediments in Fermanagh, fossils of cold-stage organisms, cave fauna in Cork and an unusually provocative mark on a reindeer bone. The broader reconstruction—open tundra-like ground, intermittent ice-free terrain, animal movement and the possible arrival of mobile hunters—is interpretation, supported to differing degrees by those facts and by regional comparison.

The main development was environmental instability on the eve of much more extensive glaciation. Derryvree preserves an ice-free wetland interval before a later ice advance; Castlepook preserves evidence that Ireland's Pleistocene fauna included animals now unimaginable in the modern countryside. The questioned cut on a reindeer femur holds out the possibility that people briefly entered that world. It remains a question worth investigating, not a licence to invent Ireland's first settlers, their politics or their calendar.

Chapter 089 of 100

31112 BCE

The BIRM-166 Drumlin Cut^[89]



“31,112 BCE” is a modern calendrical label, not a date that people in Ice Age Ireland could have recognised or that archaeology can isolate to a single year. No written record, settlement surface or securely dated human object permits an annual narrative. The responsible approach is to place this point within the later part of Marine Isotope Stage 3, during the Last Glacial Period, and to use broad calibrated ranges rather than false precision. In radiocarbon terms, 31,112 BCE corresponds roughly to 33,000 calendar years before AD 1950, but the evidence nearest to that horizon has uncertainties measured in centuries or millennia.

The most informative Irish archive is not a village, grave or monument but a buried freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed silts and fine sands trapped between two tills: sediments left by ice on separate occasions. The intervening organic layer produced the conventional radiocarbon determination BIRM-166, 30,500 radiocarbon years before present, with a substantial uncertainty. Published calibrations have placed it broadly around 36,900–31,700 calendar years before present. That range includes the modern label 31,112 BCE only approximately; it does not establish conditions on a particular day, season or year.

A Wetland Between Ice Advances

Derryvree matters because it demonstrates that this part of Ireland was ice-free for an interval between glacial episodes. Its freshwater sediments preserve pollen, plant macrofossils, mosses and insect remains. The evidence points to a cold, treeless, periglacial landscape: ground repeatedly frozen and thawed, with wet hollows and shallow water amid open vegetation. Mosses, sedges and herbs were important components. Finds including bogbean, water-milfoil, mountain-avens, dwarf willow and alpine

clubmoss indicate that the ground was not a uniform desert of snow and stone. Rather, moisture, soil depth, exposure and season created a patchwork of ponds, marshy margins, sparsely vegetated ground and more sheltered niches.

This was not a precursor of the familiar green island. There is no good basis for imagining oak woods, enclosed fields, peat-cutting or a settled rural landscape. Sparse pollen of trees such as pine or hazel is not proof of local woodland: pollen can travel long distances, while preservation in the deposit was poor. The stronger conclusion is negative but valuable. South Fermanagh was largely open, cold and without forest at the time represented by the layer. Summer growth could nevertheless have been intense in sheltered wet places under long daylight, while winter brought severe cold, frost action and a radically restricted food supply.

The deposit also offers a lesson in scale. A wetland beneath one Fermanagh drumlin is an unusually rich local archive, not a map of the entire island. Conditions may have differed sharply between lowlands, mountain districts, the Atlantic-facing west and the south-east. The broad sea floor was exposed far beyond today's coast during colder phases because global sea level was lower, changing shorelines and potential movement routes. Yet exposed land did not automatically make travel easy: ice fronts, icy rivers, boggy ground, storms and the Irish Sea basin could all form formidable barriers.

Before the Greatest Ice Extent

Around this broad period, Ireland was entering a phase of major climatic instability and ice-sheet growth. It would be misleading, however, to place the whole island beneath its maximum ice cover in 31,112 BCE. Large-scale reconstructions of the British–Irish Ice Sheet show that its fullest late-glacial extent and rapid reorganisation belonged mainly to later millennia, especially after about 26,000 calendar years ago. Evidence from Derryvree, as well as other pre-Last Glacial Maximum records, instead preserves an earlier window when at least some Irish terrain remained exposed.

The sequence at Derryvree is especially eloquent because the freshwater bed lies between tills. It records an ice-free interval, while the overlying till makes plain that ice later returned and sealed the evidence beneath the drumlin. That later advance both destroyed much of the older landscape and, paradoxically, protected this small remnant of it. Ireland's sparse record from this era is therefore not evidence that nothing happened. It is partly the result of glaciers eroding, transporting and redepositing sediments, and of later rivers, soils and coasts further remodelling what survived.

Regional change was the dominant historical force. Ice, meltwater and frost shaped routes, habitats and the availability of food more decisively than any human institution could have done. There can be no responsible discussion of Irish political affairs, diplomacy or territorial rule at this date: there are no named communities, leaders, boundaries or social groups in the evidence. Nor is there evidence for warfare. The closest equivalent to a shifting frontier was environmental: the advance and retreat of ice, and the changing limits of land capable of sustaining plants, animals and perhaps brief human visits.

Animals in a Changing Island

Caves in southern Ireland, particularly Castlepook Cave near Doneraile in County Cork, supply a different kind of evidence. Their bone assemblages show that Ireland supported, at various times during Marine Isotope Stage 3, a cold-climate mammal community that included reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. These animals should not be assembled into a single imagined herd grazing together in 31,112 BCE. Cave deposits were

often accumulated over long periods, disturbed by carnivores, water and early excavation, and individual bones can have very different ages. Recent re-dating has reinforced the need to assess each specimen and its context rather than treating an old collection as one moment in time.

Nonetheless, the fauna establishes an important possibility: parts of Ireland could sustain substantial animals in a cold open environment before the Last Glacial Maximum. Reindeer are particularly suited to the image of mobile grazing across open country; wolves and spotted hyaenas imply carnivore-scavenger relationships; lemmings and Arctic fox indicate cold-adapted habitats. Mammoth and giant deer remains reveal the wider ecological potential of the island, but they do not tell us how numerous those animals were locally, nor whether they occupied County Fermanagh and County Cork simultaneously.

Caves were not necessarily homes for people. At Castlepook, the evidence strongly suggests that carnivores played a major role in bringing bones underground. A cave bone assemblage can record dens, scavenging, natural deaths, water movement and excavation history as much as deliberate human activity. It is therefore more reliable for reconstructing a broad faunal world than for locating a campsite or tracing a seasonal route.

The Human Question

The possibility of people in Ireland around this horizon turns on a small but consequential item: a reindeer femur from Castlepook bearing a mark interpreted by some researchers as having been made with a sharp stone tool while fresh bone was being processed. County Cork's heritage presentation assigns the bone broadly to about 31,000 BC and treats the mark as evidence of Palaeolithic butchery. If that interpretation, dating and association are upheld by continuing analysis, it would indicate a human presence or visit far earlier than Ireland's better-established terminal Pleistocene evidence.

But it must remain a carefully framed possibility, not a populated national origin story. No securely associated stone-tool assemblage, hearth, dwelling, burial, repeated occupation layer or human skeletal remain has yet been demonstrated for Ireland at this age. The bone itself dates the animal, not the exact moment at which the surface was marked. Its cave context was disturbed, and the island's Pleistocene deposits are notoriously difficult to interpret. The National Museum of Ireland has long stressed the absence of clear Palaeolithic human evidence; the Castlepook specimen is an important challenge to that older position, not a reason to claim certainty where the archaeological record remains thin.

If people did reach Ireland during this interval, the evidence supports only a modest inference: small, mobile groups familiar with northern Europe's cold environments may have intermittently crossed into a landscape where reindeer and other large animals could be exploited. Carcass processing would have supplied meat, fat, hide, sinew, bone and antler. That is an inference from Upper Palaeolithic lifeways elsewhere and the possible cut-marked bone, not direct evidence for an Irish camp, household or hunting strategy. It cannot establish population size, language, kinship, gender roles or permanent residence.

What Cannot Yet Be Seen

Economy, exchange and culture must consequently be treated with restraint. There is no evidence of farming, metalwork, pottery, seafaring trade, mining or long-distance exchange networks within Ireland at this date. No known Irish artefact assemblage reveals toolmaking traditions, and no rock art, portable art, musical instrument or ritual site can responsibly be assigned to 31,112 BCE. Religion and learning are

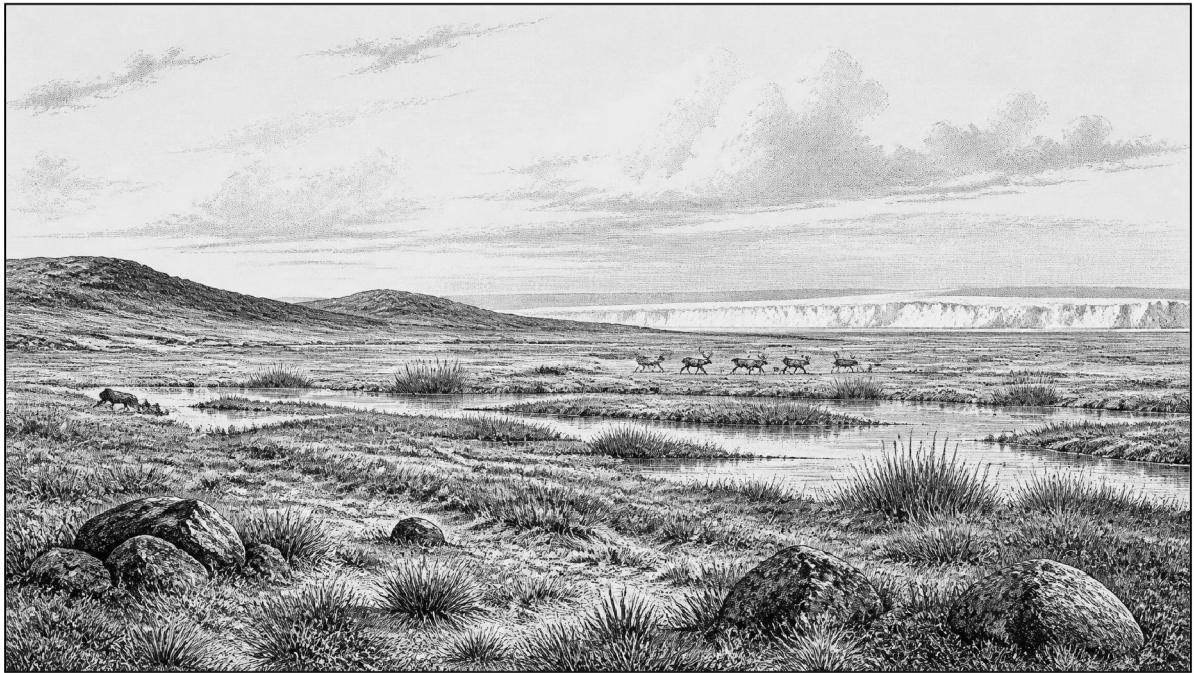
likewise beyond recovery. A person using a stone edge to process an animal, if that occurred, possessed practical knowledge of materials, animal bodies and a demanding climate; beyond that, the record is silent.

Yet the silence is not emptiness. Derryvree's silt, mosses and insect remains show a living wetland under harsh conditions. Castlepook's bones show that large mammals and predators entered Ireland during the wider period. The strata above and below them reveal an island repeatedly reorganised by ice. For Ireland at this remote point, the most meaningful history is therefore environmental and evidential: an open, cold land; local freshwater refuges; animal movement across changing terrain; and a tantalising but unconfirmed prospect that human hunters briefly shared that world before later ice obscured almost all trace of them.

Chapter 090 of 100

31111 BCE

Castlepook's Reindeer Window^[90]



“31,111 BCE” is a modern chronological label, not a date at which Ireland can be described year by year. No calendar, writing, named community or securely datable event survives from this depth of time. Archaeology cannot identify what happened on one particular day, season or even year. The responsible approach is to place the notional date within a wider calibrated interval: roughly 33,000 calibrated years before present, or about 31,000 BCE, in the later part of Marine Isotope Stage 3, a cold and highly variable phase of the last Ice Age. The evidence is sparse, uneven and often revised as dating methods improve.

A Cold, Changing Island

Ireland then occupied the north-western edge of Europe, exposed to abrupt climatic swings in the North Atlantic world. It was not yet at the climatic peak conventionally called the Last Glacial Maximum. Major reconstructions place the maximum expansion of the British–Irish Ice Sheet later, broadly between about 27,000 and 23,000 calibrated years before present. At the approximate horizon represented by 31,111 BCE, however, ice was already an increasingly powerful force in the Irish landscape. Its margins, thickness and timing differed between regions and changed over centuries and millennia; a single map of the island for one supposed year would imply more precision than the evidence allows.

Sea level was far below its modern position because vast quantities of water were stored in continental ice sheets. Ireland’s coastlines therefore lay beyond today’s shore in many places, and the Irish Sea basin was a changing geographical zone rather than the fixed maritime barrier familiar today. Lower sea level did not automatically create a straightforward, continuous land bridge to Britain or continental

Europe. Ice, changing channels, exposed shelf, rivers, wetlands and local relief all mattered. The practical routes available to animals, and perhaps to people, remain a matter of reconstruction rather than direct observation.

The climate supported open, largely treeless landscapes in many areas. Evidence from Irish fossil deposits points towards a mosaic of grassland, herb-rich tundra, wet ground, dwarf shrubs and scattered cold-tolerant vegetation rather than a uniform white wilderness. In County Fermanagh, organic silts trapped between glacial tills at Derryvree and nearby Maguiresbridge preserve a valuable environmental archive. Plant macrofossils and pollen from such deposits include sedges, mosses, bogbean, water-milfoil, dwarf willow, mountain-avens and other plants suited to open, cold, moist conditions. These remains do not provide a photograph of all Ireland at 31,111 BCE, but they show that ice-free intervals could sustain freshwater pools and varied tundra-like plant communities.

What the Caves Preserve

The clearest Irish evidence for this broad period comes not from villages or tools, but from animal bones, especially those protected within limestone caves. Castlepook Cave near Doneraile in north County Cork—long known as Mammoth Cave—has exceptional importance because it contains both pre- and post-Last Glacial Maximum deposits. Early twentieth-century excavations recovered a mixed assemblage accumulated through several processes: animals dying or sheltering in caves, predators carrying prey inside, carnivore denning, water movement and later disturbance. A cave bone collection is therefore not a simple census of animals living together at one moment.

Even so, re-dating has transformed the significance of Castlepook and comparable southern Irish sites. Improved collagen preparation and ultrafiltration have shown that some older radiocarbon determinations substantially underestimated the age of bones. The revised evidence places elements of the southern Irish fauna within Marine Isotope Stage 3, before the Last Glacial Maximum. Reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox and spotted hyaena all figure in the wider Irish Pleistocene record, though not every species can be assigned to precisely the same century, landscape or ecological community. Their presence demonstrates that Ireland was not biologically empty during portions of this long cold phase.

Reindeer are particularly evocative. Their occurrence implies open country with extensive grazing and browsing opportunities, while mammoth and giant deer indicate habitats capable of sustaining very large herbivores. Spotted hyaena remains are equally important: they reveal a large predator and scavenger operating within a food web that included substantial carcasses. Such animals were not curiosities at the edge of a modern Irish landscape. They belonged to a Pleistocene ecology very different from the island's later wooded Holocene environment. Yet the evidence is chronological and geographical patchwork, not proof that a mammoth, hyaena and reindeer herd stood together near Castlepook in the particular year represented by this article.

The Human Question

Human presence is the most delicate issue. Ireland has no securely excavated camp, hearth, stone-tool assemblage, dwelling, burial or occupation surface dated to around 31,111 BCE. There is consequently no sound basis for describing a settled population, estimating numbers, naming a culture or imagining an

established hunting territory. The National Museum of Ireland has rightly long stressed the absence of clear Palaeolithic evidence for human occupation; this remains an essential caution against turning a small body of faunal material into a full social history.

At Castlepook, however, a reindeer femur has been reported as bearing a deep mark consistent with modification by a sharp stone tool. The bone has been associated in public discussion with an age of roughly 33,000 years. If the mark is confirmed as a cut made during carcass processing, it would be striking evidence that a person handled a reindeer in Ireland during the Upper Palaeolithic. It would not, by itself, demonstrate that people hunted the animal, lived beside the cave, arrived in a large group, or returned regularly. The radiocarbon result dates the animal bone within a calibrated range, rather than recording the exact moment of any cut.

The proper conclusion is therefore modest but important. Brief human visits are possible, and the Castlepook bone gives that possibility a serious archaeological basis. The find invites fresh searches of caves, river deposits and now-submerged landscapes. It does not erase the gulf between an isolated indication of animal processing and the later, unmistakable record of settlement. The best-established evidence for people in Ireland comes far later, while the well-known Mesolithic site of Mount Sandel in County Londonderry belongs to a post-glacial world many millennia after this horizon.

No Politics, No Recorded Conflict

There is no evidence for political institutions, rulers, territories, diplomacy, warfare or organised religion in Ireland at this date. Nor can archaeologists responsibly infer them from climate or animal bones. A possible encounter between a small human party and a reindeer carcass would speak only to a practical act of subsistence: the recovery of meat, hide, marrow, sinew or bone. It could suggest knowledge of cutting tools and animal anatomy, but it cannot reveal language, kinship, leadership, ceremonial practice or beliefs.

Nor is there evidence for a local economy in the later historical sense. There were no farms, crops, domestic livestock, markets, metalwork or built settlements. If people did reach the island intermittently, they would have been mobile hunter-gatherers operating in a demanding environment and connected, at most, to wider Upper Palaeolithic worlds beyond Ireland. The existence of sophisticated stone technologies, tailored clothing, hunting knowledge and art elsewhere in Europe at broadly comparable dates should not be projected automatically onto Ireland. No Irish artefact assemblage currently demonstrates those practices here.

Environmental Change as History

For this remote interval, environmental history is the principal history. Ice advance later removed or disturbed many surface deposits, which helps explain why Ireland's record is so fragmentary. Cave archives, buried wetland sediments and glacial stratigraphy survive precisely because they were sheltered, sealed or deeply buried. They are powerful evidence, but each comes with limits. Fossil pollen and plant remains indicate vegetation and water conditions near a deposit; animal bones identify species, not necessarily the full landscape or a single contemporaneous community; ice-sheet landforms chart movement, but often cannot be dated to a particular century.

The period around 31,111 BCE should thus be understood as an interval of ecological opportunity under mounting climatic pressure. In southern Ireland, large grazing animals and carnivores ranged across an open cold-country mosaic during at least parts of Marine Isotope Stage 3. In the north, wetland

sediments show that freshwater habitats and specialised vegetation persisted in some ice-free settings. Across the island, advancing ice, altered drainage and changing sea levels were reshaping the conditions under which animals—and perhaps occasional people—could move.

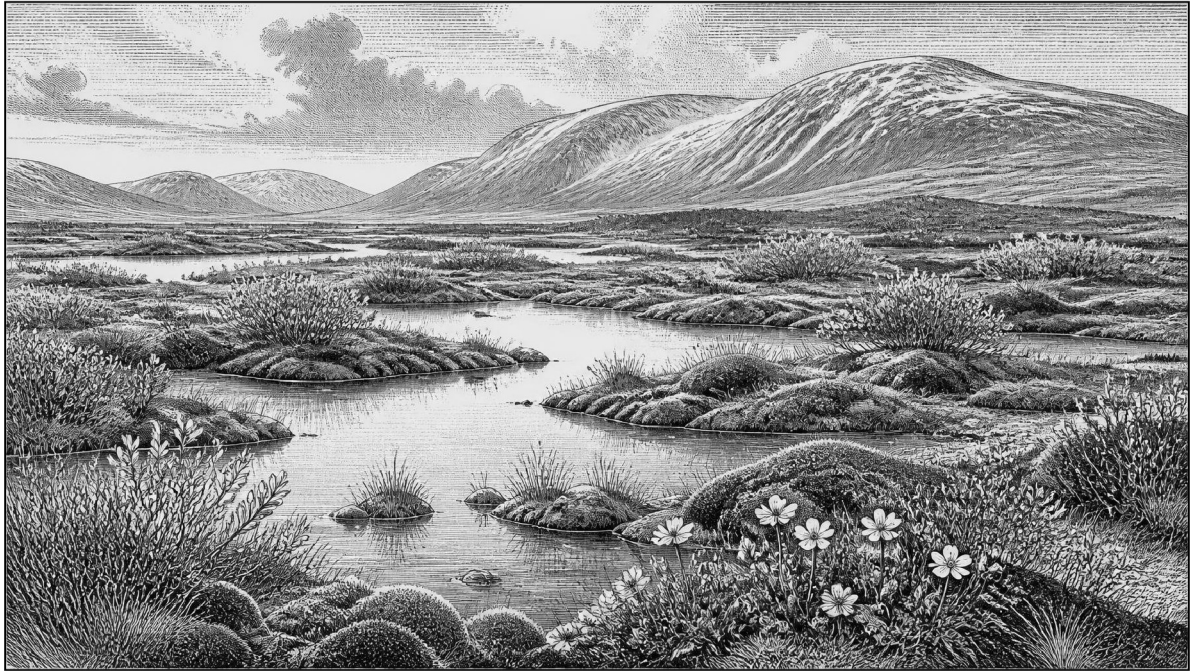
A Window, Not a Chronicle

Castlepook offers a narrow but remarkable window onto this vanished Ireland. Its bones preserve evidence of animals that disappeared before the later full-glacial ice advance, and its possible reindeer cutmark raises a consequential question about the antiquity of human contact with the island. The decisive fact is not a fabricated event in “31,111 BCE”, but the coexistence of uncertainty and discovery. Ireland’s earliest deep past is not empty: it is preserved in fragments, dated in ranges, and continually open to reassessment as old collections are re-examined with new methods.

Chapter 091 of 100

31110 BCE

BIRM-166's Mossy Pools^[91]



The modern label 31,110 BCE cannot be treated as a date in the ordinary historical sense. Ireland had no writing, calendar, named rulers or recoverable annual sequence at this depth of time. In archaeological terms, the point falls roughly 33,060 calendar years before AD 1950, in the later part of the Last Glacial Period and Marine Isotope Stage 3 (MIS 3). It is therefore better understood through broad, calibrated ranges than through a supposed event of a single year. The closest and most informative Irish evidence is an environmental deposit at Derryvree near Maguiresbridge, County Fermanagh, whose calibrated range of about 36,900–31,700 years before AD 1950 encompasses this notional date.

A Date Within a Long Interval

Derryvree was revealed in 1969 when roadworks cut through a drumlin, one of the streamlined hills shaped by glacier ice. The exposed sequence contained freshwater silts, fine sands and organic sediments trapped between two separate beds of till: unsorted debris deposited by ice. This stratigraphy is the fundamental evidence. It demonstrates that glacial conditions affected the locality, that an intervening period allowed a freshwater environment to form, and that a later advance of ice buried and preserved its deposits. It does not identify the exact year in which a particular plant grew, an insect died or water stood in a pool.

The organic material produced radiocarbon determination BIRM-166, conventionally reported as 30,500 radiocarbon years before present, with a substantial uncertainty. Radiocarbon years are not calendar years. Atmospheric carbon-14 has changed over time, so old results must be calibrated against internationally maintained curves. At around 30,000 radiocarbon years ago, the conversion yields wide

probability ranges rather than a precise calendar point. The named year can responsibly be placed inside Derryvree's broader chronological horizon; it cannot be assigned to the beginning, middle or end of that deposit, still less to a human action.

Freshwater Beneath the Drumlin

What Derryvree does preserve is an exceptional glimpse of a cold Irish habitat. Its pollen, plant macrofossils, mosses and insects indicate open, treeless vegetation in a periglacial climate: ground subject to long winters, frost and short growing seasons, but not permanently sealed beneath ice. Sedges, grasses and herbs were important. Fossils of plants including mountain avens, dwarf willow and bogbean point to a mixture of exposed ground, wet margins and shallow freshwater. Mosses and insect remains indicate pools with abundant plant material around their edges. Older descriptions call such ground "muskeg"; the useful modern point is that it was a saturated, mossy and locally ponded tundra landscape rather than woodland or blanket bog as later Ireland would know it.

These remains are observations, whereas the broader landscape reconstruction is interpretation. The deposit shows that suitable wetland habitats existed at Derryvree. It does not prove that every valley in Ireland was similarly wet, that the entire island was uniformly treeless, or that modern Arctic conditions can be simply transplanted into the past. A few grains of tree pollen, for example, need not signify a nearby forest, because pollen can travel far. The combined evidence nevertheless makes nearby woodland improbable: the dominant signal is of sparse, low vegetation adapted to cold and open country.

An Uneven, Changing Ireland

Ireland around this time was not yet at the Last Glacial Maximum, the later period when the British-Irish Ice Sheet attained its greatest volume. Recent reconstructions identify substantial ice growth from about 31,000 years ago, but its timing, thickness and extent varied between regions. Modelled reconstructions suggest ice caps and glaciers on Irish uplands while other areas retained ice-free terrain. This makes a single national weather report impossible. Derryvree records one inland Fermanagh setting; uplands, western coasts, lowlands and the Irish Sea basin could have differed greatly in exposure, snow cover, drainage and proximity to ice.

Sea level was far lower than it is now, altering coastlines and the geography of the Irish Sea. Yet the available evidence does not securely establish the precise route by which each animal, or any person, reached Ireland at this particular time. It is reasonable to see Ireland as part of a wider north-west European ecological zone, not as an isolated modern island, but it would be unsafe to draw a specific land bridge, shoreline or migration corridor for 31,110 BCE. Repeated glacial erosion and later rising seas have removed or submerged much of the relevant evidence.

The Cave Record at Castlepook

In north County Cork, Castlepook Cave near Doneraile provides a very different archive. Its limestone passages yielded one of Ireland's richest assemblages of Pleistocene animal remains, including woolly mammoth, giant deer, reindeer, brown bear and spotted hyena, as well as cold-adapted smaller mammals. The cave is crucial evidence that Ireland supported, or was visited by, a much broader Ice Age fauna than the later island. It also conveys ecological tension: a cave could be a carnivore den, a trap, a place into which water carried material, or a repository of bones accumulated over long spans.

That qualification is essential. Castlepook's early excavations and disturbed deposits mean that its finds must not be imagined as one contemporaneous herd assembled in 31,110 BCE. Improved radiocarbon methods have shown that several older Irish cave dates need revision, and the faunal collection represents episodes across the late Pleistocene. Its value is regional and chronological, demonstrating a changing cold-stage world before the maximum ice advance, rather than supplying a scene from one day or even one century.

The Human Question

A reindeer femur from Castlepook has attracted particular attention because a mark on it has been interpreted as damage made by a sharp stone tool while the bone was fresh. If that interpretation is sustained, it may signal that people butchered a reindeer in Ireland roughly 33,000 years ago. Such a finding would greatly extend the potential human story of the island. But it is not yet evidence for a settled population, a camp at Castlepook, or a community present in the year considered here. No securely associated stone-tool assemblage, hearth, dwelling, burial or repeated occupation surface has yet demonstrated an Irish Upper Palaeolithic settlement of this age.

Consequently, political affairs, diplomacy and warfare cannot be reconstructed. There are no named groups, territories, leaders or institutions. Nor is there evidence for trade in the usual archaeological sense: no confirmed exchange network, imported artefact or permanent settlement belongs securely to this horizon. If occasional hunter-gatherers did reach Ireland, their movements would have depended upon seasonal knowledge, social ties beyond the island and the hazards of a cold landscape; that is a plausible inference from the wider European Upper Palaeolithic, not an established fact about Derryvree or Castlepook.

Life, Belief and Absence

The evidence supports no claim about language, religious rites, art, learning or kinship systems in Ireland at this date. Nor can it demonstrate houses, clothing, boats or hunting methods. The strongest story is environmental: freshwater persisted in sheltered places; small plants and insects occupied wet ground; larger animals ranged through some Irish landscapes; and advancing ice was beginning to narrow the conditions under which such communities could survive. Any people who may have entered this world left, so far, only a disputed and isolated trace.

That apparent silence is historically meaningful. Later ice sheets scoured bedrock, reworked older sediments and buried or destroyed exposed sites. The survival of a thin organic layer beneath a Fermanagh drumlin and bone collections in a Cork cave is therefore remarkable. Around 31,110 BCE, Ireland's recoverable past is not a chronicle of rulers or battles. It is a fragile archive of cold water, moss, sedge, animal bone and moving ice: evidence sufficient to show a living, changing landscape, but not sufficient to invent a year-by-year human history for it.

Chapter 092 of 100

31109 BCE

Maguirebridge and Mammoth Cave^[92]



A Modern Year Without a Contemporary Calendar

Modern calendar-year precision is not available for Ireland in 31,109 BCE. No written record, named community, ruler, settlement sequence or event can be assigned to that single year. The number is a modern conversion, approximately 33,058 years before AD 1950, the conventional reference point used for radiocarbon chronology. At this depth in time, even well-dated evidence belongs to ranges of centuries or millennia, not to a particular season or day.

The responsible setting is the Late Pleistocene, during Marine Isotope Stage 3: a long, unstable cold phase before the greatest expansion of the last British–Irish Ice Sheet. Ireland was not yet necessarily the wholly ice-covered landscape often imagined for the Last Glacial Maximum. The fullest ice expansion came later, broadly after c. 26,000 years ago. Around the modern label 31,109 BCE, the island's environments were changing sharply, and the surviving evidence is fragmentary because later ice repeatedly eroded, buried and rearranged older deposits.

Two very different archives give Ireland's best evidence for this broad interval. One is a freshwater deposit found beneath a drumlin at Derryvree, near Maguiresbridge in County Fermanagh. The other is the animal-bone assemblage from Castlepook Cave, or Mammoth Cave, near Doneraile in County Cork. Neither is a historical chronicle. Together, however, they reveal an island of cold open habitats, intermittent water, mobile animals and perhaps exceptionally fleeting human visits.

Fermanagh Between Ice Advances

Derryvree was exposed in road works in 1969. Excavators found organic-rich freshwater silts and fine sands trapped between two separate sheets of glacial till. The position of the deposit is crucial: it proves that, at least locally, freshwater sediment accumulated after one ice advance and before another later advance buried the evidence. It is not proof that every part of Ireland was ice-free at the same moment, nor that the site preserves a continuous record of the island.

A conventional radiocarbon determination from the deposit was 30,500 radiocarbon years BP, with a substantial uncertainty. Later syntheses have placed its broad calibrated age approximately within c. 36,900–31,700 cal BP, although the exact calendar expression depends on calibration and treatment of the measurement. The modern date 31,109 BCE lies near this wide chronological horizon, but cannot be fixed to a particular sediment layer. The correct conclusion is therefore modest: Derryvree illuminates conditions in northern Ireland around this part of the late glacial cycle, rather than documenting conditions in one numbered year.

The silts contained pollen, plant macrofossils, mosses and insects. Their combined evidence indicates a largely treeless, cold landscape with grasses, sedges, herbs, juniper and low-growing plants, alongside wet ground and shallow freshwater pools. Bogbean, water-milfoil and aquatic mosses point to local standing or slow-moving water. Insects reinforce the picture of a mossy, plant-rich wetland rather than a barren polar desert. Winters were probably severe, while short growing seasons allowed wetland plants to exploit sheltered waterlogged ground.

This was a mosaic, not a uniform tundra plain. Around the pools may have stood sedge marsh, damp mossy ground, exposed mineral soil and patches of dwarf shrub. Such places could offer water and forage to animals even when the wider terrain was sparse. Yet the evidence records ecology, not human settlement: there are no houses, hearths, tools, fields or graves at Derryvree.

Cork's Cave Fauna

Castlepook Cave provides a contrasting southern record. Its old excavations recovered bones of woolly mammoth, reindeer, spotted hyaena, brown bear, wolf, Arctic fox, hare, stoat and lemmings. The collection was accumulated through more than one episode and not all specimens have secure modern excavation contexts. It must not be treated as a single living animal community photographed at one instant. Nevertheless, radiocarbon dates on mammoth and spotted-hyaena material, broadly around 35,000–34,000 radiocarbon years BP in older reporting, place important elements of the assemblage in the same general pre-maximum cold-world interval.

The fauna supports the environmental reconstruction from Fermanagh. Reindeer, lemmings and Arctic fox are animals of open, cold country; mammoth implies extensive grazing land rather than closed forest. Spotted hyaenas are especially revealing. They were formidable scavengers and hunters, and caves could act as refuges, dens or places where bones accumulated after carnivores had fed. A cave bone collection consequently records animal behaviour, chance preservation and the history of excavation as much as it records the landscape outside.

There is no basis for describing this as a settled Cork society. Mammoths and hyaenas did not share the landscape with towns, farms or territorial polities. But the animals demonstrate that Ireland could support substantial cold-adapted fauna during parts of this period. Their presence also indicates connections with the wider north-west European land-and-sea landscape, whose coastlines and routes were very different when global sea level was lower.

A Possible Human Trace

Castlepook has become important to Irish prehistory because a reindeer femur fragment was re-examined and reported in 2021 as bearing deep marks interpreted as having been made by a sharp stone tool during carcass processing. Accelerator radiocarbon dating reportedly placed the bone at about 33,000 years ago. If that interpretation is sustained by further analysis, it would be Ireland's earliest known indication of human activity by a very large margin.

That finding must be expressed with care. A marked bone is not a camp, a tool kit or proof of a permanent population. The old cave collection has limited stratigraphic context, and the surviving evidence does not identify who made the mark, how long they remained, how many people were present, or whether they returned. Nor can a broad date for the bone be converted into an event at 31,109 BCE. The most that can responsibly be suggested is that people may have entered or reached Ireland during this wider interval and processed a reindeer carcass with a stone edge.

If humans were present, their way of life would have been that of highly mobile Upper Palaeolithic hunter-gatherers, relying on detailed knowledge of animals, weather, raw materials and routes across a shifting north-west European world. Reindeer could provide meat, marrow, hide, sinew, antler and bone; but those useful possibilities are general inference, not demonstrated products from this particular bone. No securely associated Irish hearth, dwelling, artwork, burial or lithic assemblage has yet been recovered for this horizon.

What Cannot Be Reconstructed

Political affairs, diplomacy, laws, named leaders and warfare cannot be recovered for Ireland at this date. There is likewise no evidence for organised religion, formal monuments, agriculture, long-distance commerce or an Irish language. It would be misleading to fill these absences with imagined clans, chieftains or rituals. The archaeological record is too slight even to show a continuing human population.

Conflict can be discussed only in an ecological sense. Carnivores and people, if people were present, may have sought the same animal resources, but there is no evidence for violence between human groups. Economy is visible only indirectly in the seasonal productivity of wetlands and in the possible processing of one reindeer bone. Culture and learning are inferred at the broadest level from the skill required to survive a cold, mobile hunting landscape, not from any specifically Irish artwork or tradition.

Approaching the Ice Maximum

The larger development was climatic and geographical. Ireland lay within a period of abrupt northern-hemisphere climate oscillations, when relatively milder interstadial conditions could be interrupted by renewed cold. Speleothems at Crag Cave in County Kerry show that liquid water periodically moved through southern Irish caves during Marine Isotope Stage 3, independently confirming that conditions were not simply one uninterrupted freeze.

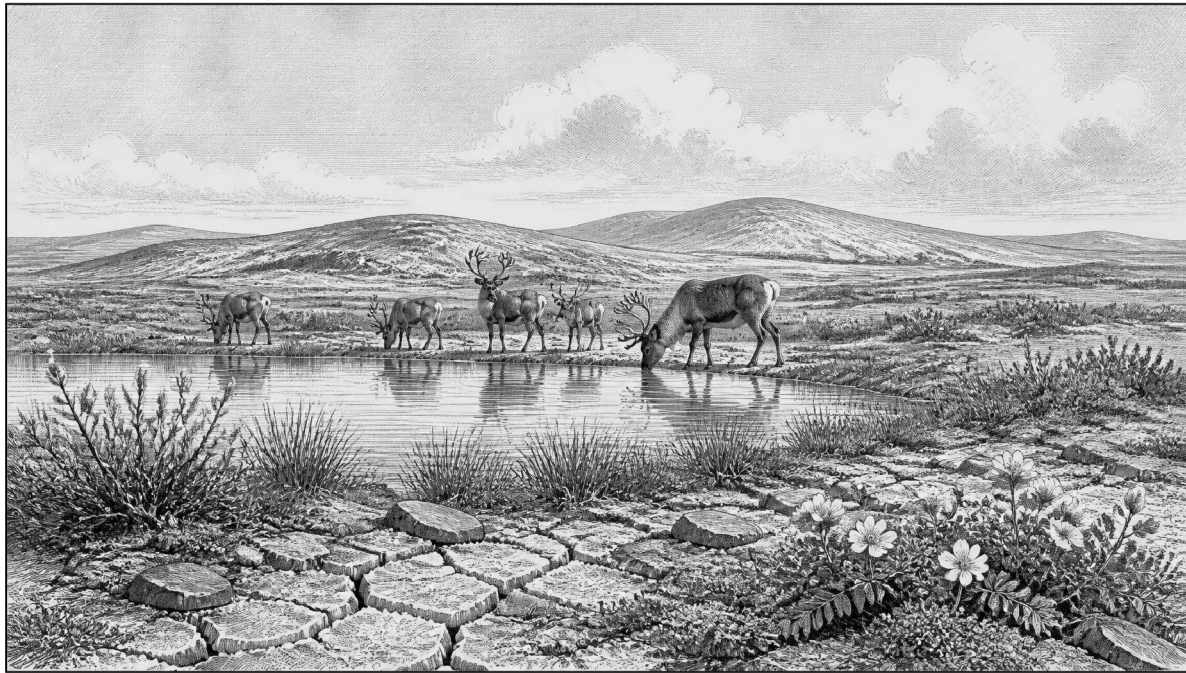
Yet cooling was gathering force. Evidence from Derryvree, Greenagho and other inter-till deposits shows that major lowland ice was not continuously present through the whole preceding interval. Subsequent expansion of the Irish and British–Irish ice sheets would transform the island, overrun or remove many older land surfaces and help explain why evidence for human activity is so scarce. Around

31,109 BCE, Ireland's history is therefore best told not as a year of kings or battles, but as a precarious interval of open country, wetland refuges, Ice Age animals and an unresolved possibility of human passage before the deep freeze intensified.

Chapter 093 of 100

31108 BCE

Maguirebridge's Clubmoss Waters^[93]



31,108 BCE cannot be treated as a recoverable year in Ireland's history. No written record, annual calendar, settlement sequence or event horizon permits that degree of precision. Used as a modern chronological label, it falls roughly 33,100 calendar years before present (where "present" in radiocarbon practice is AD 1950), during the Late Pleistocene and before the Last Glacial Maximum. The responsible history of this point in time is therefore one of dated ranges, sediments, fossils and cautious comparison—not named communities or date-specific happenings.

A Date Within Ranges

The most useful Irish chronological anchor is the freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed organic silts and fine sands lying between two separate sheets of glacial till. The arrangement matters: ice had formed the lower till, a period of open freshwater and vegetation followed, and a later advance laid down the upper till. Organic material from the intervening beds yielded a conventional radiocarbon determination of 30,500 +1,170/-1,030 radiocarbon years BP. Later calibration places its broad probability range at approximately 36,900–31,700 calendar years BP.

That calibrated interval includes the approximate position represented by 31,108 BCE. It does not mean that the Derryvree pond existed on that exact day, nor that every plant and insect recorded there lived together in a single season. Radiocarbon dates have uncertainties; calibration converts radiocarbon years into calendar-age probabilities rather than exact BCE anniversaries. The Derryvree sequence is nevertheless unusually valuable because it provides securely contextualised evidence that north-central Ireland contained ice-free ground during a cold stage before the main growth of the last Irish Ice Sheet.

Fresh Water Between the Ice Sheets

Derryvree was not a woodland lake beside a human village. Its organic sediments contained freshwater mosses and sedges, while plant and insect evidence indicated cold, northern conditions. The original investigators described an open tundra vegetation and a periglacial climate: a landscape repeatedly shaped by freezing and thawing, with little or no tree cover. Such a setting may have included shallow pools, wet sedge-rich margins, low herbaceous vegetation and exposed mineral ground. Plants such as mountain-avens, dwarf willow, clubmosses and aquatic species are part of the wider fossil picture recovered from the deposit; they indicate that even severe landscapes contained distinct wet and dry habitats.

This was an environment of short growing seasons rather than lifelessness. Meltwater, groundwater and local drainage could sustain marshy pockets among otherwise open terrain. Insects are particularly informative because their ecological tolerances help reconstruct summer warmth, winter severity and the character of local vegetation. Yet the evidence is local. It supports a cold freshwater mosaic at Derryvree, not a uniform reconstruction of every valley in Ireland. Hills, coastlands, limestone basins and uplands would have responded differently to snow cover, wind, drainage and the advancing or retreating margins of ice.

An Island Not Yet Engulfed

The broader geological evidence confirms that Ireland's last glaciation did not arrive everywhere at once. Comparable Middle Midlandian deposits at Hollymount and Greenagho in Fermanagh record cold but non-glacial intervals. A synthesis of dated deposits concludes that north-central Ireland was ice-free until at least about 34,000 years ago, before the major expansion of the last Irish Ice Sheet. In the west, dated marine evidence from Donegal Bay also indicates open water through much of the preceding period. Around the chronological point represented by 31,108 BCE, Ireland was therefore in a volatile interval: cold, open and increasingly vulnerable to renewed glaciation, but not simply an island buried beneath a single uninterrupted ice mass.

The important regional change lay ahead. Research on the last British–Irish Ice Sheet indicates a long build-up from roughly 34,000 years ago, with major expansion continuing towards the global Last Glacial Maximum, conventionally placed around 26,000–19,000 years ago. Evidence from southern Ireland shows that inland ice did not cross the south coast until after about 24,000 calendar years BP. These are continent-scale processes and long spans of time, not a prediction that an ice front moved across a particular Irish district in 31,108 BCE. They do explain why Derryvree's organic bed was eventually sealed beneath later till.

Animals of the Open Country

Irish cave collections demonstrate that a substantially richer mammal fauna reached the island intermittently between at least about 45,000 and 20,000 years ago. Castlepook Cave, near Doneraile in County Cork, is especially important. Its long-accumulated Pleistocene assemblage includes evidence for reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and

spotted hyaena. It would be wrong to place all these animals together at Castlepook in this one calendrical year: cave deposits can combine remains accumulated over many millennia, and carnivores, water movement and early excavation disturbed their contexts.

Even so, the fauna makes the wider ecological point clear. Ireland could support large herbivores and predators in suitable ice-age intervals. Reindeer, mammoth and giant deer imply extensive feeding grounds, while hyaena and wolf remind us that carcasses and caves were not exclusively human spaces. The island's sea crossings were also different in scale from those of today because global sea levels were lower, exposing larger areas of the continental shelf. Lower sea level did not automatically create a proven land bridge to Ireland, however. Routes available to animals or people remain a matter for reconstruction, not an excuse to assume effortless movement.

The Castlepook Human Question

One object makes this period exceptionally significant for Irish archaeology: a reindeer femur from Castlepook bearing a deep surface mark interpreted by zooarchaeologist Ruth Carden as a cut or chop made with a stone tool during carcass processing. Public reporting and County Cork heritage material have described the bone as around 33,000 years old, broadly close to the chronological setting of this article. If the mark is confirmed as human-made and contemporary with the animal's death, it would be evidence that people handled a reindeer in Ireland during the Upper Palaeolithic—far earlier than the better-established terminal-Pleistocene human evidence from Alice and Gwendoline Cave in County Clare.

The limits of that claim must be stated plainly. The femur is from an old cave collection, not a modern excavation of a sealed occupation floor accompanied by a stone-tool assemblage, hearth, shelter, burial or repeated camp deposits. A radiocarbon result dates the animal's death, while identifying a cut mark is a separate taphonomic judgement. Nor can the bone establish whether people hunted the animal, scavenged it, removed meat, hide or sinew, or processed it elsewhere before the limb entered the cave. Recent investigations at Castlepook have sought surviving Pleistocene deposits, but reported no cultural artefacts in the 2022 excavation.

What Cannot Be Claimed

There is no evidence from Ireland around this time for political units, rulers, warfare, diplomacy, named peoples, language or ethnic identity. There is likewise no Irish evidence for farming, herding, cultivated crops, houses, villages, monuments, formal exchange networks, graves, art or religious ceremonies of this antiquity. It is possible that a humanly modified reindeer bone records a brief visit by a small, mobile party equipped with a sharp stone edge. That is an interpretation bounded by the evidence, not proof of permanent settlement.

Accordingly, “society” and “economy” can only be approached at their smallest credible scale. If Castlepook's mark is anthropogenic, it implies practical knowledge of carcass processing and access to lithic technology. It does not reveal family structure, leadership, trade or belief. “Conflict” is represented only by ecological realities—predation, competition for shelter and exposure to severe weather—not demonstrable warfare. “Learning” is visible indirectly in the modern scientific work required to read this landscape: stratigraphy, palaeobotany, entomology, zooarchaeology, radiocarbon dating and the re-examination of museum collections.

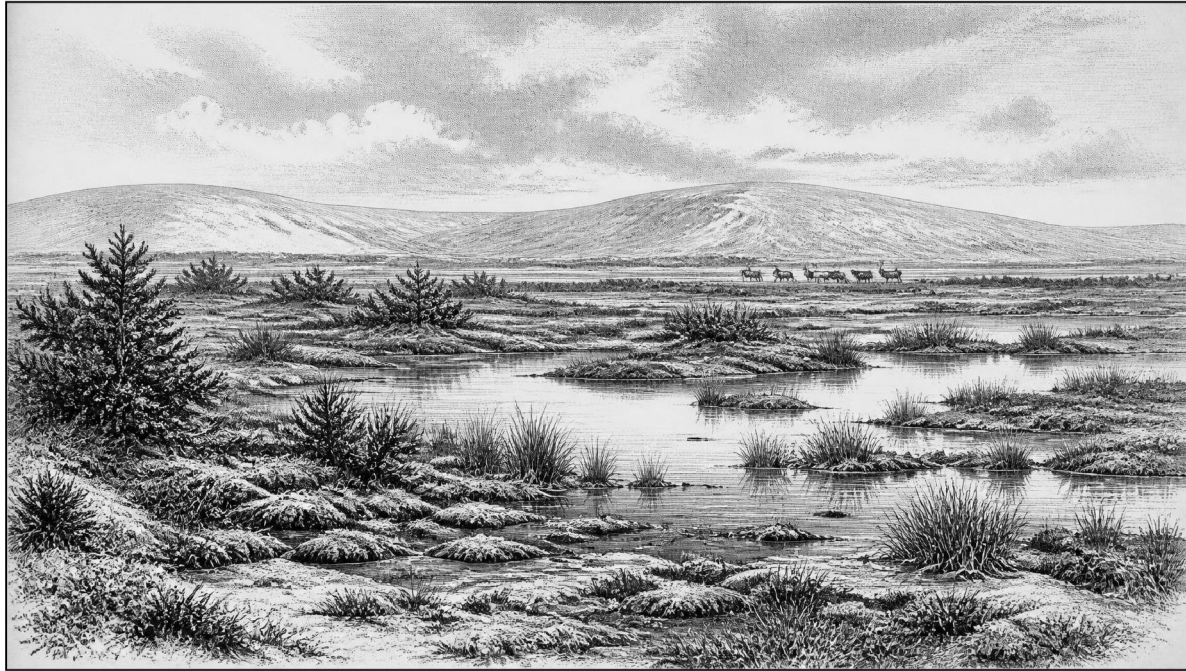
A Landscape Before Later Ireland

The principal development around 31,108 BCE was environmental rather than political. Ireland retained ice-free, tundra-like habitats during a changing phase of the last glacial cycle. At Derryvree, sedges, mosses, insects and freshwater sediments preserve a rare local record of those conditions. Across the island, caves and fossils show that cold-adapted animals could reach and inhabit suitable terrain. Castlepook's marked reindeer femur raises the serious possibility that people did too. But it remains a question anchored in one bone, not a licence to invent a populated prehistoric Ireland. The history here is deep, fragmentary and compelling precisely because its surviving witnesses demand restraint.

Chapter 094 of 100

31107 BCE

Muskeg at Maguiresbridge^[94]



Modern calendar-year precision is not available for Ireland in 31,107 BCE. The label is a retrospective convenience, roughly 33.1 thousand years before AD 1950, the reference point used in ‘BP’ dating. It belongs to the Late Pleistocene, within Marine Isotope Stage 3 (MIS 3): a long, climatically unstable part of the last glacial cycle. No Irish document, settlement sequence or archaeological layer can be assigned to this particular numbered year. The responsible history is therefore a reconstruction of a broad interval, based on buried sediments, fossil animals, glacial landforms and a small number of disputed traces of human action.

The closest unusually informative evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. There, roadworks in 1969 exposed freshwater silts and fine sands sealed between two thick layers of till, the unsorted debris deposited by glacier ice. Organic material from the intervening beds produced a conventional radiocarbon result of 30,500 +1,170/–1,030 years BP (Birm-166). Calibration gives a wide calendar range, broadly about 36,900–31,700 calibrated years BP. The requested date falls within that range, but not at a recoverable point inside it. Derryvree can illuminate the kind of Irish environment that existed during part of this interval; it cannot tell us what happened in a single year.

A Wetland Between Ice Advances

Derryvree is important because it preserves a break in a glacial sequence. The lower till indicates that ice had previously reached the locality. Above it, freshwater sediments accumulated in an ice-free or at least locally deglaciated landscape. The upper till shows that glacier ice later returned. This is powerful evidence against any simple picture of Ireland as continuously buried under one uniform ice sheet

throughout the later Ice Age. It also does not establish that the whole island was open at once. Ireland's ice margins, uplands, lowlands and western marine approaches changed at different times, while later ice erosion destroyed much of the evidence that might have clarified the pattern.

The fossils from the Derryvree deposits indicate open, treeless tundra or muskeg: wet, cold ground with standing pools, saturated mossy surfaces and seasonally thawed sediment. Pollen, seeds, mosses and insect remains point to sedges and grasses, dwarf shrubs, juniper and herb-rich vegetation rather than forest. Botanical evidence includes plants capable of enduring short growing seasons and severe winters. It is a landscape better imagined as a patchwork of shallow water, peat-forming hollows, frost-disturbed soil and sparse cover than as an uninterrupted snowfield. Summer growth could be locally vigorous in wet ground, but the annual regime was harsh and highly seasonal.

The word 'muskeg' should not imply a modern bog transferred unchanged into the past. It is shorthand for the ecological interpretation of the deposits: cold, waterlogged ground rich in mosses and sedges, with open water and organic matter. The evidence is direct for plants and invertebrates found in the deposit; the wider reconstruction of temperature, precipitation and seasonality is interpretation, supported by comparisons with cold-climate environments and by the periglacial character of the sediments. It is not possible to extract a precise mean temperature, a particular winter's snowfall or an annual sequence of floods from this record.

An Island at the Edge of Europe

At this depth of time, 'Ireland' means the landmass now occupied by the island, not a country, people or political territory. There were no known states, chiefs, boundaries, assemblies or diplomatic contacts here. Nor is there evidence for settlements, farms, houses, graves, monuments, language or ritual practice. The categories that dominate later Irish history—kingship, warfare, trade, religion and learned culture—have no securely documented equivalents in the surviving evidence from around 33,100 years ago.

Sea level was far lower than today because large volumes of water were held in northern ice sheets. The Irish Sea basin and coastal shelves consequently looked very different, with more exposed land around the margins. Yet lower sea level should not automatically be turned into a convenient land bridge. Recent syntheses argue that Ireland remained insular during the Pleistocene and that a terrestrial connection to Britain has not been demonstrated. The precise configuration of coasts, straits, sea ice and local ice margins at this early date remains difficult to model. What can responsibly be said is that Ireland lay on north-west Europe's Atlantic edge, and that movement of animals or people cannot simply be assumed from the later map of the islands.

That insular position matters for ecology. Plant and animal populations had to reach, survive in and sometimes disappear from a changing landscape affected by cold, ice expansion and marine barriers. The relatively sparse Irish fossil record reflects both those ecological filters and a geological one: subsequent glaciation scoured or buried many deposits. Caves and unusual sediment traps are therefore disproportionately important. Their survival does not make them complete samples of the island's wildlife.

Castlepook's Animal Evidence

Nearly 400 kilometres south of Derryvree, Castlepook Cave—also called Mammoth Cave—near Doneraile in north County Cork provides the principal Irish vertebrate archive relevant to this broad phase. Excavations and older collections produced bones of cold-stage mammals including woolly

mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena. Reassessment of the cave's radiocarbon chronology has been necessary because many older dates and collections have limited contextual information. The cave assemblage should therefore not be treated as a census of animals alive together in one moment, still less in 31,107 BCE.

Nonetheless, Castlepook demonstrates that, during portions of MIS 3 before the Last Glacial Maximum, Ireland could support or receive a distinctive cold-climate fauna. Reindeer and hare fit an open landscape; lemmings and Arctic fox underline the severity of at least some conditions. Mammoth, giant deer, wolves and hyaenas reveal a food web more varied than the Derryvree wetland alone could show. Carnivores may have carried carcass parts into caves, while flooding, scavenging and earlier excavation methods could mix remains. Bones are evidence of species presence and taphonomic processes, not straightforward proof of a stable local animal community.

The coming ice maximum is the larger environmental story. Modern reconstructions of the last British–Irish Ice Sheet place major growth and changing ice-sheet behaviour across the period beginning around 31,000 years BP, with maximum expansion later, broadly during the interval around 27,000–23,000 calibrated years BP in Irish offshore records. The Derryvree sequence preserves one earlier cold but ice-free episode at that locality before renewed ice advance. Around the nominal date, then, environmental instability—not a settled and unchanging ‘Ice Age landscape’—is the central historical fact.

The Human Question

The possibility of very early human presence makes this period especially significant, but it must be stated cautiously. A reindeer bone from Castlepook has been redated to around 33,000 years old and bears a deep modification interpreted by zooarchaeologist Ruth Carden as potentially resulting from a sharp tool used on fresh bone. If that interpretation is confirmed, it could indicate a brief episode of human carcass processing in Ireland far earlier than the previously accepted evidence for human activity.

It is not, however, proof of a population, camp, journey, technology or society. No securely associated stone-tool assemblage, hearth, dwelling surface, human remains or stratified occupation deposit has yet established an Upper Palaeolithic settlement in Ireland at this date. The mark itself requires continued microscopic, experimental and contextual assessment, because bone surfaces can be modified by carnivores, trampling, sediment movement, excavation damage and other processes. Current Castlepook investigations are valuable precisely because they seek undisturbed deposits in which faunal remains, sediments and any cultural material can be assessed together.

For perspective, the published and more securely contextualised evidence for Late Upper Palaeolithic people in Ireland is much later: cut marks on a brown-bear patella from Alice and Gwendoline Cave, County Clare, dated to about 12,800–12,600 calibrated years BP. That later discovery does not disprove earlier visits. It does show why a cautious distinction is essential between an intriguing possible signal and an established occupation record.

What Cannot Be Written

There is no responsible basis for describing political affairs, conflict, diplomacy, trade routes, religious ceremonies or cultural learning in Ireland in 31,107 BCE. Nor can an economy be reconstructed in the normal historical sense. If people did reach the island, they may have sought animal resources or

shelter, but that is an inference from the ecological setting, not an Irish archaeological fact. It would be equally unwarranted to assign them a named continental archaeological culture merely because broadly contemporary Upper Palaeolithic traditions existed elsewhere in Europe.

The strongest account of this date is therefore modest but substantial. Parts of the island experienced a cold, open and watery periglacial environment, documented most clearly by the Derryvree freshwater series beneath a Fermanagh drumlin. Cold-adapted mammals inhabited or intermittently reached Ireland, as the Castlepook cave fauna shows. Ice would later expand dramatically and erase much of the evidence. At the edge of this changing world lies an unresolved human question: perhaps a fleeting encounter with a reindeer carcass, but not yet a demonstrable Irish community. The history of this year is not a chronicle of events. It is the survival of mud, pollen, moss, insect remains and bone across more than thirty-three millennia.

Chapter 095 of 100

31106 BCE

Fermanagh's Bogbean Interval^[95]



A Date Inside a Range

“31,106 BCE” is a modern chronological label, not a date that anyone in prehistoric Ireland could have known or recorded. There was no writing, calendar, named community or archaeological sequence capable of identifying one particular year. In radiocarbon terms the label falls approximately 33,000 calendar years before AD 1950, the conventional scientific “present”; but that conversion should not imply annual precision. The most useful Irish evidence belongs to broader calibrated ranges. Around this point, Ireland lay in the later part of Marine Isotope Stage 3, a long and climatically unstable phase before the Last Glacial Maximum. The closest well-dated Irish environmental archive is the Derryvree deposit near Maguiresbridge, County Fermanagh: organic freshwater sediments whose published radiocarbon result calibrates broadly to about 36,900–31,700 cal BP. The date in question sits within that wide interval, not at a pinpoint in its layers.

Derryvree matters because the deposit was found sealed between two substantial sheets of glacial till in a drumlin exposed by road works in 1969. Such preservation is exceptional. Later ice movement scoured, mixed, buried or removed much of Ireland’s older surface evidence, leaving few archives from this period. The silts and fine sands at Derryvree therefore do not tell us what happened in one named year. They preserve a compressed environmental record of a period in which fresh water, plants, insects and sediment accumulated before renewed glaciation covered the site. It is an archive of conditions and ecological possibility rather than a narrative of events.

A Wetland Between Glaciations

The Derryvree fossils point to a treeless, periglacial wetland: a mosaic of saturated ground, mosses, sedges, shallow pools and low tundra vegetation. The published plant evidence includes grasses and sedges, juniper and herbaceous plants, with mosses especially prominent. Bogbean (*Menyanthes trifoliata*), an aquatic or marsh plant still found in suitable Irish wetlands, is among the evocative survivors. Other indicators associated with the deposit include dwarf willow, mountain-avens, Arctic-alpine clubmoss and water-milfoil. Together they rule out the familiar wooded Ireland of later prehistory. They instead suggest open ground with short growing seasons, cold winters and waterlogged hollows.

“Muskeg” is sometimes used for this environment: not a perfect modern equivalent, but a useful shorthand for peat-forming, moss-rich, wet ground broken by open water. Insect remains support this picture of pools rich in plant matter amid cold-climate vegetation. The evidence is local, however. It should not be expanded uncritically into a uniform map of the island. A roadside exposure in Fermanagh records one lowland basin and its catchment, not every coast, mountain or valley. Yet it securely shows that, within a broader cold phase, at least part of Ireland supported a living freshwater ecosystem rather than lying continuously beneath ice.

The climate was severe but not static. Ireland’s position beside the North Atlantic made it responsive to abrupt last-glacial shifts. Speleothems in Crag Cave, County Kerry, provide an independent kind of evidence: calcite could grow only when liquid water entered the cave and temperatures were sufficiently mild to permit it. Uranium-thorium dates show episodic growth during Marine Isotope Stage 3, consistent with repeated ameliorations and deteriorations rather than a single, uninterrupted freeze. This does not mean Derryvree was warm. It means that “Ice Age” conditions contained rapid environmental pulses, in which ground water, vegetation and animal ranges could change over timescales far shorter than archaeological period labels suggest.

Ice Was Building, Not Yet at Its Maximum

At around 31,106 BCE, the Last Glacial Maximum still lay ahead. Older reconstructions conventionally placed the main build-up of the British–Irish Ice Sheet after roughly 35–32 ka, with its maximum extent later, broadly during 27–21 ka. More recent BRITICE-CHRONO work likewise portrays a dynamic, unevenly advancing ice sheet rather than an island covered everywhere at once. Its 31 ka reconstruction models a large ice cap over north-western Ireland, spanning the Derryveagh and Sperrin Mountains, and smaller ice fields or glaciers in several upland districts, including the Dartry Mountains, Wicklows, Mourne and south-western ranges. Models are valuable syntheses of field evidence and ice physics, but they remain reconstructions rather than direct photographs of the landscape.

This setting gives Derryvree its particular force. The organic layer proves an ice-free phase at the locality before it was overridden by the younger till, while the wider island was entering a period of increasing glaciation. The wetland may have been close to active ice or to landscapes shaped by older ice, but its sediments do not allow a precise distance from a glacier margin to be calculated. Nor can they establish the length of every season. What they do demonstrate is regional change: water collected in a low basin; tundra plants colonised its edges; organic matter survived long enough to form a recognisable deposit; and a later advance sealed this evidence below the drumlin.

Sea level was lower than today as global ice sheets grew, exposing parts of the continental shelf around north-west Europe. That fact should not be turned into a simple picture of a dry, easy land bridge to Ireland. The configuration of land, sea, ice and coasts changed through time, while northern routes

were complicated by ice masses and marine inlets. For people or animals, any crossing would have depended on particular routes and seasons that Irish evidence cannot reconstruct for this date. The island's apparent accessibility is therefore an open palaeogeographical question, not proof of migration.

Animals and the Limits of the Cave Record

Irish cave collections nevertheless show that substantial mammals occupied, or at least reached, the island during broad parts of this pre-maximum interval. The Irish Quaternary Fauna Project dated material from caves including Castlepook in north Cork. Its results demonstrate a varied Late Pleistocene fauna over tens of millennia: reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings, spotted hyaena and woolly mammoth occur among the dated cave assemblages. At Castlepook, particular reindeer, mammoth and giant-deer specimens produced conventional radiocarbon ages in the broad 32,000–39,000 BP range. These finds make an open, cold-country fauna plausible for Ireland during Marine Isotope Stage 3.

But the cave evidence has a crucial limitation. A cave is not a census of a single living landscape. Bones can have been carried in by carnivores, water or people; animals from different episodes can be mixed; and many of the key specimens were recovered in early excavations, before modern standards of stratigraphic recording. A mammoth rib, hyaena bone and reindeer limb from one cave do not prove that those animals stood together on one day, still less in 31,106 BCE. The responsible conclusion is broader: Ireland contained, at different points in the period, habitats capable of supporting large herbivores and formidable carnivores, but its surviving faunal record is fragmentary and time-averaged.

The Human Question

The same caution is even more important for people. A reindeer femur from Castlepook Cave has been publicised as approximately 33,000 years old and as bearing a deep mark interpreted as a stone-tool cut or chop made while a carcass was processed. If future study confirms both the taphonomic interpretation and its dating context, the specimen could be evidence of a very early Upper Palaeolithic visit to Ireland. It would be historically important precisely because it is so rare. Yet it came from an old cave collection, not from a modern excavation of an intact occupation floor, and no securely associated hearth, stone-tool assemblage, dwelling, human remains or repeated activity area of comparable age has been identified. The bone's age dates the animal, not automatically the moment of marking, the place of death or the duration of any human presence. It cannot demonstrate a settled population.

The earliest firmly published evidence for human activity in Ireland remains much later: cut marks on a brown-bear kneecap from Alice and Gwendoline Cave, County Clare, directly dated to about 12,810–12,590 cal BP. That contrast is instructive. It is reasonable to treat a possible Castlepook trace as an important research question for the earlier period, but not as permission to invent a 31st-millennium BCE camp, hunting party or migration. The archaeological silence may reflect genuine absence, brief visits that left little trace, loss of sites to ice and sea, or all three.

No Politics, but a Changing World

There is no evidence for political institutions, leaders, territories, warfare, diplomacy, trade networks, formal religion, art or learning in Ireland at this date. Such categories depend on records that do not survive here, and it would be misleading to borrow the richer Upper Palaeolithic societies of continental Europe and install them in Fermanagh or Cork. If people did enter Ireland, the most that can be said is

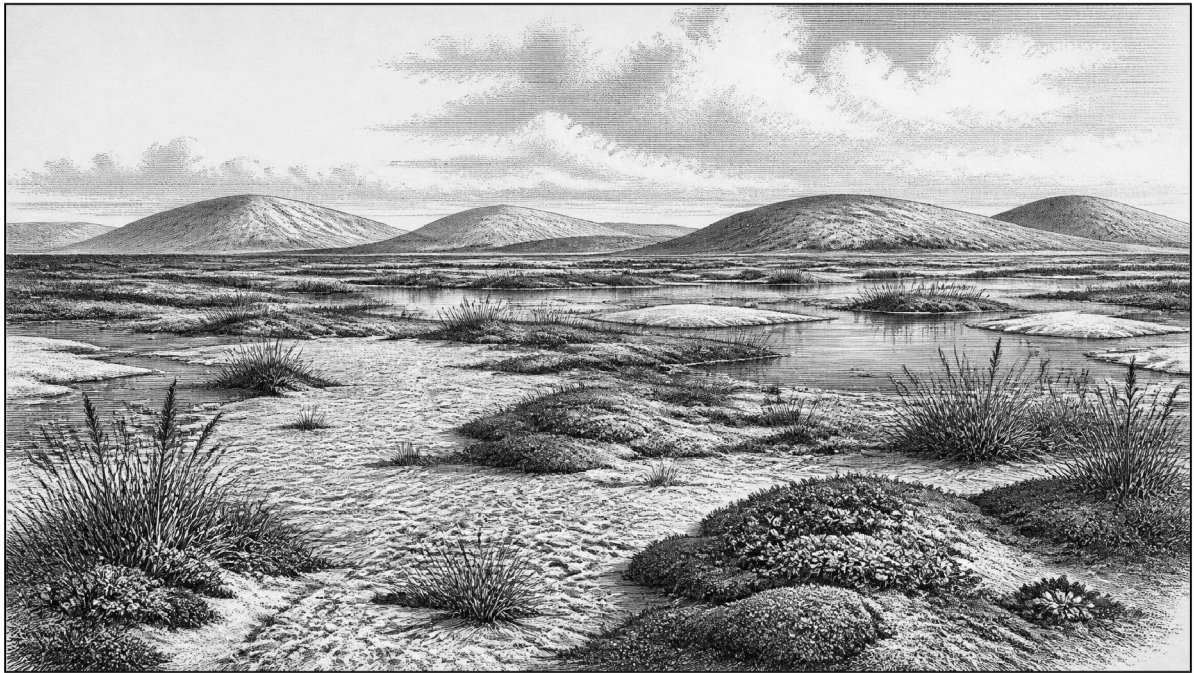
that they may have been highly mobile foragers able to use cutting tools and exploit animal resources. Whether they hunted, scavenged, travelled by water, followed herds, exchanged knowledge, or returned repeatedly is unknown.

Everyday life is better approached through ecology than through imagined households. Any human visitor would have faced exposed terrain, sharply seasonal resources, wet ground and an unpredictable climate; reindeer and other large mammals would have offered food, hide, bone, sinew and fuel potential, but none of those uses is directly attested at Derrynree. The principal story around 31,106 BCE is consequently environmental and regional: an Irish landscape of ice fields and ice-free refuges, low wetlands and open tundra, inhabited by cold-adapted plants and, at times, large mammals. Derrynree's buried bogbean seed and mossy sediments are modest remains, but they provide more reliable history than a detailed tale of people for whom Ireland has not yet yielded a secure home.

Chapter 096 of 100

31105 BCE

BIRM-166's Thawwater Flora^[96]



31,105 BCE is a modern calendar label, not a year that anyone in Ireland could have named, recorded or remembered. There are no annals, rulers, settlements or archaeological layers that can be assigned to that particular twelve-month span. In radiocarbon convention it falls roughly 33,054 years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3: a climatically unstable part of the last Ice Age. The responsible history of Ireland at this depth in time is therefore not an event-by-event narrative. It is an account of dated sediments, animal remains, ice-sheet evidence and the limits those traces impose on interpretation.

A Date Within Wide Ranges

The strongest Irish evidence close to this notional date comes from Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and exposed an exceptional sequence: freshwater silts and fine sands, including organic material, lay between two separate beds of till, the unsorted sediment deposited by glacier ice. The lower till showed that ice had previously crossed the site; the upper till showed that ice later returned and sealed the intervening deposits. Between those episodes, water and vegetation had persisted long enough to form a local environmental archive.

The principal radiocarbon determination from the organic beds, BIRM-166, was published as 30,500 years BP, with an uncertainty of +1,170 and -1,030 years. Such figures are not calendar dates. Radiocarbon ages must be calibrated against independent records of past atmospheric carbon, and the uncertainty becomes substantial at this antiquity. Expressed cautiously, discussion of the Derryvree result places the deposit broadly around 36,900–31,700 calibrated years BP, approximately 34,950–29,750 BCE.

The label 31,105 BCE sits within that broad window, but cannot be matched to a particular season, water level, animal or human action. It is evidence for an interval measured in millennia, not for a day in an Irish calendar.

Older regional terms call this the Derryvree Cold Phase, part of the Middle Midlandian sequence. Such labels are useful shorthand for deposits and changing environments, but they should not imply that all of Ireland experienced one uniform climate or that its timing is fixed to the year. Modern reconstructions of the British–Irish Ice Sheet likewise show a changing, asynchronous system, rather than a single neat advance across every region at once.

Fresh Water Between Glaciers

Derryvree's importance lies in its contents. Plant macrofossils, pollen, mosses and small animal remains described from the freshwater sediments point to a cold, open and treeless landscape. Sedges, mosses, dwarf shrubs and tundra-associated plants grew around shallow water, wet ground and mineral-rich mud. The assemblage has often been described as muskeg: a waterlogged, mossy and sedgy environment shaped by cold conditions, a short growing season and imperfect drainage. It was not the dense woodland familiar from much later Irish prehistory.

This was nevertheless not simply an empty frozen wilderness. Freshwater vegetation requires liquid water during at least part of the year; pollen and plant remains demonstrate living communities, however low and sparse. Insects and other small fossils add detail to the impression of periglacial conditions—ground exposed to severe seasonal frost, snowmelt and freeze-thaw action rather than permanently buried beneath ice at that locality. The Derryvree evidence is especially valuable because later glacial action destroyed, rearranged or concealed many earlier land surfaces elsewhere in Ireland.

The landscape should not be reconstructed as a single unbroken plain. Drumlins, valleys, wet basins, exposed slopes, snow patches and watercourses would have created local contrasts. Around the Derryvree basin, the waterlogged vegetation was one component of a wider open country. Distant tree pollen, where present in tiny quantities, cannot responsibly be treated as proof of nearby forest: pollen can travel far. The broader assemblage supports a cold, largely treeless environment.

Animals on an Open Range

County Cork cave deposits provide a complementary, though more complicated, record. Castlepook Cave near Doneraile has yielded remains of reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena. This remarkable fauna establishes that Ireland supported, at different points before the Last Glacial Maximum, cold-adapted mammals and the predators or scavengers associated with them. Reindeer and mammoth particularly indicate open grazing landscapes rather than closed woodland.

Yet Castlepook is not a photograph of one year. Its bones were recovered from a complex cave system and many originated in historic excavations, before modern standards of stratigraphic recording. Radiocarbon dating by the Irish Quaternary Fauna Project showed that specimens once assumed to belong together could date to very different periods. Carnivores may have dragged carcass parts into the cave; water, frost, collapse and earlier digging could also move material. The evidence supports an Ice Age food web in Ireland over a long span, not the claim that every recorded species lived side by side in 31,105 BCE.

Even so, the combined Fermanagh and Cork evidence changes the scale at which this island should be imagined. Ireland was not yet the later green, forested island of popular imagination. It lay on the north-western edge of Europe, repeatedly affected by altered sea levels, shifting ice margins and severe climates. Its animal populations were probably intermittent and vulnerable to environmental change. Presence in the surviving record proves arrival or occupation at some point; absence may simply reflect the loss of deposits or the incompleteness of collection.

The Narrow Human Question

No securely excavated hearth, dwelling, stone-tool assemblage, human burial or settlement surface has been published for Ireland at this age. There is therefore no foundation for describing an Irish community in 31,105 BCE, still less its language, kinship rules, leaders, territorial boundaries or identity. The National Museum of Ireland has long stressed the absence of a conventional, securely documented Palaeolithic occupation record on the island. Substantial, repeated evidence for settlement belongs much later, after the final retreat of the ice, with Mesolithic hunter-gatherers from about the eighth millennium BCE.

A single object makes the question more complicated. A reindeer femur from Castlepook, now in the National Museum of Ireland's Natural History collections, has been publicly presented by zooarchaeologist Ruth Carden and County Cork heritage publications as bearing a deep mark made with a sharp stone tool while the bone was fresh. The specimen has been assigned approximately to 31,000 BCE. If that identification is confirmed through continuing specialist study and supported by securely stratified material, it could indicate that Upper Palaeolithic people processed a reindeer in Ireland during this broad period.

That is an important possibility, but a narrow one. The radiocarbon age dates the animal bone, not the precise instant of its marking. A single modification does not reveal whether people killed the reindeer, encountered it after death, removed meat, hide, sinew or marrow, or worked the carcass elsewhere before a scavenger transported the bone into a cave. Nor can it establish a permanent population, a regular migration route, a land bridge, boats, or descent from those possible visitors to later inhabitants. Until corroborated by artefacts and excavated context, a short human incursion remains an interpretation rather than a demonstrated settlement history.

No Politics, Trade or Known Cult

Accordingly, there is no evidence for political affairs, warfare, diplomacy, formal trade, agriculture or social institutions in Ireland at this date. There were no states, named peoples, chiefs or borders that archaeology can recover here. Nor is there Irish evidence from this horizon for shrines, graves, monuments, cave art, portable art or a system of learning. Upper Palaeolithic communities elsewhere in Europe made sophisticated stone tools and visual art, but continental parallels cannot be imported as facts about Ireland. They provide context for what possible visitors might have known, not proof of what occurred on this island.

If people did briefly reach Ireland, the most modest inference is that they were highly mobile foragers able to use a sharp stone edge and exploit animal resources. That inference must remain separate from the evidence itself: the evidence is a reportedly modified reindeer bone, not an excavated camp. For the rest,

the clearest story is environmental. The freshwater plants at Derryvree, the cold-adapted fauna of Castlepook and the tills enclosing or disturbing older ground together reveal a country repeatedly made available, reshaped and in places erased by Ice Age change.

Approaching the Great Expansion

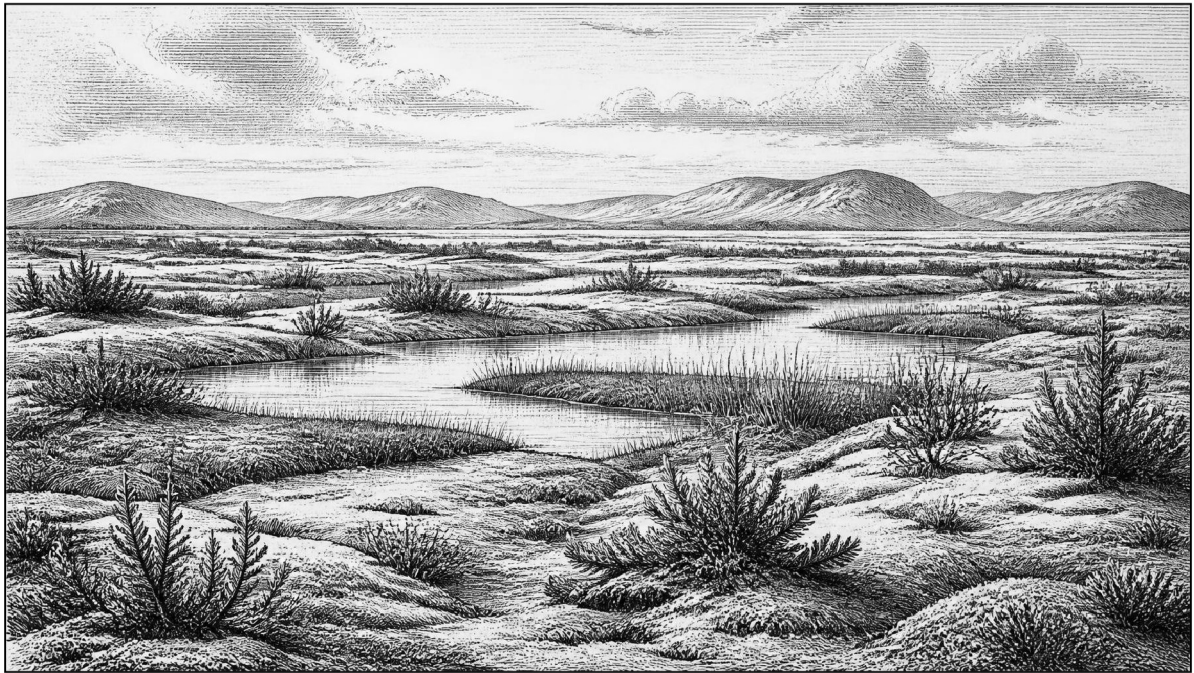
At about this timescale, Ireland was approaching the major growth phase of the last British–Irish Ice Sheet, although local conditions varied and the chronology remains under active refinement. The ice sheet later achieved its greatest overall volume around 23,000 years ago. Derryvree’s two tills make the longer sequence visible in one place: an earlier glacial advance, an ice-free enough interval for a cold freshwater ecosystem, and a later advance that entombed it. The organic bed is thus both a record of life and a record of interruption.

For 31,105 BCE, that interruption is the history. It offers no named event, but it does preserve a rare glimpse of Irish ground between episodes of ice: shallow water, sedges and mosses under a severe climate; open country capable of supporting distinctive mammals; and, perhaps, the unresolved trace of a human encounter with a reindeer. The uncertainties are not a defect to be concealed. They are the essential fact of Ireland’s deep past, and they define what can responsibly be said about this otherwise calendarless age.

Chapter 097 of 100

31104 BCE

Derryvree's Intertill Witness^[97]



31,104 BCE is a modern filing date, not a recoverable Irish year. No written record, named community, dated settlement floor or archaeological sequence can identify an event in Ireland within this particular year. In calendar terms it lies about 33,050 years before the AD 1950 reference point conventionally used in radiocarbon dating, during the later part of the last Ice Age's Marine Isotope Stage 3. The responsible history of this moment must therefore be told through broad calibrated ranges, buried deposits and cautious comparison, rather than through an invented annual chronicle.

The closest major Irish environmental record is the Derryvree freshwater deposit near Maguiresbridge, County Fermanagh. Its conventional radiocarbon result, BIRM-166, was 30,500 radiocarbon years BP, with a large uncertainty. Calibration converts this into a much broader calendar range, published at roughly 36,900–31,700 calibrated years BP; later regional modelling places the relevant ice-free evidence around $33,500 \pm 1,200$ years ago. The notional year considered here falls within that wide horizon. It does not date a particular pool, plant, animal or human action to 31,104 BCE.

A Wetland Between Ice Advances

Derryvree was revealed in a road cutting through a drumlin in 1969. The sequence was remarkable: a lower till, a middle bed of freshwater silts, fine sands and organic material, and a later till above. Till is unsorted sediment laid down by glacier ice. The order of these deposits provides firm evidence for a profound local change: ice had affected the district; water, vegetation and sediment then accumulated in an ice-free interval; and renewed glacial conditions eventually buried and preserved the wetland.

The biological remains are the real witness. Pollen, plant macrofossils, mosses and insect remains indicate open, cold and waterlogged ground. Grasses and sedges were important, while plants associated with chilly wet habitats, including bogbean, water-milfoil, mountain avens and lesser clubmoss, have been reported from the sequence. Juniper and dwarf willow probably occupied better-drained patches. The insects include terrestrial and aquatic forms, supporting the picture of shallow pools, mossy margins and plant-rich water rather than a sterile frozen surface.

This was not the familiar wooded Ireland of later prehistory. Trees were absent locally or too scarce to form forest. The older term *muskeg* is often used for the reconstructed landscape: saturated, peaty tundra-like ground broken by pools and sedge beds. It should not be mistaken for a complete island-wide landscape map, still less for an exact season in an exact year. Derryvree records one basin and its catchment. Yet it securely demonstrates that at some point in this broad late-MIS-3 interval, south Fermanagh supported freshwater life between episodes of glaciation.

Cold Country, Not Permanent Ice

The wider setting was unstable. Ireland was approaching the major growth of the last British–Irish Ice Sheet, but had not yet reached the better-documented maximum that came later, principally between about 27,000 and 23,000 years ago in different sectors. Modern reconstructions show that ice-sheet build-up, maximum extent and retreat were asynchronous: an advancing margin in one region did not necessarily mean that every part of Ireland was simultaneously buried beneath a uniform ice cover.

Derryvree is therefore important corrective evidence. It rules out the simplest picture of continuous island-wide glaciation throughout the period. It does not establish that all Ireland was habitable, ice-free or connected by dry land at 31,104 BCE. Uplands, coasts, lowlands and the surrounding sea shelf responded differently to climate and topography. Ice, seasonal snow, frost-shattered ground and shifting drainage could all have constrained movement. Lower global sea levels altered the geography around Ireland, but the surviving Irish evidence cannot specify a reliable land route, a crossing season or whether people used one.

The later ice sheet also helps explain why the record is so fragmentary. Repeated glacial erosion, redeposition and burial transformed older landscapes; any exposed campsites, hearths or tracks were especially vulnerable. The absence of a known settlement is consequently not simple proof that no people ever entered Ireland. But it is equally not a licence to populate the island with imagined bands of hunters. The evidence establishes a changing environment more securely than it establishes a human population.

Castlepook's Uneven Fauna

County Cork provides the principal complementary archive. Castlepook Cave, near Doneraile and also called Mammoth Cave, yielded Ireland's richest known assemblage of Late Pleistocene vertebrate remains. Its old excavations recovered bones of woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, lemmings, mountain hare and spotted hyaena. Taken together, these finds demonstrate that Ireland was repeatedly ecologically connected to the wider north-west European world during parts of the Ice Age. Large grazing animals and their predators or scavengers could reach, or survive in, parts of the island.

That conclusion requires an important qualification. Castlepook is not a single occupation layer or a contemporary wildlife census. Its passages accumulated remains over a long period, through natural deaths, carnivore activity, water movement, collapse and disturbance. Early twentieth-century excavation

removed much material before modern stratigraphic recording was possible. Direct re-dating has also shown that several older bone dates understated the true ages by thousands of radiocarbon years. Individual remains demonstrate the presence of species at broad times; they do not prove that every listed animal encountered every other animal, or lived beside Derryvree in this particular year.

Nevertheless, the fauna gives scale and texture to the open landscapes suggested by Fermanagh's wetland. Reindeer are well suited to mobile life in sparse, seasonal grazing country. Mammoth and giant deer imply sizeable herbivore habitats at least intermittently. Hyaenas, wolves and foxes show that carrion, predation and scavenging formed part of a more complex food web. This was not a settled agricultural landscape with livestock and cleared fields. It was a fluctuating cold-stage environment in which animal movements would have followed changing vegetation, snow cover, water and ice margins.

The Human Question

One Castlepook object raises the possibility of an exceptionally early human presence. A reindeer femur in the historic collection bears a deep incision interpreted by zooarchaeologist Ruth Carden as a mark made by a sharp stone tool during butchery. County Cork heritage material places the bone at about 31,000 BCE, broadly close to this article's nominal horizon. If that interpretation is accepted, it is evidence that people processed a reindeer in Ireland during the Upper Palaeolithic, far earlier than the securely established post-glacial settlement record.

The distinction between observation and interpretation is essential. The bone and its mark are physical evidence. Identifying the mark as stone-tool damage is a specialist taphonomic judgement. Inferring hunters, a seasonal reindeer pursuit, a route from Britain, or a resident Irish population goes further still. No stone tool, hearth, shelter, human bone, repeated occupation surface or securely excavated kill site is known from Castlepook for this period. The femur may have been processed elsewhere and later transported to the cave by carnivores or natural processes. It cannot show whether people killed the animal, scavenged it, camped nearby or returned.

Accordingly, permanent settlement cannot responsibly be claimed for Ireland in 31,104 BCE. A brief visit by highly mobile people is possible if the cut-mark diagnosis is correct. Beyond that, the evidence is silent about language, family structure, clothing, social rank, ritual or technology. Upper Palaeolithic communities elsewhere in Europe used sophisticated stone implements, fire, tailored clothing and long-distance social networks, but those comparisons describe what may have been possible, not what has been demonstrated in Ireland.

No Politics, No Diplomacy

There are no identifiable Irish political affairs for this date: no kingdom, tribe, chief, boundary, treaty or battle. There is likewise no evidence for formal religion, shrines, monuments, learning institutions or exchange systems. It would be misleading to invent them merely because the article is arranged around a numbered year. If people did enter Ireland, their economy may have included the opportunistic use of animal resources such as meat, hide, marrow, sinew and bone; that remains an inference from the possible butchery mark and the wider animal record, not a documented Irish economy.

For everyday life, the strongest evidence concerns non-human life. Short growing seasons, frost, exposed ground and shifting water limited what plants and animals could do. Yet Derryvree's pools and mossy wetlands show that cold conditions did not mean biological emptiness. Freshwater, sedges, herbs,

insects and small patches of sheltered vegetation created usable habitats, while the Castlepook record shows that larger mammals periodically formed part of Ireland's wider ecological world.

An Archive Rather Than an Anniversary

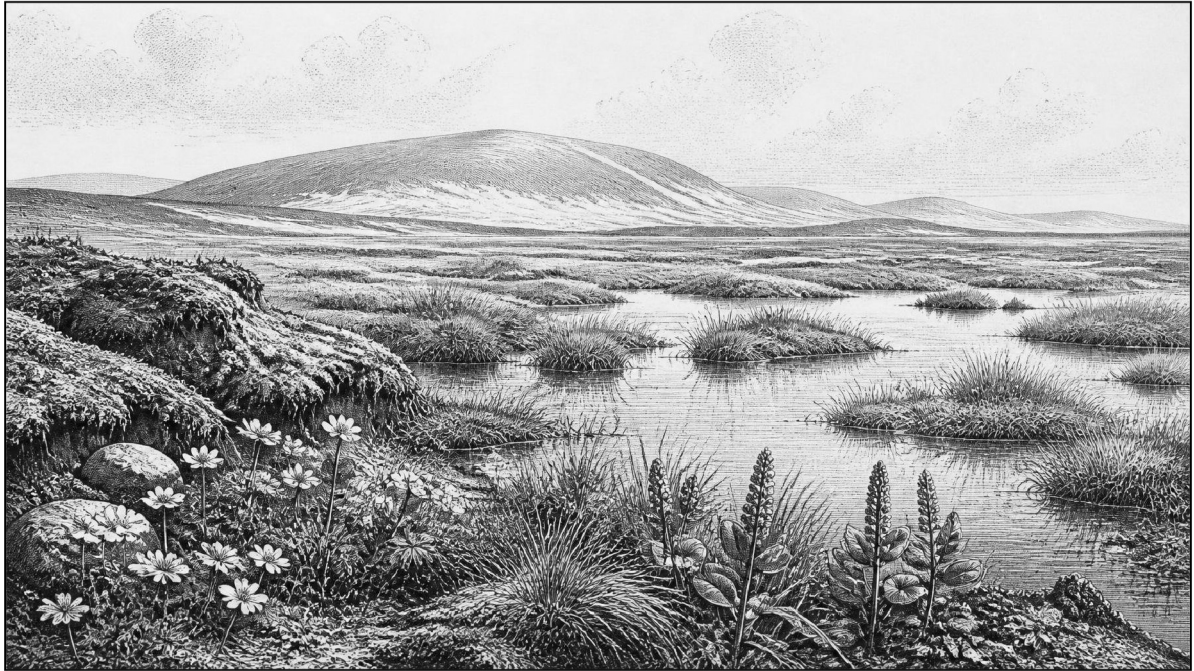
The most meaningful development around 31,104 BCE was not a recorded human deed but a changing landscape. Derryvree preserves a rare interval when life accumulated in a cold Fermanagh wetland before later ice sealed it beneath till. Castlepook preserves a separate, time-averaged record of animals that reached Ice Age Ireland, and perhaps a single trace of human carcass-processing. Together they replace the false image of an eternally frozen, empty island with a more compelling one: a region of local refuges, open country, freshwater and mobile fauna, exposed to climatic instability and approaching more extensive glaciation.

This is why modern calendar precision must be resisted. The evidence can illuminate an age, not an anniversary. Around the broad horizon labelled 31,104 BCE, Ireland was neither a known human homeland nor a blank page. It was a difficult, dynamic Late Pleistocene landscape whose buried silts, bones and ice-laid sediments preserve only scattered witnesses to lives and environments far older than Ireland's later archaeological record.

Chapter 098 of 100

31103 BCE

Derryvree's Alpine Marsh ^[98]



The label 31,103 BCE is a modern chronological convenience, not a date that can be matched to an event in Ireland. It lies about 33,052 years before AD 1950, the conventional reference point used in radiocarbon chronology, but no Irish community counted years in this way, left writing, or created an archaeological sequence precise enough to identify a particular season, person or occurrence. The responsible history of this notional year is therefore a history of dated ranges, sediments and probabilities.

Ireland was in the Late Pleistocene, within Marine Isotope Stage 3, during the long and unstable cold interval preceding the Last Glacial Maximum. Conditions altered sharply over centuries and millennia, and they varied by region. The best evidence relevant to this point in time comes from a buried freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh, together with cave faunas in southern Ireland and broader reconstructions of the British-Irish Ice Sheet. They illuminate a cold landscape with open vegetation and wet ground, but they cannot furnish a calendar-year snapshot of the island.

A Date Within a Range

The key Derryvree evidence was exposed during roadworks in 1969, when a cutting through a drumlin revealed organic silts and fine sands trapped between two separate sheets of glacial till. This order matters. An earlier glacier had laid down till; at some later time the locality supported standing or slow-moving freshwater and wetland vegetation; then renewed ice overrode and sealed the deposit beneath a further till sheet. It is one of Ireland's rare surviving archives for an ice-free interval during the last glacial cycle.

The organic material produced the conventional radiocarbon determination Birm-166: 30,500 radiocarbon years before present, with a sizeable uncertainty of +1,170 and -1,030 years. Radiocarbon years are not identical to calendar years. Later calibration places the deposit broadly between about 36,900 and 31,700 calibrated years before present. That wide span overlaps the modern numerical position of 31,103 BCE, but does not prove that every fossil in the layer grew, died or was buried in that named year. Nor should the site be treated as a weather report for all Ireland. Its strength is more precise and more valuable: it establishes that north-central Ireland contained an ice-free, cold freshwater environment during part of this interval.

Wet Ground Between Glaciations

Derryvree's plant and animal remains indicate an open, treeless tundra or muskeg landscape under periglacial conditions. Mosses, sedges, insects and plant macrofossils accumulated around shallow water, while herbs and low-growing plants occupied the surrounding ground. Mountain-avens, a plant now associated in Ireland with Arctic-alpine settings, occurred in the deposit. So did bogbean, whose fossil seed shows that freshwater pools or marsh margins sustained aquatic vegetation even in a severe cold-stage climate.

This was not a land of uninterrupted snow or featureless ice. Water could collect in hollows; fine sediment settled in quiet pools; plant communities took hold where moisture, seasonally thawed ground and available light allowed. Yet this was still a harsh world. The vegetation points to little or no woodland, short growing seasons and conditions shaped by frost. The term 'muskeg' conveys waterlogged, peaty ground, but it should not suggest a modern peat bog reproduced unchanged in deep time. The Derryvree assemblage records a particular cold freshwater ecosystem, not a complete map of the island.

The stratigraphy also records environmental change on a dramatic scale. The lower and upper tills demonstrate glacier activity before and after formation of the organic bed. At Derryvree, therefore, the history is neither a simple advance of ice nor a smooth thaw. It is a sequence of glaciation, exposed ground with water and vegetation, and renewed glaciation. Much of the evidence for this period has survived only because it was rapidly buried. Elsewhere, later ice erosion, meltwater, coastal change and thousands of years of soil formation have removed or reworked comparable traces.

Before the Maximum Ice

The date falls before the fullest documented expansion of the last British-Irish Ice Sheet. Reconstructions differ in detail, but they broadly place the major maximum extent of that ice sheet after this interval, around 27,000 to 21,000 years before present; marine evidence west and north-west of Ireland indicates shelf-edge ice later in the last glacial cycle. At 31,103 BCE, Ireland was already part of a cold North Atlantic world in which glaciers and ice sheets were growing and reorganising, but it should not automatically be pictured as uniformly buried beneath the later maximum ice cover.

Ice-sheet history was regional and dynamic. Uplands, coastal shelves, lowlands and drainage basins did not necessarily share the same conditions at the same time. The Derryvree sediments demonstrate ice-free ground in Fermanagh during their dated interval; they do not establish that all of Munster, Connacht, Leinster or Ulster was simultaneously open. Conversely, a local wetland does not imply a mild climate. The lesson is one of mosaic landscapes: frozen or seasonally frozen ground, pools and marshes, areas influenced by nearby ice, and habitats that could briefly support specialised plants and animals.

Sea level was much lower than today because vast volumes of water were stored in northern ice sheets. Ireland, Britain and the continental shelf formed a changing geographical system rather than the familiar modern island setting. Whether routes were continuously usable depended on sea level, ice margins, rivers, terrain and climate. It is reasonable to infer that animals could move into and out of Irish landscapes during favourable phases; it is not responsible to draw a neat land bridge, assign a route to a particular herd, or suppose permanent human settlement from geography alone.

Animals in the Irish Record

The richest evidence for Late Pleistocene animals in Ireland comes from limestone caves, especially Castlepook Cave near Doneraile in County Cork. Museum collections and more recent investigation show that the cave system contains remains attributable across a long span of time, including woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena. Such animals did not necessarily occupy the cave, or even southern Ireland, together at one moment. Cave deposits commonly combine material brought in by carnivores, animals dying naturally, water movement, roof collapse and earlier excavation.

Nevertheless, the fauna demonstrates that Irish environments in parts of Marine Isotope Stage 3 could support a far more varied large-mammal community than exists on the island today. Reindeer were suited to open, cold-country habitats; lemmings and Arctic fox imply similarly severe conditions. Hyaenas, wolves and bears remind us that the landscape was ecologically active, with scavenging, predation and competition as well as grazing. Mammoth and giant deer remains belong to this wider Pleistocene story, but their presence in a cave collection is evidence of animal occurrence over time, not proof of a single ‘mammoth landscape’ in 31,103 BCE.

This distinction is essential when reconstructing everyday life. We can reasonably describe wetland plants, cold-adapted animals and the processes that concentrated bones in caves. We cannot identify a camp, household, hunting party, shelter, clothing tradition or seasonal round in Ireland for this exact date. No securely excavated dwelling, hearth, stone-tool assemblage or burial from the island can presently be assigned to this point with the required confidence.

The Human Question at Castlepook

A reindeer femur from Castlepook has made this period especially significant. The bone, recovered during early twentieth-century cave work, has a deep mark interpreted by researchers as a possible fresh-bone chop or cut made with a sharp stone implement during carcass processing. A radiocarbon result on the specimen has been publicised as evidence for human activity in Ireland roughly 33,000 years ago. If that interpretation is confirmed through continued microscopic study, secure dating and discovery of corroborating material in undisturbed deposits, it would extend the potential Irish human record far earlier than the better-known Late Upper Palaeolithic evidence.

But the wording must remain cautious. A radiocarbon age dates the death of the animal, not automatically the instant when a surface mark was made. A mark interpreted as human-made must also be distinguished from damage caused by carnivore teeth, sediment movement, excavation tools, weathering or other taphonomic processes. And one modified bone would demonstrate an episode of human contact with a carcass, not a settlement, population size or an enduring occupation. Castlepook is a promising and important site precisely because it preserves questions that can be tested, rather than a licence to fill the evidential gaps with imagined Ice Age communities.

No Politics, but a Changing World

There is no evidence for political affairs, diplomacy, named groups, organised warfare, religion, formal learning, trade networks or artistic traditions in Ireland at this date. These are not missing chapters awaiting a written source; they are categories that the surviving evidence cannot responsibly sustain. It would be misleading to project later tribal identities, Gaelic language, farming society, monuments or Irish kingdoms backwards over more than thirty millennia.

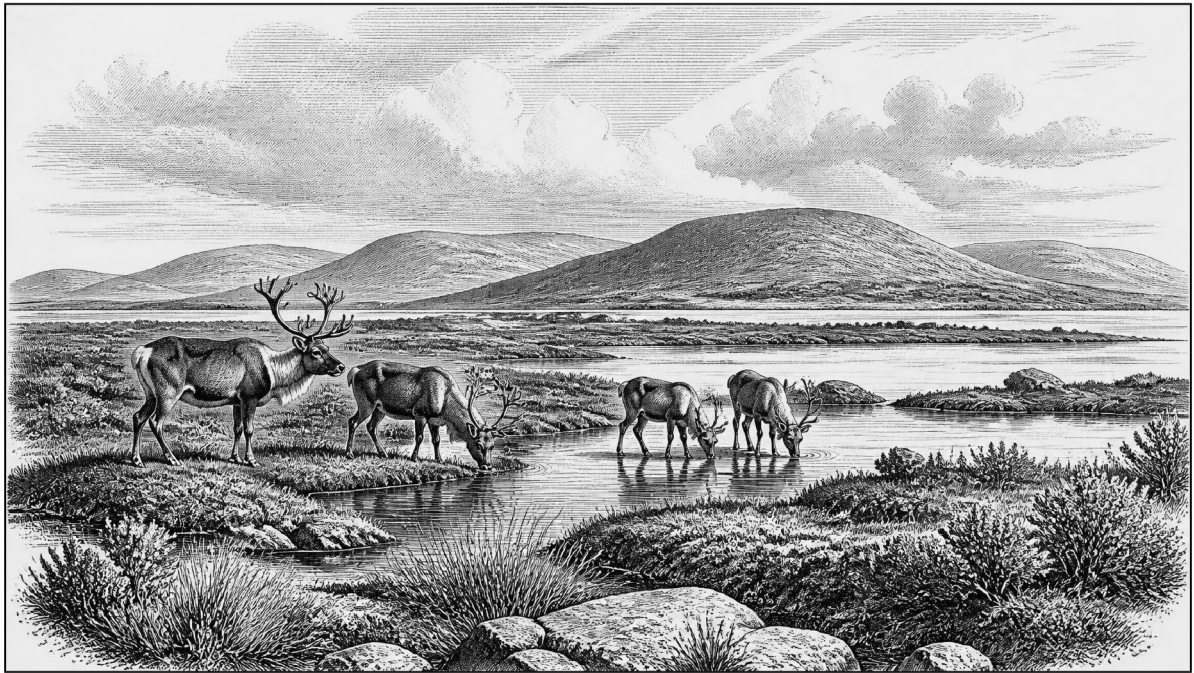
If people did visit during a favourable interval, their social world would have been that of mobile Upper Palaeolithic hunter-gatherers known elsewhere in Europe, but this is an external comparison rather than direct Irish evidence. It can suggest possibilities—co-operation in hunting, skilled carcass processing, knowledge of seasonal animal movement and the use of stone tools—without converting them into facts about a group at Derryvree or Castlepook. No exchange of goods between communities can yet be documented from Ireland at this depth of time.

The principal Irish development relevant to 31,103 BCE was environmental rather than political: the persistence, for part of a dated range, of habitable cold-stage ground between glacial episodes. Derryvree preserves its quiet consequence in silt, seeds and mosses. Castlepook preserves a complementary record of animals, carnivores and a debated possible human intervention. Together they replace the old image of an empty, uniformly ice-covered island with a more rigorous one: a changing Pleistocene terrain whose rare records reveal ecological opportunity, but whose chronology does not permit the certainty of a single year.

Chapter 099 of 100

31102 BCE

Hyaena Hall's Deep Archive^[99]



31,102 BCE is not a year that can be recovered from the Irish archaeological record. It is a modern calendar label, roughly 33,050 years before the conventional radiocarbon reference point of AD 1950. No written calendar, annual layer, named community or datable event permits a history of twelve particular months. The responsible setting is instead a broad Late Pleistocene horizon in the latter part of Marine Isotope Stage 3 (MIS 3), during the last Ice Age. Evidence consists of radiocarbon ranges, sediments, cave bones and glacial landforms; interpretation must remain separate from what those traces directly prove.

This notional date falls within a period when Ireland's environments were cold, volatile and regionally varied, before the fullest expansion of the last British–Irish Ice Sheet. The global Last Glacial Maximum came later, conventionally placed at about 26,500–19,000 years ago. Ireland was therefore not simply a uniformly ice-covered island at this point, but neither was it a familiar green landscape awaiting settlement. Ice margins, open ground, wetlands, river valleys, limestone caves and changing coastlines created a shifting north-western edge of Ice-Age Europe.

A Date Range, Not an Anniversary

Deep-time chronology demands care. Radiocarbon laboratories measure the remaining carbon-14 in once-living material, producing a radiocarbon age rather than an immediately usable calendar year. That age must be calibrated against independently dated records of past atmospheric carbon variation. For samples more than thirty millennia old, the resulting calendar ranges can be broad. Nor does a date on a bone automatically date every animal bone, sediment layer or possible human action nearby.

The key Irish comparison is Derryvree, near Maguiresbridge in County Fermanagh. Roadworks exposed freshwater silts, sands and organic material trapped between two tills: deposits laid down by glacier ice. The sequence provides a clear relative order. Ice formed the lower till; an interval without glacier ice at that locality allowed waterborne and organic sediments to accumulate; then renewed glaciation buried them beneath the upper till. Organic material from the inter-till deposits returned a radiocarbon age of $30,500 \pm 1,200$ radiocarbon years BP, calibrated in published discussion to approximately 36,900–31,700 calendar years BP.

The nominal date of 31,102 BCE lies within that broad calibrated window, not at a precise point that the Derryvree deposits can identify. Converted approximately, the range spans about 34,950–29,750 BCE. It is evidence that north-central Ireland contained an ice-free freshwater environment during part of that long interval. It is not proof that all Ireland was ice-free, that conditions were identical from Fermanagh to Cork, or that a particular season can be reconstructed for this article's calendar label.

Wetlands Between the Ice

Derryvree matters because it preserves living conditions rather than only the destructive work of ice. Its plant remains indicate open, cold-stage vegetation around standing or slow-moving freshwater. Sedges, aquatic plants, mosses and low-growing tundra or marsh vegetation point to a landscape without closed forest. Such evidence supports an environment of wet hollows and shallow pools amid exposed ground, with local shelter and water even in a generally severe climate.

This was not a stable countryside. The North Atlantic climate of MIS 3 experienced abrupt shifts between relatively milder interstadials and colder stadials, known especially from Greenland ice cores. Irish deposits record the consequences only indirectly and at lower resolution. They should not be assigned confidently to every named Greenland climatic oscillation. What can be said is that the island's ice, vegetation, drainage and animal habitats changed repeatedly over millennia. At Derryvree, freshwater life survived long enough to leave a delicate archive before advancing ice sealed it away.

Nearby evidence at Greenagho, also in County Fermanagh, includes organic lacustrine deposits beneath till dated to about 37,200–35,700 calibrated years BP. Together, Derryvree and Greenagho show that the advance towards full glaciation was neither instantaneous nor simple. They illuminate a northern interior with habitable patches during parts of MIS 3, while saying little about exactly how far people, if any were present, could have travelled through it.

Castlepook's Animal World

County Cork provides the other major Irish archive relevant to this period. Castlepook Cave, also called Mammoth Cave or Doneraile Cave, lies in the limestone country of the Awbeg valley. Excavations and collecting there, much of it undertaken before modern archaeological standards, produced an exceptional Pleistocene faunal assemblage. Reindeer, woolly mammoth, giant deer, brown bear, wolf, fox, Arctic fox, mountain hare, lemmings and spotted hyaena are among the animals identified from the cave system.

This is not a census of creatures sharing the landscape in 31,102 BCE. Cave deposits can accumulate slowly; carnivores carry bones into dens; water and sediment move material; and older excavation practices often left imperfect records of context. Modern radiocarbon reassessment has also shown that

some Castlepook specimens previously thought much younger were substantially older, strengthening the case that important elements of the assemblage belong to MIS 3. Each specimen must therefore be considered on its own date, condition and find history.

Even with those cautions, Castlepook establishes the broad ecological character of southern Ireland during portions of the period. Reindeer, mammoth and giant deer indicate open country capable of supporting large herbivores. Lemmings and Arctic fox reinforce the cold-climate signal. Spotted hyaena is particularly striking: this species ranged far beyond modern Africa during the Pleistocene and could live in cold, open settings. Bones bearing hyaena damage also show that a cave may have been a den and scavenging place, rather than a human shelter.

The giant deer is often called the “Irish elk”, but that familiar name misleads. *Megaloceros giganteus* was neither an elk nor an animal restricted to Ireland; it ranged widely across Eurasia. Its presence at Castlepook is important not as a national emblem, but as evidence for the wide ecological connections that linked Ireland to continental and British Ice-Age faunas when routes of dispersal were intermittently available.

The Human Question

There is no securely excavated camp, hearth, dwelling floor, human bone or unequivocal stone-tool assemblage in Ireland dating to around 31,102 BCE. Accordingly, no responsible account can describe an Irish population, political order, conflict, diplomacy, trade network, ritual tradition or language for this time. There is equally no direct evidence for farming, permanent settlement, boat-building, art or formal learning on the island at this date.

A reindeer femur from Castlepook has nevertheless made the cave central to debate. A mark on the bone has been interpreted as a fresh-bone cut or chop made with a sharp stone implement during carcass processing. If that interpretation, its chronology and its context are ultimately sustained, it could represent remarkably early human handling of an animal in Ireland. It would suggest a brief Upper Palaeolithic visit by mobile hunter-gatherers rather than a demonstrated resident society.

That conclusion remains provisional. The bone comes from a complicated old collection, not a modernly excavated occupation surface. A cut-like mark is not by itself a settlement, and the age of an animal does not demonstrate that people were present when it died. Recent work at Castlepook has sought surviving undisturbed sediments and improved contextual evidence, precisely because fresh excavation, microscopic analysis and secure dating are needed to test such a consequential claim.

The contrast with later evidence is instructive. A butchered brown-bear patella from Alice and Gwendoline Cave in County Clare has been independently dated to about 12,810–12,590 calibrated years BP, providing strong evidence of Late Upper Palaeolithic human activity long after the period considered here. The first clear sustained settlement evidence belongs later again, to Early Mesolithic communities after the final retreat of the ice. The gap is not an invitation to invent a lost Ice-Age Ireland; it is a measure of what remains unknown.

Mobility Without Borders

At this depth of time, Ireland had no political geography. There were no Irish kingdoms, territorial boundaries or diplomatic relations in the historical sense. Yet the animals in the cave record demonstrate that the island was part of a wider zone of movement. Lower global sea levels altered the surrounding

shelf, but sea level alone did not create a simple, permanent land bridge. Ice barriers, local relative sea-level change, shifting coastlines and the changing configuration of Britain and the Irish Sea all affected access.

For large mammals, successful movement depended on viable habitat as much as dry ground: forage, freshwater, seasonal shelter and routes around ice. The presence of a varied cold-stage fauna shows that such opportunities existed at intervals. Whether people exploited the same routes in MIS 3 is a separate archaeological question. Comparable hunter-gatherer societies elsewhere in Upper Palaeolithic Europe certainly possessed sophisticated knowledge of animals, stone and seasonal landscapes, but it would be speculation to transfer their social arrangements wholesale to Ireland without an Irish settlement record.

An Archive of Change

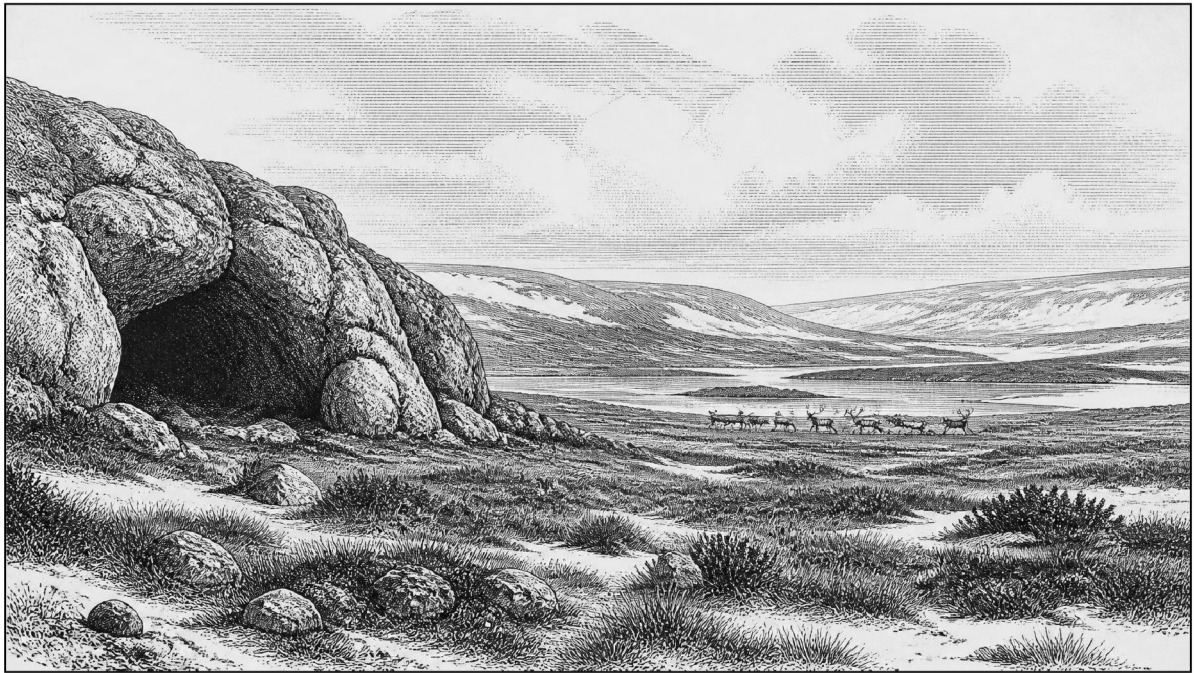
The most important development around this nominal date was environmental, not political: the approach of a more extensive glaciation across a landscape that still contained local freshwater habitats and mobile animal populations. Derryvree records an ice-free wetland interval in Fermanagh. Castlepook records a far-ranging cold-stage fauna in Cork, accumulated over a long and complicated timespan. Together they replace the crude picture of an island either wholly frozen or fully occupied.

They also set strict limits on historical imagination. Around 31,102 BCE, Ireland can be described as an unstable Ice-Age landscape of open vegetation, freshwater pockets, large herbivores, predators and advancing ice. A human visit is possible but unproven for this precise horizon. There were no recoverable affairs of state, no established Irish society and no annual narrative. What survives is deeper and more fragmentary: silt between tills, teeth and bones in limestone darkness, and a landscape repeatedly remade by ice.

Chapter 100 of 100

31101 BCE

The Castlepook Threshold ^[100]



The label 31,101 BCE suggests a precision that the evidence cannot sustain. Nobody in Ice-Age Ireland used a calendar, and archaeology cannot identify an event, a person or even a particular season in that numbered year. In modern arithmetic it falls about 33,050 years before AD 1950, the conventional origin of “before present” dating. It belongs broadly to the later part of Marine Isotope Stage 3, a volatile phase of the last glacial period. The appropriate history is therefore one of calibrated ranges, deposits and changing environments, not an invented annual chronicle.

That distinction matters especially in Ireland. Later glaciers eroded, buried and rearranged much of the older landscape. The surviving record for this remote interval consists chiefly of animal bones, cave sediments, pollen and plant remains in scattered deposits, glacial landforms, and the results of modern re-dating. These sources can illuminate a cold, open and ecologically connected island. They cannot demonstrate an Irish nation, settlement system or political event in 31,101 BCE.

A Landscape in Transition

Ireland at this time was within the long cold phase conventionally called the Midlandian in Irish Quaternary studies. It was not simply a country locked under one unchanging blanket of ice. Climate across the North Atlantic swung abruptly between colder stadials and comparatively milder interstadials. Greenland ice-core chronologies provide the most detailed framework for those shifts, but correlation from Greenland to an individual Irish valley is necessarily interpretative rather than exact. Around the early thirties of millennia BCE, temperatures, snowfall, vegetation and ice margins could alter substantially over centuries or millennia.

Recent reconstruction of the British–Irish Ice Sheet emphasises that its growth was uneven in time and place. By about 31,000 years ago, ice was building in northern sectors and high ground, while the geographical evidence for the precise limits of Irish ice remains sparse. The fully developed maximum came later, not at one simultaneous moment everywhere. For Ireland around the date considered here, the defensible picture is a patchwork: expanding upland and regional ice, periglacial ground beyond it, and pockets of open country capable at times of supporting grazing animals. It is unsafe to colour the whole island either ice-free or fully ice-covered on the basis of one date.

Sea level was lower than it is today, exposing parts of the continental shelf and changing the shape of coasts and sea crossings. Yet lower seas do not automatically prove a dry land bridge between Ireland and Britain. The precise routes available to animals or people varied with local topography, water depth, ice, tides and climate. The animal record does show that Ireland was not biologically isolated throughout the glacial period: mammals repeatedly reached it from the wider north-west European world. How each species crossed remains a question of palaeogeography, not something that can be read directly from a cave bone.

Castlepook's Long Bone Record

The most important Irish locality for this broad period is Castlepook Cave, near Doneraile in north County Cork, in the Awbeg valley beneath the Ballyhoura foothills. Excavations between 1904 and 1918 recovered a large and extraordinarily mixed assemblage from its narrow passages and chambers, including places named Hyaena Hall and Elephant Hall. Geological Survey Ireland describes it as the country's richest source for vertebrate fauna before the Last Glacial Maximum. More than 2,000 bones have been recovered, with individual radiocarbon results spanning roughly 45,700 to 19,950 radiocarbon years before present. That is a valuable archive, but it is emphatically not a single, undisturbed moment in time.

Its fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena; later elements include wolves, Arctic foxes and lemmings. These remains establish that cold-adapted and open-country mammals reached Ireland during the middle and later stages of the Ice Age. They do not prove that every listed animal shared the same valley or season. Bone accumulations in caves may result from carnivores, natural deaths, water movement, sediment collapse and human excavation practices as well as from any human activity. Castlepook was a repository repeatedly altered over tens of thousands of years, not an Ice-Age village preserved beneath a floor.

Modern re-dating has increased the need for caution. Ruth Carden's reassessment found that some earlier determinations from Castlepook and other southern Irish caves were substantially too young, in some cases by thousands of radiocarbon years. The reassessment supports a deeper Marine Isotope Stage 3 history for parts of the fauna and suggests that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum, around 40,000 calibrated years before present. Scientific improvement has thus made the record older and more interesting, while making simple narratives less secure.

The Marked Reindeer Femur

One Castlepook object gives this approximate year exceptional importance: a reindeer femur bearing a deep incision interpreted by zooarchaeologist Ruth Carden as a cut made by a sharp stone tool during carcass processing. County Cork heritage material catalogues the bone as c. 31,000 BC and presents it as potential evidence of Palaeolithic hunters. Public reporting has also described it as about 33,000 years old.

Those shorthand expressions should not be treated as a precise calibrated calendar date or as proof of a particular day's hunt. Radiocarbon ages require calibration against a curve such as IntCal20, and the resulting calendar estimate is a probability range rather than a point.

The incision and the date answer different questions. If the mark is genuinely a stone-tool cut and belongs to the same period as the bone, it indicates that a person used a sharp implement on a reindeer carcass in Ireland during the broad earlier Upper Palaeolithic. It does not reveal whether the animal was hunted or scavenged, whether meat, hide, sinew or marrow was sought, or whether the cutting happened at the cave. Carnivores could subsequently have carried a portion of the carcass into Castlepook. Nor has the cave yielded a securely associated hearth, stone-tool assemblage, dwelling surface, human burial or repeated food-processing area of comparable age.

It would therefore be misleading to announce a settled population, a tribe or an established Irish hunting territory. The most that can responsibly be inferred is the possibility of a brief visit by one or more highly mobile hunter-gatherers. Such people, if present, would have belonged to wider Upper Palaeolithic networks in north-west Europe, but Ireland has not produced the artefacts needed to assign them a named archaeological culture. The reindeer bone is an important proposed trace of human action; it is not a constitution for prehistoric Ireland.

Life Without a Social Record

There is no evidence from this period for political institutions, rulers, diplomacy, territorial boundaries or organised warfare in Ireland. Nor can religion, language, kinship rules, music, art or formal learning be recovered from the Castlepook material. Upper Palaeolithic communities elsewhere in Europe made sophisticated stone tools, ornaments and images, but those continental achievements must not be imported into Ireland without Irish evidence.

Everyday life can only be approached conditionally. If hunters reached Ireland, they probably travelled in very small groups, carried portable equipment, relied on fire and clothing, and moved according to weather and animal opportunity. Reindeer would have supplied meat and potentially hide, bone and sinew; other large mammals represented resources but also danger. Such possibilities are grounded in hunter-gatherer practice elsewhere, not demonstrated by a domestic camp at Castlepook. There is no basis for farming, livestock keeping, permanent houses, pottery, metalworking, markets or regular trade within Ireland at this date.

The island's real economy was ecological. Open herb-rich ground, grasses, sedges, dwarf shrubs and scattered cold-tolerant vegetation could support herbivores; predators and scavengers followed them. Wet patches, streams and cave entrances created local contrasts within a generally cold and exposed world. Faunal evidence indicates connection to Eurasian ranges, while the absence of a broad artefact record suggests that any human use of the island was intermittent or has been lost to erosion and later ice. Both explanations may be relevant, but neither converts silence into certainty.

What This Year Can Mean

The strongest history of 31,101 BCE is consequently one of thresholds. Ireland was approaching the great expansion of the British–Irish Ice Sheet, yet parts of its landscape could still sustain a remarkable cold-stage fauna. Castlepook preserves evidence of mammoth, reindeer, giant deer, bear, wolf and hyaena across a long interval of climatic instability. Its marked reindeer femur raises the consequential possibility

that people reached the island far earlier than the securely established terminal-Pleistocene evidence from Alice and Gwendoline Cave in County Clare, where a butchered bear patella has calibrated ranges of 12,810–12,590 and 12,810–12,685 years before present.

But the lesson is methodological as well as dramatic. A single mark is evidence to be tested, not a licence to populate the island with imagined camps. Around this notional year, Ireland has no written politics and no calendar history. It has a changing Ice-Age environment, an uneven fossil record, a cave archive disturbed over long periods, and one provocative object at the edge of what can presently be said. That is limited evidence, but it is enough to make the Castlepook threshold central to the deepest history of human possibility in Ireland.



About the Author

Gerard J. Hannan is an Irish author, historian, journalist and broadcaster with a lifelong interest in the people, places and events that have shaped Ireland's past. Based in Limerick, he spent more than twenty-five years working in journalism and broadcasting, developing a particular interest in local history, social change and the preservation of historical memory.

He is the founder and curator of Emerald Archives, an expanding digital historical collection dedicated to preserving, restoring and sharing material connected with Ireland's social, cultural and political history. Through the archive and its associated publishing projects, he aims to make historical information accessible to both general readers and serious researchers.

Hannan holds a BA in History and Media, a Master of Business Studies in International Entrepreneurship Management, and an MA in Teaching English to Speakers of Other Languages. His academic background complements decades of practical experience in writing, research, broadcasting and historical documentation.

He is also the author of several books and long-form historical projects exploring Irish life, identity and memory. As creator of Emerald Gazette, Hannan continues to develop a growing chronological collection designed to bring Ireland's extraordinary historical record to a broad international readership.

Endnotes

1. Chapter 001 — Derryvree Beneath the Drumlin (31200 BCE). Sources: References 2, 20, 38, 58, 95, 106, 136, 150, 176, 182, 228, 235, 245, 337, 352, 362, 382–383, 387, 391.
2. Chapter 002 — Derryvree’s Periglacial Record (31199 BCE). Sources: References 1–2, 20, 38, 56, 92, 136, 150, 207, 228, 242, 245, 251, 303–304, 311, 337, 362, 382–383, 391.
3. Chapter 003 — BIRM-166’s Waterlogged Tundra (31198 BCE). Sources: References 21, 39, 41, 78, 84, 121–122, 137–138, 150, 177, 213, 215, 229, 242–243, 256, 267, 307, 363, 382, 392.
4. Chapter 004 — Derryvree’s Bogbean Pool (31197 BCE). Sources: References 2, 20, 33, 36, 58, 84, 128, 139, 162, 167, 191, 213, 245, 248, 251, 263, 281, 289, 299, 306, 311, 362, 382, 391.
5. Chapter 005 — Crag Cave’s Flowstone Record (31196 BCE). Sources: References 20, 58, 61, 140, 150, 174, 219, 228, 245, 252, 262, 278, 309, 352, 364, 366, 377, 382, 384, 392.
6. Chapter 006 — The Castlepook Femur Inquiry (31195 BCE). Sources: References 2, 33, 35, 38, 120, 136, 150, 173, 183, 208, 213, 219, 229, 234, 245, 264, 279, 306, 323, 363, 382, 391.
7. Chapter 007 — A Reindeer at Doneraile (31194 BCE). Sources: References 116, 120–121, 123, 150, 156, 173, 217, 228, 230, 242, 245, 293, 299, 308, 346, 350, 353, 363–364, 382, 400.
8. Chapter 008 — Mammoths Above the Awbeg (31193 BCE). Sources: References 16–17, 21, 33, 38, 42, 79, 95, 111, 150, 192, 215, 228, 278, 352, 362, 382–383, 388, 391.
9. Chapter 009 — Cork’s Deep Bone Question (31192 BCE). Sources: References 38, 120, 150, 157, 164, 173, 208, 228, 230, 239, 243, 249, 262, 269, 294, 350, 354, 363, 382, 385.
10. Chapter 010 — Derryvree’s Freshwater Ledger (31191 BCE). Sources: References 20, 38, 64, 89, 93, 136, 150, 155, 178, 184, 192, 215, 228, 245, 269, 278, 315, 338, 352, 362, 389, 391.
11. Chapter 011 — Derryvree’s Willow Marsh (31190 BCE). Sources: References 8, 21, 30, 141, 150, 185, 219, 229, 231, 238, 243, 245, 257, 266, 352, 355, 363–364, 369, 379, 382, 392.
12. Chapter 012 — Maguiresbridge’s Organic Bed (31189 BCE). Sources: References 2, 6, 20, 38, 52, 79, 106, 136, 153, 176, 186, 207, 219, 228, 235, 240, 245, 312, 328, 364, 386, 391.
13. Chapter 013 — Blackwater Limestone Fauna (31188 BCE). Sources: References 21, 33, 58, 65, 67, 75, 78, 142, 150, 162, 173, 177, 229, 239, 325, 363, 382, 392, 397, 400.
14. Chapter 014 — Mammoth Cave Hindleg (31187 BCE). Sources: References 40, 58, 69, 73, 78, 119, 122, 141, 150, 167, 173, 185, 191, 204, 208, 239, 251, 355, 364, 377, 382, 392.
15. Chapter 015 — Derryvree’s Three-Leaved Fossil (31186 BCE). Sources: References 2, 13, 21, 36, 38, 78–79, 104, 150, 189, 228, 245, 256, 272, 301, 303, 363, 373–374, 382.
16. Chapter 016 — BIRM-166’s Intertill Testimony (31185 BCE). Sources: References 20, 33, 56, 59–60, 62, 79, 89, 173, 187, 228, 242, 245, 294, 316, 352, 363, 382–383, 391.
17. Chapter 017 — Maguirebridge’s Moss-Rich Interval (31184 BCE). Sources: References 10, 20, 39, 78, 92, 118, 123, 143, 185, 191, 228, 235, 245, 283, 316, 319, 364, 384, 392, 397.
18. Chapter 018 — Derryvree’s Open Fen (31183 BCE). Sources: References 21, 33, 39, 75, 91–92, 124, 128, 136, 150, 185, 191, 228, 235, 270, 297, 311, 337, 355, 364, 382, 392.
19. Chapter 019 — Aghnadarragh’s Mammoth Gravel (31182 BCE). Sources: References 16, 20, 33, 78, 95, 120, 125, 128, 136, 141, 173, 177, 185, 191, 228, 243, 256, 269, 293, 363, 380, 382.
20. Chapter 020 — Maguirebridge’s Freshwater Interlude (31181 BCE). Sources: References 20–21, 38, 40, 79, 96, 138, 150, 155, 175, 179, 188, 213, 228, 240, 309, 315, 352, 355, 362–363, 383, 388.

- 21.** Chapter 021 — Cork's Pleistocene Reindeer (31180 BCE). Sources: References 13, 38, 58, 93, 144, 150, 168, 192, 215, 235, 239, 245, 262, 268, 295, 352, 354, 362, 372, 382, 391.
- 22.** Chapter 022 — Derryvree's Intertill Ecosystem (31179 BCE). Sources: References 11, 33, 36, 39, 79, 106, 118, 136, 160, 193, 207, 210, 215, 228, 245, 263, 316, 352, 362, 367, 388, 392.
- 23.** Chapter 023 — Derryvree's Sealed Waters (31178 BCE). Sources: References 13, 21, 27, 39, 80, 150, 162, 185, 190, 208, 214, 228, 242, 262, 285, 334, 354, 356, 363, 382.
- 24.** Chapter 024 — Derryvree's Periglacial Marsh (31177 BCE). Sources: References 2, 13, 20, 38, 78, 117, 136, 142, 150, 173, 211, 219, 228–229, 242, 245, 251, 280, 316, 335, 363, 378, 382, 388.
- 25.** Chapter 025 — Castlepook's Spotted Hyena (31176 BCE). Sources: References 2, 20, 33, 58, 88, 105, 117, 136, 176–177, 220, 228, 235, 242, 245, 251, 268, 312, 316, 352, 354, 364, 382, 391.
- 26.** Chapter 026 — BIRM-166's Treeless Interval (31175 BCE). Sources: References 2, 21, 36, 39, 122, 128, 176, 210, 216, 228, 235, 263, 283, 311, 329, 336, 364, 382, 388, 392.
- 27.** Chapter 027 — Castlepook's Reindeer Problem (31174 BCE). Sources: References 2, 20, 33, 37, 79, 93, 95, 128, 136, 141, 150, 169, 173, 215, 228, 262, 287, 311, 348, 352, 362, 378, 382.
- 28.** Chapter 028 — The Awbeg Reindeer Enigma (31173 BCE). Sources: References 12, 16, 21, 33, 40, 51, 58, 78, 93, 120, 170, 173, 208, 219, 228, 234–235, 243, 262, 269, 274, 293, 365, 382, 400.
- 29.** Chapter 029 — Awbeg Before the Ice (31172 BCE). Sources: References 39, 66, 73, 78, 93, 124, 137, 142, 167, 185, 191, 210, 245, 256, 316, 326, 355, 364, 366, 377.
- 30.** Chapter 030 — Derryvree's Thirty-Thousand-Year Mud (31171 BCE). Sources: References 1–2, 21, 58, 75, 78, 120, 177, 197, 208, 228–229, 263, 269, 277, 298, 304, 363, 373, 380, 382, 392.
- 31.** Chapter 031 — Ireland's Ice-Sheet Build-Up (31170 BCE). Sources: References 24, 38, 50, 79, 103, 123, 136, 150, 191, 199, 207, 228, 237, 263, 268, 272, 326, 328, 352, 364, 382, 398.
- 32.** Chapter 032 — Derryvree's Two-Till Silence (31169 BCE). Sources: References 2, 36, 39, 91, 96, 99, 111, 150, 165, 213, 215, 232, 242, 251, 271, 352, 354, 362, 382, 392, 395.
- 33.** Chapter 033 — Fermanagh's Last Open Wetland (31168 BCE). Sources: References 20, 36, 58, 79, 107, 113, 126, 137, 167, 192, 228, 245, 264, 271, 278, 280, 297, 316, 337, 352, 354, 362, 392.
- 34.** Chapter 034 — Derryvree's Calendarless Wetland (31167 BCE). Sources: References 21, 33, 40, 43, 78, 96, 122, 125, 191, 208, 218, 228, 235, 243, 251, 309, 316, 326, 330, 357, 365, 392.
- 35.** Chapter 035 — Castlepook's Possible Butchery (31166 BCE). Sources: References 2, 37–38, 42, 52, 56, 58, 123, 136, 150, 179, 228, 242, 268, 310, 312, 328, 352, 363, 391.
- 36.** Chapter 036 — Castlepook's Earliest Claim (31165 BCE). Sources: References 2, 20, 38, 58–59, 111, 115, 121–123, 136, 150, 169, 209, 228, 235, 293, 319, 362, 382–383, 386.
- 37.** Chapter 037 — Hyenahall's Long Bone Record (31164 BCE). Sources: References 2, 21, 36, 58, 78, 114, 141, 150, 173, 183, 185, 191, 229, 245, 283, 316, 347, 363, 388, 392.
- 38.** Chapter 038 — Cork's Earliest Butchery Debate (31163 BCE). Sources: References 20, 48, 74, 79, 87, 95, 117, 137, 169, 188, 192, 228, 236, 245, 274, 278, 284, 302, 362, 378, 383, 402.
- 39.** Chapter 039 — BIRM-166's Closing Waters (31162 BCE). Sources: References 20, 33, 38, 80, 95, 117, 122, 167–168, 185, 228, 242, 245, 264, 318, 328, 346, 364, 382, 391, 401.
- 40.** Chapter 040 — Derryvree's Sedge Horizon (31161 BCE). Sources: References 2, 20, 36, 38, 48, 68, 93, 102, 122, 128, 134, 136, 150, 215, 228, 248, 251, 262, 346, 362, 382–383.
- 41.** Chapter 041 — Derryvree's Intertill Exposure (31160 BCE). Sources: References 20, 33, 95, 106, 128, 150, 161–162, 170, 200, 221–222, 228, 245, 256, 268–269, 271, 337, 362, 382–383.

- 42.** Chapter 042 — Maguirebridge's Fading Wetlands (31159 BCE). Sources: References 2, 33, 61, 78, 122–123, 148, 150, 208, 228, 247, 265, 276, 312, 356–357, 364, 377, 382, 392.
- 43.** Chapter 043 — Rangifer at Mammoth Cave (31158 BCE). Sources: References 2, 21, 33, 36–37, 58, 89, 96, 108, 150, 228, 235, 245, 251, 262, 311, 364, 375, 382, 391.
- 44.** Chapter 044 — The Maguiresbridge Silt Bed (31157 BCE). Sources: References 2, 20, 27, 38, 53, 73, 80, 96, 136, 150, 162, 167, 177, 219, 229, 242, 280, 313, 352, 354, 363, 377, 382, 391.
- 45.** Chapter 045 — The Doneraile Reindeer Incision (31156 BCE). Sources: References 4, 16, 38, 129, 136, 150–151, 157, 173, 178, 192, 202, 228, 242, 315, 317, 328, 339, 352, 362, 387, 391.
- 46.** Chapter 046 — Castlepook at the Ice Threshold (31155 BCE). Sources: References 2, 33, 39, 135, 143, 150, 203–204, 228–229, 235–236, 245, 257, 290, 296, 358, 362, 382, 392.
- 47.** Chapter 047 — Derryvree's Waterlogged Witness (31154 BCE). Sources: References 20, 33–34, 36, 58–59, 96, 111, 121, 123, 152, 228, 235, 245, 253, 262–263, 325, 327, 330, 382, 392.
- 48.** Chapter 048 — BIRM-166's Buried Ecosystem (31153 BCE). Sources: References 2, 20, 38, 53, 55, 58–59, 69, 92, 136, 178, 203, 206, 228, 245, 262, 321, 352, 354, 364.
- 49.** Chapter 049 — Maguirebridge's Tundra Pool (31152 BCE). Sources: References 20, 33, 38, 58–59, 76, 95, 106, 123, 128, 136, 180, 228, 245, 311, 333, 352, 362, 372, 382.
- 50.** Chapter 050 — Bogbean Under Fermanagh (31151 BCE). Sources: References 9, 20, 39, 81, 84, 107, 113, 149, 151, 188, 194, 213, 223, 228, 245, 258, 282, 322, 352, 362, 369, 382, 392, 399.
- 51.** Chapter 051 — Derryvree's Tundra Threshold (31150 BCE). Sources: References 33, 36, 38, 84, 137, 150, 183, 207, 213, 224, 228, 240, 245, 251, 278, 315, 328, 362, 366, 378.
- 52.** Chapter 052 — Menyanthes Under the Drumlin (31149 BCE). Sources: References 2, 21, 33, 40, 58–60, 88, 111, 116, 120, 122, 219, 228, 262, 269, 308, 351, 358, 364, 381–382.
- 53.** Chapter 053 — Doneraile's Reindeer Lair (31148 BCE). Sources: References 14, 20, 54, 96, 112, 123, 131, 136, 150, 167, 173, 228, 242, 286, 293, 318, 327, 362, 383, 395, 398.
- 54.** Chapter 054 — The Fermanagh Herbarium (31147 BCE). Sources: References 2, 21, 33, 44, 58–59, 69, 92, 136, 138, 150, 177, 216, 228, 242, 251, 312, 354, 363, 382, 393.
- 55.** Chapter 055 — Cave Hyenas at Castlepook (31146 BCE). Sources: References 27, 33, 88, 106, 169, 177, 207, 235, 242–243, 245, 263, 278, 301, 311, 352, 354, 362, 372, 382, 388, 394.
- 56.** Chapter 056 — Derryvree's Muskeg Flora (31145 BCE). Sources: References 5, 20, 38, 84, 102, 141, 150, 161–162, 166, 177, 207, 213, 217, 219, 228, 233, 245, 299, 315, 352, 354, 364, 383.
- 57.** Chapter 057 — Maguirebridge's Sealed Wetland (31144 BCE). Sources: References 2, 12, 22, 33, 40, 150, 173, 177, 210, 219, 229, 245, 256, 273, 283, 296, 306, 355, 361, 364, 382, 390.
- 58.** Chapter 058 — Cork's Pre-Ice Reindeer Cutmark (31143 BCE). Sources: References 20, 38, 79, 95, 136, 150, 192, 197, 207, 228, 240, 245, 259, 286–287, 328, 352, 364, 383, 387, 391.
- 59.** Chapter 059 — BIRM-166's Arctic Pools (31142 BCE). Sources: References 2, 20, 38, 53, 58, 93, 96, 136, 150, 177, 229, 245, 262, 326, 353–354, 364, 382, 385, 391.
- 60.** Chapter 060 — The Maguiresbridge Road Section (31141 BCE). Sources: References 2, 20, 38, 52, 58, 93, 128, 130, 136, 173, 200, 219, 228, 244, 254, 277, 352, 362, 368, 382.
- 61.** Chapter 061 — Mammoths and Muskeg (31140 BCE). Sources: References 1–2, 20, 36, 39, 57, 61, 150, 157, 170, 174, 177, 203, 229, 237, 242, 245, 249, 265, 314, 349, 352, 363, 392.
- 62.** Chapter 062 — Derryvree's Cold-Stage Flora (31139 BCE). Sources: References 2, 21, 33, 38, 59, 77, 79, 95, 106, 189, 192, 203, 228, 235, 262, 268, 291, 294, 316, 362, 391, 398.

- 63.** Chapter 063 — Castlepook’s Single Cutmark (31138 BCE). Sources: References 2, 16, 21, 38, 93, 95, 123, 136, 150, 167, 228, 245, 256, 267, 310, 320, 328, 348, 352, 362, 377, 382.
- 64.** Chapter 064 — Derryvree’s Mountain-Avens Bed (31137 BCE). Sources: References 2, 21, 36, 39, 75, 80, 84, 109, 114, 132, 150, 185, 191, 213, 216, 229, 245, 276, 363, 382, 388.
- 65.** Chapter 065 — Cork’s Lost Hyena Range (31136 BCE). Sources: References 10, 20, 33, 36, 38, 45, 79, 145, 162, 183, 207, 228, 235, 304, 312, 345, 352, 363, 382–383, 389, 391.
- 66.** Chapter 066 — Bogbean and Bone (31135 BCE). Sources: References 2, 26, 33, 38, 58, 93, 95, 111, 122, 128, 136, 150, 167, 188, 215, 228, 260, 310, 328, 363, 382.
- 67.** Chapter 067 — The Castlepook Incision (31134 BCE). Sources: References 2, 33, 39, 53, 58–59, 122, 125, 137, 150, 179, 191, 203, 219, 228–229, 246, 312, 345, 354–355, 363.
- 68.** Chapter 068 — Maguirebridge Before the Ice (31133 BCE). Sources: References 18, 20, 31, 33, 38, 42, 47, 120, 133, 136, 151, 191, 211, 215, 228, 242, 245, 269, 315, 352, 363, 391.
- 69.** Chapter 069 — Derryvree’s Fossil Wetland (31132 BCE). Sources: References 20, 33, 38, 76, 79, 95, 106, 123, 136, 192, 213, 228, 245, 262, 302, 328, 363, 381, 387, 391.
- 70.** Chapter 070 — Castlepook’s Hyena-Reindeer World (31131 BCE). Sources: References 32, 58, 78, 84, 93, 122, 125, 141, 143, 177, 179, 208, 213, 217, 228–229, 242, 325, 357, 363, 377, 385, 392, 396.
- 71.** Chapter 071 — Mosses Below Maguiresbridge (31130 BCE). Sources: References 16, 20, 26, 33, 36, 60, 92, 95, 99, 150, 161, 208, 219, 228, 245, 315, 364, 382–383, 391.
- 72.** Chapter 072 — A Cutmark Near Doneraile (31129 BCE). Sources: References 2, 21, 33, 39, 58, 177, 185, 228, 241–242, 262, 299, 306, 331, 354, 358, 363, 377, 382, 392.
- 73.** Chapter 073 — Sedges Beneath Maguiresbridge (31128 BCE). Sources: References 2, 20, 52, 56, 93, 106, 117, 136, 150, 173, 213, 215, 228, 243, 245, 278, 281, 324, 335, 352, 354, 362, 388, 391.
- 74.** Chapter 074 — Hyenahall’s Fanged Archive (31127 BCE). Sources: References 43, 58, 85, 94, 111, 177, 198, 208, 213, 216, 228, 253, 262, 271, 290, 311, 346, 358, 364, 375, 382, 392.
- 75.** Chapter 075 — Fermanagh’s Wetland Interlude (31126 BCE). Sources: References 20, 38, 54, 58, 84, 102, 106, 128, 136, 162, 177, 213, 215, 219, 228, 243, 274, 299, 315, 364, 373, 382, 391.
- 76.** Chapter 076 — Cork Reindeer, Fermanagh Sedges (31125 BCE). Sources: References 16, 21, 26, 28, 33, 39, 58, 150, 157, 167, 173, 189, 216, 219, 230, 242, 262, 268, 346, 358, 364, 382.
- 77.** Chapter 077 — BIRM-166 Between Tills (31124 BCE). Sources: References 2, 20, 33, 36, 38, 63, 82, 136, 154, 174, 177, 183, 213, 228, 235, 245, 262, 311, 352, 362, 382, 391.
- 78.** Chapter 078 — Juniper and Bogbean at Derryvree (31123 BCE). Sources: References 2, 21, 36, 58, 61, 116, 136, 150, 173, 177, 191, 208, 228, 245, 262, 309, 316, 359, 363, 390.
- 79.** Chapter 079 — BIRM-166’s Tundra Silt (31122 BCE). Sources: References 2, 20, 36, 38, 79, 123, 136, 150, 174, 195, 203, 213, 225, 228, 240, 287, 294, 306, 340, 362.
- 80.** Chapter 080 — Derryvree’s Freshwater Archive (31121 BCE). Sources: References 2, 7, 20, 23, 38, 136, 146, 150, 170, 176, 192, 196, 219, 228, 245, 263, 271, 273, 275, 364, 382, 391.
- 81.** Chapter 081 — Derryvree’s Aquatic Refuge (31120 BCE). Sources: References 2, 29, 40, 58, 84, 88, 136, 148, 167, 177, 203, 213, 217, 228, 245, 251, 299, 316, 364, 367, 377, 382.
- 82.** Chapter 082 — BIRM-166’s Sedge Basin (31119 BCE). Sources: References 2, 21, 38, 70, 72, 78, 101, 105, 128, 136, 146, 150, 204, 228, 235, 245, 262, 301, 357, 364, 373, 377, 382, 393.
- 83.** Chapter 083 — Fermanagh’s Subglacial Bogbean (31118 BCE). Sources: References 2, 20, 36, 40, 58, 80, 84, 97, 110, 150, 158, 181, 185, 191, 213, 228, 262, 300, 309, 316, 343, 360, 364, 382.

- 84.** Chapter 084 — Maguirebridge's Sedge and Sand (31117 BCE). Sources: References 2, 20, 27, 36, 38, 58, 73, 106, 117, 136, 228, 271, 312, 335, 352, 362, 378, 382, 387, 391.
- 85.** Chapter 085 — Derryvree–Castlepook Horizon (31116 BCE). Sources: References 2, 20, 58, 128, 136, 140, 150, 159, 201, 203, 217, 226, 228, 235, 262, 299, 352, 362, 376, 391.
- 86.** Chapter 086 — Derryvree, Greenagho, Castlepook (31115 BCE). Sources: References 2, 20, 38, 78, 93, 95, 136–137, 150, 170, 192, 215, 228, 245, 271, 281, 284, 352, 363, 382–383, 391.
- 87.** Chapter 087 — Derryvree's Juniper Marsh (31114 BCE). Sources: References 30, 39, 49, 80, 84, 86, 116, 150, 177, 212–213, 217, 228, 245, 253, 299, 330, 355, 363, 385, 392.
- 88.** Chapter 088 — Mammoth Cave's Questioned Cut (31113 BCE). Sources: References 2, 20, 33, 36–38, 90, 108, 117, 136, 150, 172, 205, 215, 228, 240, 245, 312, 352, 364, 369, 382, 388, 391.
- 89.** Chapter 089 — The BIRM-166 Drumlin Cut (31112 BCE). Sources: References 2–3, 20–21, 27, 38, 62, 78, 88, 122, 136, 150, 228, 239, 245, 263, 352, 354, 357, 362–363, 391.
- 90.** Chapter 090 — Castlepook's Reindeer Window (31111 BCE). Sources: References 2, 24–25, 39, 46, 100, 123, 143, 150, 163, 227–228, 240, 245, 251, 264, 294, 315, 341, 352, 362, 392.
- 91.** Chapter 091 — BIRM-166's Mossy Pools (31110 BCE). Sources: References 2, 20, 37–38, 48, 58, 69, 84, 96, 136, 176, 213, 245, 299, 311, 352, 354, 362, 382–383.
- 92.** Chapter 092 — Maguirebridge and Mammoth Cave (31109 BCE). Sources: References 16, 20, 27, 71, 80, 96, 98, 128, 137, 155, 173, 177, 215, 221, 245, 265, 293, 311, 346, 352, 354, 363, 382, 391.
- 93.** Chapter 093 — Maguirebridge's Clubmoss Waters (31108 BCE). Sources: References 2, 20, 33, 79, 92, 106, 188, 192, 228, 242, 255, 259, 291, 305, 315, 352, 362, 387, 391, 395.
- 94.** Chapter 094 — Muskeg at Maguiresbridge (31107 BCE). Sources: References 2, 15, 20, 36, 38, 83, 123, 141, 169, 177, 180, 207, 226, 261, 303, 327, 342, 363, 382, 391.
- 95.** Chapter 095 — Fermanagh's Bogbean Interval (31106 BCE). Sources: References 2, 21, 36, 73, 96, 111, 116, 122, 136–137, 150, 183, 213, 215, 228, 256, 344, 358, 363, 377, 382, 392.
- 96.** Chapter 096 — BIRM-166's Thawwater Flora (31105 BCE). Sources: References 20, 37, 60, 71, 80, 127, 136, 147, 150, 171, 211, 242, 251, 263, 278, 327, 352, 362, 369, 382.
- 97.** Chapter 097 — Derryvree's Intertill Witness (31104 BCE). Sources: References 20, 38, 54, 58, 93, 105, 141, 150, 207, 229, 245, 251, 268, 282, 288, 352, 363, 382–383, 388.
- 98.** Chapter 098 — Derryvree's Alpine Marsh (31103 BCE). Sources: References 2, 20, 38, 58, 79, 84, 90, 95, 117, 136, 149–150, 207, 213, 228, 240, 245, 254, 325, 352, 362, 382, 391.
- 99.** Chapter 099 — Hyaena Hall's Deep Archive (31102 BCE). Sources: References 2, 19, 33, 38, 60, 122, 136, 150, 165, 203, 228, 264, 278, 292, 332, 352, 363, 369–370, 391.
- 100.** Chapter 100 — The Castlepook Threshold (31101 BCE). Sources: References 2, 4, 33, 36, 38, 44, 58, 123, 136, 150, 188, 200, 228, 240, 250, 290, 328, 357, 364, 371.

References

1. **2019:148 - Alice & Gwendoline Cave, Clare**
<https://excavations.ie/report/2019/Clare/0027706/>
2. **2022:564 – Castlepook Cave, Castlepook South, Cork**
<https://excavations.ie/report/2022/Cork/0032564/>
3. **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>
4. **A 60,000 Year Greenland Stratigraphic Ice Core Chronology**
<https://cp.copernicus.org/articles/4/47/2008/>
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**
https://nora.nerc.ac.uk/id/eprint/521184/1/Merritt%2520et%2520al%2520Text_Tables_Figure%2520Captions%2520PDF.pdf
7. **A Critical Review and Re-Investigation of the Pleistocene Deposits**
https://nora.nerc.ac.uk/id/eprint/521184/1/Merritt%2520et%2520al%2520Text_Tables_Figure%2520Captions%20PDF.pdf
8. **A Critical Review and Re-Investigation of the Pleistocene Deposits of Northern Ireland**
https://nora.nerc.ac.uk/id/eprint/521184/1/Merritt%20et%20al%20Text_Tables_Figure_Captions%20PDF.pdf
9. **A critical review and re-investigation of the Pleistocene deposits of Northern Ireland**
https://nora.nerc.ac.uk/id/eprint/521184/1/Merritt%20et%20al%20Text_Tables_Figure%20Captions%20PDF.pdf
10. **Advance and Retreat of the Marine-Terminating Irish Sea Ice Stream into the Celtic Sea During the Last Glacial: Timing and Maximum Extent**
<https://eprints.gla.ac.uk/183367/>
11. **Advance and Retreat of the Marine-Terminating Irish Sea Ice Stream into the Celtic Sea During the Last Glacial: Timing and Maximum Extent**
<https://doi.org/10.1016/j.margeo.2019.03.003>
12. **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>
13. **Advances in Irish Quaternary Studies**
<https://link.springer.com/book/10.2991/978-94-6239-219-9>
14. **Advances in Irish Quaternary Studies**
<https://researchonline.ljmu.ac.uk/14943/3/Advances%20in%20Irish%20Quaternary%20Studies.pdf>
15. **Advances in Irish Quaternary Studies**
<https://doi.org/10.2991/978-94-6239-219-9>
16. **Aghnadarragh**
<https://www.habitas.org.uk/escr/site.asp?item=1>
17. **Aghnadarragh ASSI**
<https://www.daera-ni.gov.uk/protected-areas/aghnadarragh-assi>
18. **A Lithostratigraphical Framework for Onshore Quaternary and Neogene (Tertiary) Superficial Deposits of Great Britain and the Isle of Man**
<https://webapps.bgs.ac.uk/memoirs/docs/B06831.html>
19. **A Marine Isotope Stage 4 age for Pleistocene raised beach deposits near Fethard, southern Ireland**
<https://doi.org/10.1002/jqs.2812>
20. **A Middle Midlandian Freshwater Series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland**
<https://doi.org/10.1098/rspb.1972.0018>
21. **A Middle Midlandian Freshwater Series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland**
https://www.researchgate.net/publication/252327954_A_Middle_Midlandian_Freshwater_Series_at_Derryvree_Maguiresbridge_County_Fermanagh_Northern_Ireland

22. A Middle Midlandian freshwater series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland

<https://sheffield.ac.uk/media/19279/download?attachment=>

23. An All-Ireland Quaternary Map

<https://www.gsi.ie/en-ie/publications/Pages/GSI-2015-Short-Call-Cooper-An-All-Ireland-quaternary-map.aspx>

24. Ancient Hybridization and an Irish Origin for the Modern Polar Bear Matriline

<https://doi.org/10.1016/j.j.cub.2011.05.058>

25. A new Bayesian chronology for Mesolithic occupation at Mount Sandel, Northern Ireland

<https://doi.org/10.1017/S0079497X00000373>

26. An Inter-Till Freshwater Deposit at Hollymount, Maguiresbridge, County Fermanagh

<https://www.habitas.org.uk/escr/site.asp?Item=486>

27. A North-Western Habitat: the Paleoethology and Colonisation of a European Peninsula

<https://intarch.ac.uk/journal/issue61/1/6.html>

28. A North-Western Habitat: the Paleoethology and Colonisation of a European Peninsula

<https://intarch.ac.uk/journal/issue61/1/11.html>

29. Anthropogenic Changes to the Holocene Nitrogen Cycle in Ireland

<https://pmc.ncbi.nlm.nih.gov/articles/PMC6007156/>

30. A Palaeo-Glaciological Reconstruction of the Irish Ice Sheet

https://etheses.whiterose.ac.uk/id/eprint/14933/1/489647_vol1.pdf

31. A Pliocene-Pleistocene Stack of 57 Globally Distributed Benthic $\delta^{18}\text{O}$ Records

<https://doi.org/10.1029/2004PA001071>

32. Archaeological Excavations at Killuragh Cave, Co. Limerick: A Persistent Place in the Landscape from the Early Mesolithic to the Late Bronze Age

<https://researchrepository.ucd.ie/bitstreams/0fa70d1c-1476-4f2f-b49a-7a47c83c23bc/download>

33. Archaeological Heritage of County Cork

<https://www.corkcoco.ie/sites/default/files/2023-06/archaeological-heritage-of-county-cork-2020.pdf>

34. Archaeological Survey

<https://www.archaeology.ie/about-us/what-we-do/archaeological-survey/>

35. Archaeology

<https://www.burrengeopark.ie/learn-engage/geology-of-the-burren/archaeology/>

36. Archaeology Research Excavation Grant 2022: Final Report

https://www.ria.ie/assets/uploads/2024/05/areg_2022_jennings_final_report_web_ready.pdf

37. Archaeology Research Excavation Grant Report: Castlepook Cave Project

<https://www.ria.ie/assets/uploads/2024/10/AREG-2023-Richard-Jennings.pdf>

38. A Reconsideration of the Radiocarbon Dating of the Marine Isotope Stage 3 Fauna from Southern Ireland

<https://doi.org/10.1111/bor.12451>

39. 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>

40. A Reconsideration of the Radiocarbon Dating of the Marine Isotope Stage 3 Fauna from Southern Ireland

<https://onlinelibrary.wiley.com/doi/abs/10.1111/bor.12451>

41. A Review of Research Needs in Irish Archaeology

https://www.heritagecouncil.ie/content/files/review_research_needs_irish_archaeology_2007_1mb.pdf

42. 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>

43. 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

44. A Stratigraphic Framework for Abrupt Climatic Changes During the Last Glacial Period Based on Three Synchronized Greenland Ice-Core Records

<https://www.sciencedirect.com/science/article/pii/S0277379114003485>

45. A Stratigraphic Framework for Abrupt Climatic Changes During the Last Glacial Period Based on Three Synchronized Greenland Ice-Core Records

<https://doi.org/10.1002/2014RG000482>

46. Bayesian analysis of radiocarbon dates

<https://doi.org/10.1017/S0033822200033865>

47. Bayesian Modelling the Retreat of the Irish Sea Ice Stream

<https://doi.org/10.1002/jqs.2616>

48. Behavioural Tendencies of the Last British–Irish Ice Sheet Revealed by Data–Model Comparison

<https://doi.org/10.1002/jqs.3628>

49. Behavioural tendencies of the last British–Irish Ice Sheet revealed by data–model comparison

<https://onlinelibrary.wiley.com/doi/10.1002/jqs.3628>

50. Biogeography of Ireland: Past, Present, and Future

<https://irishbiogeographicalsociety.com/pdf/OccPub2biogeographyIrelandIBS.pdf>

51. BRITICE-CHRONO: Introduction

<https://britice-chrono.sites.sheffield.ac.uk/project/introduction>

52. BRITICE-CHRONO Maps and GIS Data of the Last British-Irish Ice Sheet 31 to 15 ka

<https://doi.org/10.1594/PANGAEA.945729>

53. BRITICE-CHRONO Maps and GIS Data of the Last British-Irish Ice Sheet 31 to 15 ka

<https://doi.pangaea.de/10.1594/PANGAEA.945729>

54. 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>

55. BRITICE Glacial Mapping Project

<https://sheffield.ac.uk/geography-planning/research/geography/projects/britice>

56. British–Irish Ice Sheet and Polar Front History of the Goban Spur, Offshore Southwest Ireland Over the Last 250,000 Years

<https://doi.org/10.1111/bor.12631>

57. Brown Bear Patella Discovery in the Edenvale Caves

<https://clarecastleballiea.clareheritage.org/topics/our-irish-natural-history/brown-bear-patella-discovery-in-the-edenvale-caves/>

58. Castlepook Cave, Cork: County Geological Site Report

https://gsi.geodata.gov.ie/downloads/Geoheritage/Reports/CK032_Cork_CGS_Castlepook_Cave.pdf

59. Castlepook Caves

https://www.npws.ie/sites/default/files/publications/pdf/Goodwillie_1986_ASI_Cork.pdf

60. Cenozoic: Tertiary and Quaternary (Until 11,700 Years Ago)

<https://files.core.ac.uk/download/pdf/297011667.pdf>

61. 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>

62. 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>

63. 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.2022.107345>

64. Composition and Consequences of the IntCal20 Radiocarbon Calibration Curve

<https://pure.qub.ac.uk/en/publications/composition-and-consequences-of-the-intcal20-radiocarbon-calibrat/>

65. Conserving Quaternary Geoheritage in Northern Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0016787822000670>

66. Consistently Dated Atlantic Sediment Cores Over the Last 40 Thousand Years

<https://pmc.ncbi.nlm.nih.gov/articles/PMC6718518>

67. **Could Brown Bears (*Ursus arctos*) Have Survived in Ireland During the Last Glacial Maximum?**
<https://pmc.ncbi.nlm.nih.gov/articles/PMC3730640/>
68. **Could Brown Bears (*Ursus arctos*) Have Survived in Ireland During the Last Glacial Maximum?**
<https://doi.org/10.1098/rsbl.2013.0281>
69. **Dansgaard–Oeschger Events in Climate Models: Review and Baseline Marine Isotope Stage 3 Protocol**
<https://cp.copernicus.org/articles/19/915/2023/>
70. **Dating Constraints on the Last British-Irish Ice Sheet: a Map and Database**
<https://www.tandfonline.com/doi/pdf/10.4113/jom.2011.1145>
71. **Dating Constraints on the Last British-Irish Ice Sheet: A Map and Database**
<https://doi.org/10.4113/jom.2011.1145>
72. **Deglacial Rates and Controls for BIIS Western Margin**
<https://pure.uhi.ac.uk/files/15996924/jqs.3315.pdf>
73. **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/>
74. **Deglaciation, Earth Crustal Behaviour and Sea-Level Changes in the Determination of Insularity: A Perspective from Ireland**
<https://doi.org/10.1144/GSL.SP.1995.096.01.14>
75. **Deglaciation Chronology of the Donegal Ice Centre, North-West Ireland**
<https://onlinelibrary.wiley.com/doi/full/10.1002/jqs.3077>
76. **Deglaciation Chronology of the Donegal Ice Centre, North-West Ireland**
<https://doi.org/10.1002/jqs.3077>
77. **Deglaciation Chronology of the Donegal Ice Centre, North-West Ireland**
<https://eprints.gla.ac.uk/176550/>
78. **Dimensions and Chronology of the Last Ice Sheet in Western Ireland**
<https://www.sciencedirect.com/science/article/abs/pii/S0277379107003022>
79. **Dimensions and Chronology of the Last Ice Sheet in Western Ireland**
<https://doi.org/10.1016/j.quascirev.2007.10.019>
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-irelan/>
81. **Dimensions and chronology of the last ice sheet in Western Ireland**
<https://doi.org/10.1016/j.quascirev.2007.11.013>
82. **Dimensions and Chronology of the Last Ice Sheet in Western Ireland**
<https://doi.org/10.1016/j.quascirev.2007.06.023>
83. **Dimensions and Chronology of the Last Ice Sheet in Western Ireland**
<https://doi.org/10.1016/j.quascirev.2007.12.023>
84. **Dryas octopetala**
<https://fermanagh.bsbi.org/dryas-octopetala-l>
85. **Dynamic Cycles, Ice Streams and Their Impact on the Extent, Chronology and Deglaciation of the British-Irish Ice Sheet**
<https://nora.nerc.ac.uk/id/eprint/7166/>
86. **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
87. **Dynamic Cycles, Ice Streams and Their Impact on the Extent, Chronology and Deglaciation of the British–Irish Ice Sheet**
<https://doi.org/10.1016/j.quascirev.2008.12.026>
88. **Early Deglaciation of the British-Irish Ice Sheet on the Atlantic Margin**
<https://eprints.whiterose.ac.uk/140069/8/1-s2.0-S0277379117306157-main.pdf>

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://doi.org/10.1016/j.quascirev.2018.12.022>
90. **Early Deglaciation of the British-Irish Ice Sheet on the Atlantic Shelf Northwest of Ireland Driven by Glacioisostatic Depression and High Relative Sea Level**
<https://www.sciencedirect.com/science/article/pii/S0277379117306157>
91. **Early Deglaciation of Western Ireland and Implications for the Timing of Late Pleistocene Climate Change**
<https://livrepository.liverpool.ac.uk/3033771/1/OCofaighetal2019Early%20deglaciation%20of%20western%20Ireland.pdf>
92. **Early Midlandian–Middle Midlandian, Pleistocene, Northern Ireland**
https://earthwise.bgs.ac.uk/index.php/Early_Midlandian%E2%80%93Middle_Midlandian,_Pleistocene,_Northern_Ireland
93. **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
94. **Episodic Speleothem Deposition Tracks the Terrestrial Impact of Millennial-Scale Climate Variability during Marine Isotope Stage 3**
<https://files01.core.ac.uk/download/pdf/74206935.pdf>
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.2016.09.019>
96. **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>
97. **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>
98. **Episodic Speleothem Deposition Tracks the Terrestrial Impact of Millennial-Scale Last Glacial Climate Variability in SW Ireland**
<https://doi.org/10.1016/j.quascirev.2016.06.012>
99. **ESCR Site Summary: The Quaternary of Northern Ireland**
<https://www2.habitas.org.uk/escr/summary.php?item=101>
100. **European Middle and Upper Palaeolithic radiocarbon dates are often older than they look: problems with previous dates and some remedies**
<https://doi.org/10.1017/S0003598X00067570>
101. **European Phylogeography of the Common Frog (*Rana temporaria*): Routes of Postglacial Colonization into the British Isles, and Evidence for an Irish Glacial Refugium**
<https://www.nature.com/articles/hdy2008133>
102. **European Vegetation During Marine Oxygen Isotope Stage 3**
<https://www.cambridge.org/core/journals/quaternary-research/article/abs/european-vegetation-during-marine-oxygen-isotope-stage3/76FE9ACB0B9E623A4B57164188487A4B>
103. **Explore: The Wonder Cabinet**
<https://cms.museum.ie/en-IE/Museums/Natural-History/Engage-And-Learn/Museum-at-Home/The-Wonder-Cabinet>
104. **Exploring Controls of the Early and Stepped Deglaciation on the Western Margin of the British-Irish Ice Sheet**
<https://research.bangor.ac.uk/portal/files/38946826/jqs.3315.pdf>
105. **Exploring Controls of the Early and Stepped Deglaciation on the Western Margin of the British-Irish Ice Sheet**
https://pure.bangor.ac.uk/ws/portalfiles/portal/37340552/JQS_20_0108.R1_Accepted.pdf
106. **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>
107. **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>
108. **Exploring Controls of the Early and Stepped Deglaciation on the Western Margin of the British Irish Ice Sheet**
<https://livrepository.liverpool.ac.uk/3124996/1/jqs.3315.pdf>

109. Exploring controls of the early and stepped deglaciation on the western margin of the British Irish Ice Sheet

https://researchportal.plymouth.ac.uk/files/39237921/JQS-20-0108.R1_Benetti_Mar21.pdf

110. 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>

111. Exploring the Glacial History of the North-Western Sector of the Last British–Irish Ice Sheet

https://research-repository.st-andrews.ac.uk/bitstream/10023/23305/1/Benetti_2021_JQS_Exploring_CC.pdf

112. Exposure-Age Constraints on the Extent, Timing and Rate of Retreat of the Last Irish Sea Ice Stream

<https://doi.org/10.1016/j.quascirev.2010.04.002>

113. 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>

114. 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>

115. Extent and Retreat History of the Barra Fan Ice Stream Offshore Western Scotland and Northern Ireland During the Last Glaciation

<https://livrepository.liverpool.ac.uk/3028633/>

116. Extent and Timing of the Last Glacial Maximum (LGM) in Britain and Ireland: A Review

<https://onlinelibrary.wiley.com/doi/abs/10.1002/jqs.1404>

117. Extent and Timing of the Last Glacial Maximum (LGM) in Britain and Ireland: a Review

<https://doi.org/10.1002/jqs.1404>

118. Extent and Timing of the Last Glacial Maximum in Britain and Ireland: A Review

<https://onlinelibrary.wiley.com/doi/10.1002/jqs.1404>

119. Fast and Slow Components of Interstadial Warming in the North Atlantic During the Last Glacial

<https://www.nature.com/articles/s43247-020-0006-x>

120. Field Guides

<https://iqua.ie/publications/field-guides/>

121. 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/>

122. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

<https://mariondowd.com/wp-content/uploads/2025/04/2016-qsr-palaeolithic-ireland.pdf>

123. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

<https://doi.org/10.1016/j.quascirev.2016.02.029>

124. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

https://clarecastleballiea.clareheritage.org/wp-content/uploads/sites/5/2025/03/First_evidence_of_a_Late_Upper_Palaeolit.pdf

125. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

<https://www.sciencedirect.com/science/article/pii/S0277379116300610>

126. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

<https://doi.org/10.1016/j.quascirev.2016.07.010>

127. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

<https://doi.org/10.1016/j.quascirev.2016.07.011>

128. Freshwater Organic Deposits and Stratified Sediments Between Early and Late Midlandian (Devensian) Till Sheets, at Aghnadarragh, County Antrim, Northern Ireland

<https://doi.org/10.1002/jqs.3390020104>

129. Freshwater Organic Deposits and Stratified Sediments Between Early and Late Midlandian (Devensian) Till Sheets at Aghnadarragh, County Antrim, Northern Ireland

<https://doi.org/10.1002/jqs.3390020103>

130. Geology of Ireland

<https://gsi.ie/geoscience-topics/geology/geology-of-ireland/>

131. Glacial Geomorphology in the Wicklow Mountains, Ireland

<https://doi.org/10.1080/17445647.2022.2132885>

132. Glacial geomorphology in the Wicklow Mountains, Ireland

<https://www.tandfonline.com/doi/full/10.1080/17445647.2022.2132885>

133. Glacio-Geological Databases: Quaternary

<https://gsi.geodata.gov.ie/server/rest/services/Quaternary>

134. Growth, Dynamics and Deglaciation of the Last British-Irish Ice Sheet: the Deep-Sea Ice-Rafted Detritus Record

<https://nora.nerc.ac.uk/id/eprint/11204/>

135. Growth and retreat of the last British–Irish ice sheet, 31 000 to 15 000 years ago: the BRITICE-CHRONO reconstruction

<https://research-repository.st-andrews.ac.uk/handle/10023/26038>

136. 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>

137. 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%90chronos-reconstruction/>

138. 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>

139. Growth and Retreat of the Last British–Irish Ice Sheet, 31,000 to 15,000 Years Ago: The BRITICE-CHRONO Reconstruction

<https://pure.ulster.ac.uk/ws/portalfiles/portal/104683424/bor.12594.pdf>

140. 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/>

141. 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>

142. Growth and Retreat of the Last British–Irish Ice Sheet, 31,000 to 15,000 Years Ago: The BRITICE-CHRONO Reconstruction

<https://pure.ulster.ac.uk/files/104683424/bor.12594.pdf>

143. 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>

144. 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/533160/1/Boreas%20-%202022%20-%20Clark%20-%20Growth%20and%20retreat%20of%20the%20last%20British%20Irish%20Ice%20Sheet%2031%20000%20to%2015%20000%20years%20ago%20the.pdf>

145. 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>

146. 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-briticechronos-reconstruction>

147. 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/>

148. Guide to the National Museum of Ireland

https://www.museum.ie/getmedia/e46732aa-23b9-459c-9522-0a8604f4df98/nhm_guide_web_en_1.pdf

149. Guide to the National Museum of Ireland: Archaeology

https://www.museum.ie/getmedia/a3ebbb22-2057-4200-aae8-cd958854d89f/ks_guide_web_en-%281%29.pdf

150. Heritage Artefacts of County Cork

<https://www.corkcoco.ie/sites/default/files/2023-06/heritage-artefacts-of-county-cork-2021.pdf>

151. High-Resolution Record of Northern Hemisphere Climate Extending into the Last Interglacial Period

<https://doi.org/10.1038/nature02805>

152. Historic Environment Viewer for Archaeological and Architectural Heritage

<https://www.gov.ie/en/department-of-culture-communications-and-sport/services/historic-environment-viewer-for-archaeological-and-architectural-heritage/>

153. Ice Age Ireland

https://www.museum.ie/getmedia/acab45bf-2252-4f25-9cf0-c0268f0c7f0d/Ice_Age_Activity_Overview.pdf

154. Ice Age Ireland: Cool Fossils!

https://www.museum.ie/getmedia/48b32fce-19cc-4d70-8e6f-2cf2d7aff73f/Ice_Age_Activity_Mammoth.pdf

155. IntCal - History

<https://intcal.org/history.html>

156. IntCal: International Radiocarbon Calibration

<https://intcal.org/index.html>

157. IntCal: International Radiocarbon Calibration

<https://www.intcal.org/>

158. IntCal: Radiocarbon Dating Research

<https://14chrono.org/research/intcal/>

159. IntCal History

<https://www.intcal.org/history.html>

160. IntCal Publications

<https://intcal.org/publications.html>

161. Introduction to the Glacial Sand and Gravel Landscapes of Northern Ireland

<https://www.habitas.org.uk/escr/site.asp?Item=439>

162. Introduction to the Late Quaternary and Holocene of Northern Ireland

<https://www.habitas.org.uk/escr/site.asp?Item=101>

163. Investigating seasonal mobility in Irish giant deer *Megaloceros giganteus* (Blumenbach, 1799) through strontium isotope ($^{87}\text{Sr}/^{86}\text{Sr}$) analysis

<https://doi.org/10.1002/jqs.3464>

164. Investigating seasonal mobility in Irish giant deer *Megaloceros giganteus* through strontium isotope analysis

https://research-portal.uu.nl/files/139756950/J_Quaternary_Science_2022_Douw_Investigating_seasonal_mobility_in_Irish_giant_deer_Megaloceros_giganteus_Blumenbach_.pdf

165. IQUA Newsletter 64

<https://iqua.ie/wp-content/uploads/2020/08/IQUA-Newsletter-64.pdf>

166. Ireland: Submerged Prehistoric Sites and Lands

<https://www.vliz.be/imisdocs/publications/343799.pdf>

167. Ireland: Submerged Prehistoric Sites and Landscapes

https://link.springer.com/chapter/10.1007/978-3-030-37367-2_11

168. Ireland: Submerged Prehistoric Sites and Landscapes

https://pure.ulster.ac.uk/ws/portalfiles/portal/78797612/IrelandSubmergedPrehistoricSit_chapter.pdf

169. Ireland: Submerged Prehistoric Sites and Landscapes

https://doi.org/10.1007/978-3-030-37367-2_11

170. Ireland Through Geological Time

<https://www.gsi.ie/education/the-geology-of-ireland/ireland-through-geological-time/>

171. Ireland's Earliest Settlers: Evidence for an Irish Palaeolithic

https://pure.qub.ac.uk/files/373000291/JSmall_thesis_final_2.pdf

172. Ireland's Fallow Deer: Their Historical, Archaeological and Biomolecular Records

<https://researchrepository.ucd.ie/entities/publication/b73ac3be-b75c-4c5e-a11d-4b488e173e27>

173. 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/>

174. Irish Cave Exploration

<https://www.nature.com/articles/012212b0>

175. Irish Fauna: Ground Floor

https://www.museum.ie/getmedia/cd11862c-a1a7-4691-a39f-d8f77f2268ea/nhm_guide_web_en.pdf

176. Irish Pleistocene Biostratigraphy

<https://doi.org/10.3318/irisjeartscie.2019.02>

177. Irish Pleistocene Biostratigraphy

https://www.researchgate.net/publication/290822499_Irish_Pleistocene_biostratigraphy

178. Irish Pleistocene Biostratigraphy

<https://www.jstor.org/stable/30002348>

179. Irish Quaternary Association

<https://iqua.ie/>

180. Irish Quaternary Vertebrates

https://doi.org/10.2991/978-94-6239-219-9_9

181. Irish Quaternary Vertebrates

https://www.researchgate.net/publication/309313860_Irish_Quaternary_Vertebrates

182. Karst of Ireland

https://gsi.geodata.gov.ie/downloads/Groundwater/Other/GSI_Karst_of_Ireland_David_Drew_2018.pdf

183. 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

184. Last Glacial Maximum Cirque Glaciation in Ireland and Implications for Reconstructions of the Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2016.06.027>

185. 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>

186. 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/>

187. Last Glacial Maximum Cirque Glaciation in Ireland and Implications for Reconstructions of the Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2016.05.020>

188. 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>

189. Last Glacial Maximum Cirque Glaciation in Ireland and Implications for the Extent of the British-Irish Ice Sheet

https://aaronmbarth.weebly.com/uploads/3/7/9/8/37989143/barth_et_al__2016__qsr.pdf

190. Lateglacial Vegetation and Environment in Ireland: First Results from Four Western Sites

<https://www.sciencedirect.com/science/article/pii/S0277379193900079>

191. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0277379110000132>

192. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland

<https://doi.org/10.1016/j.quascirev.2010.01.011>

193. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland

<https://doi.org/10.1016/j.quascirev.2010.02.008>

194. Late Pleistocene chronostratigraphy and ice sheet limits, southern Ireland

<https://doi.org/10.1016/j.quascirev.2009.12.010>

195. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland

<https://doi.org/10.1016/j.quascirev.2010.02.010>

196. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland

<https://durham-repository.worktribe.com/output/1486214>

197. Late Quaternary Stratigraphy and Glacial History of Southern Ireland - INQUA Field Guide

<https://durham-repository.worktribe.com/output/1120995/late-quaternary-stratigraphy-and-glacial-history-of-southern-ireland-inqua-field-guide>

198. 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>

199. Mammals

<https://cms.museum.ie/en-IE/Collections-Research/Natural-History-Collections/Collections-List/Mammals>

200. 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>

201. 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.2769>

202. 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.2639>

203. Mammoth Cave

<https://irishcaves.ubss.org.uk/gazetteer/cork/mammoth-cave/>

204. Marine20—The Marine Radiocarbon Age Calibration Curve (0–55,000 cal BP)

<https://doi.org/10.1017/RDC.2020.68>

205. Marine Geophysical Evidence for Late Pleistocene Ice Sheet Extent and Recession off Northwest Ireland

<https://pure.ulster.ac.uk/en/publications/marine-geophysical-evidence-for-late-pleistocene-ice-sheet-extent-3/>

206. Marine Isotope Stage 3 Sea Level Fluctuations: Data Synthesis and New Outlook

<https://doi.org/10.1029/2007RG000226>

207. 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>

208. Maximum Extent and Dynamic Behaviour of the Last British–Irish Ice Sheet West of Ireland

<https://www.sciencedirect.com/science/article/pii/S027737911530113X>

209. Maximum Extent and Dynamic Behaviour of the Last British–Irish Ice Sheet West of Ireland

<https://doi.org/10.1016/j.quascirev.2015.12.012>

210. 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>

211. 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>

212. 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>

213. *Menyanthes trifoliata*

<https://fermanagh.bsbi.org/menyanthes-trifoliata-l>

214. Mesolithic – Iron Age

<https://heritageireland.ie/articles/mesolithic-iron-age-8000bc-400ad/>

215. Middle Midlandian Interstadial Deposits at Greenagho, Near Belcoo, County Fermanagh, Northern Ireland

<https://www.jstor.org/stable/30002377>

216. Middle Midlandian Interstadial Deposits at Greenagho, Near Belcoo, County Fermanagh, Northern Ireland

<https://eurekamag.com/research/018/968/018968909.php>

217. *Myriophyllum alterniflorum* (Alternate Water-milfoil)

<https://fermanagh.bsbi.org/myriophyllum-alterniflorum-dc>

218. New Age Constraints for the Maximum Extent of the Last British-Irish Ice Sheet (NW Sector)

<https://nora.nerc.ac.uk/id/eprint/21216/>

219. New Data for the Last Glacial Maximum in Great Britain and Ireland

<https://www.sciencedirect.com/science/article/pii/S0277379101001020>

220. 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/>

221. New Data for the Last Glacial Maximum in Great Britain and Ireland

[https://doi.org/10.1016/S0277-3791\(01\)00102-0](https://doi.org/10.1016/S0277-3791(01)00102-0)

222. New Data for the Last Glacial Maximum in Great Britain and Ireland

<https://pub.geus.dk/en/publications/new-data-for-the-last-glacial-maximum-in-great-britain-and-irelan/>

223. New data for the Last Glacial Maximum in Great Britain and Ireland

[https://doi.org/10.1016/S0277-3791\(00\)00140-2](https://doi.org/10.1016/S0277-3791(00)00140-2)

224. New data for the Last Glacial Maximum in Great Britain and Ireland

[https://doi.org/10.1016/S0277-3791\(00\)00140-3](https://doi.org/10.1016/S0277-3791(00)00140-3)

225. New Data for the Last Glacial Maximum in Great Britain and Ireland

[https://doi.org/10.1016/S0277-3791\(01\)00109-4](https://doi.org/10.1016/S0277-3791(01)00109-4)

226. New Data for the Last Glacial Maximum in Great Britain and Ireland

[https://doi.org/10.1016/S0277-3791\(01\)00102-3](https://doi.org/10.1016/S0277-3791(01)00102-3)

227. New data for the Last Glacial Maximum in Great Britain and Ireland

[https://doi.org/10.1016/S0277-3791\(01\)00102-6](https://doi.org/10.1016/S0277-3791(01)00102-6)

228. 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>

229. 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

230. New Insights on the Fauna of Ireland's Younger Dryas and Early Holocene from Alice & Gwendoline Cave

<https://mariondowd.com/wp-content/uploads/2025/04/2024-qsr-ag.pdf>

231. 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>

232. NGRIP ice-core data and the GICC05modelext timescale

<https://nbi.ku.dk/english/research/pice/centre-for-ice-and-climate/data/>

233. North GRIP – Greenland Ice Core Chronology 2005, 60,000 Year, 20 Year Resolution

<https://www.ncei.noaa.gov/access/paleo-search/study/6086>

234. North of Ireland: Field Guide

<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-13-unlocked.pdf>

235. Occurrence of Mammalia Relicts at Site Castlepook Cave

<https://doi.pangaea.de/10.1594/PANGAEA.63585>

236. On the Cave of Castlepook, Near Doneraile, Co. Cork

<https://doi.org/10.1017/S0016756800122435>

237. On the discovery of hyaena, mammoth and other extinct mammals in a carboniferous cavern in County Cork

https://sources.nli.ie/Record/PS_UR_095315

238. Origin of British and Irish Mammals: Disparate Post-Glacial Colonisation and Species Introductions

<https://www.sciencedirect.com/science/article/pii/S0277379114002078>

239. 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>

240. 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>

241. Oscillating Retreat of the Last British-Irish Ice Sheet on the Continental Shelf Offshore Galway Bay, Western Ireland

<https://eprints.gla.ac.uk/206157/>

242. Our Ancient Landscapes: Hunter-Gatherers in Ireland

<https://www.heritagecouncil.ie/content/files/Our-Ancient-Landscapes-Hunter-Gatherers-in-Ireland.pdf>

243. Outreach and Education Resources

<https://iqua.ie/outreach-and-education-resources/>

244. OxCal: Online Radiocarbon Calibration

<https://c14.arch.ox.ac.uk/oxcal.html>

245. Palaeoecology: Irish Quaternary Association Field Guide

<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-16-600dpi.pdf>

246. 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>

247. Pattern, Style and Timing of British–Irish Ice Sheet Advance and Retreat Over the Last 45,000 Years

<https://onlinelibrary.wiley.com/doi/10.1002/jqs.3296>

248. Pattern, Style and Timing of British–Irish Ice Sheet Advance and Retreat over the Last 45,000 Years: Evidence from NW Scotland and the Adjacent Continental Shelf

<https://doi.org/10.1002/jqs.3296>

249. Pattern, style and timing of British–Irish Ice Sheet advance and retreat over the last 45,000 years: evidence from NW Scotland and the adjacent continental shelf

<https://eprints.gla.ac.uk/234472/1/234472.pdf>

250. Pattern, Style and Timing of British–Irish Ice Sheet Advance and Retreat Over the Last 45,000 Years: Evidence from NW Scotland and the Adjacent Continental Shelf

<https://nora.nerc.ac.uk/id/eprint/530254/>

251. Pattern and Timing of Retreat of the Last British-Irish Ice Sheet

<https://nora.nerc.ac.uk/id/eprint/507486/>

252. Pattern and Timing of Retreat of the Last British-Irish Ice Sheet

<https://research.manchester.ac.uk/en/publications/pattern-and-timing-of-retreat-of-the-last-british-irish-ice-sheet/>

253. Pattern and Timing of Retreat of the Last British-Irish Ice Sheet

<https://www.sciencedirect.com/science/article/pii/S0277379110002817>

254. Pattern and Timing of Retreat of the Last British-Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2010.07.019>

255. Pattern and Timing of Retreat of the Last British–Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2011.09.016>

256. Phylogeographic, Ancient DNA, Fossil and Morphometric Analyses Reveal Ancient and Modern Introductions of a Large Mammal: the Complex Case of Red Deer (*Cervus elaphus*) in Ireland

<https://www.npws.ie/sites/default/files/general/Quaternary%20Science%20Reviews%2042%20%282012%29%2074-84%20Carden%20et%20al.pdf>

257. Phylogeographic, Ancient DNA, Fossil and Morphometric Analyses Reveal Ancient and Modern Introductions of a Large Mammal: the Complex Case of Red Deer (*Cervus elaphus*) in Ireland

[https://www.npws.ie/sites/default/files/general/Quaternary%20Science%20Reviews%2042%20\(2012\)%2074-84%20Carden%20et%20al.pdf](https://www.npws.ie/sites/default/files/general/Quaternary%20Science%20Reviews%2042%20(2012)%2074-84%20Carden%20et%20al.pdf)

258. 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.2012.06.005>

259. 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>

260. Pleistocene History of *Betula* with Special Reference to the British Isles

<https://www.cambridge.org/core/journals/proceedings-of-the-royal-society-of-edinburgh-section-b-biological-sciences/article/abs/pleistocene-history-of-betula-with-special-reference-to-the-british-isles/0ECB8E868EC13DDE9FA5BBC7A790F4A9>

261. Pleistocene Mammals in Ireland (pre-10,000 Years B.P.)

<https://www.irishbiogeographicalsociety.com/pdf/OccPub1PostglacialConfIBS.pdf>

262. Pleistocene Vertebrates in the British Isles

https://www.rhinosourcecenter.com/pdf_files/133/1336577813.pdf

263. Prehistoric Details

<https://source.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-%281%29/Stone-Age/Prehistoric-Details>

264. 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)

265. 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>

266. Prehistoric Details: Stone Age

[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)

267. Preliminary Assessment of the Archive of Faunal Remains from Excavated Irish Cave Sites

https://www.researchgate.net/publication/256886486_Preliminary_assessment_of_the_archive_of_faunal_remains_from_excavated_Irish_cave_sites

268. Proceedings of the Royal Irish Academy: Castlepook Cave Exploration

https://upload.wikimedia.org/wikipedia/commons/d/da/Proceedings_of_the_Royal_Irish_Academy_%281A_proceedings%29ofro34roya%29.pdf

269. Publications

<https://iqua.ie/publications/>

270. Quaternary

<https://www.gsi.ie/data-and-maps/quaternary/>

271. Quaternary

<https://www.gsi.ie/ga-ie/data-and-maps/Pages/Quaternary.aspx>

272. Quaternary Deposits and Glacial Stratigraphy in Ireland

[https://doi.org/10.1016/0277-3791\(87\)90008-4](https://doi.org/10.1016/0277-3791(87)90008-4)

273. Quaternary deposits and glacial stratigraphy in Ireland

<https://www.sciencedirect.com/science/article/abs/pii/0277379187900084>

274. Quaternary Geological Map of Ireland

https://inchheritage.org/dist/resources/Quaternary_500k_All_Ireland_Map.pdf

275. Quaternary Geological Map of Ireland 1:500,000 Scale

<https://www.gsi.ie/en-ie/publications/Pages/Quaternary-Geological-Map-of-Ireland-1500%2C000.aspx>

276. Quaternary Geology

<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-28-Corrected-after-print-version.pdf>

277. Quaternary Geology of Ireland

<https://gsi.ie/en-ie/data-and-maps/Pages/Quaternary.aspx>

278. Quaternary Site Descriptions

<https://iqua.ie/wp-content/uploads/2020/10/Quaternary-sites-of-Ireland-map-INQUA-2019.pdf>

279. Radiocarbon Constraints on Readvances of the British–Irish Ice Sheet in the Northern Irish Sea Basin During the Last Deglaciation

<https://www.sciencedirect.com/science/article/abs/pii/S0277379107000431>

280. 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>

281. 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>

282. 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>

283. 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/>

284. Radiocarbon Constraints on the History of the Western Irish Ice Sheet Prior to the Last Glacial Maximum

<https://doi.org/10.1130/G23167A.1>

285. Radiocarbon Dates from the Oxford AMS System: Archaeometry Datelist 31

<https://onlinelibrary.wiley.com/doi/10.1111/j.1475-4754.2002.tb01101.x>

286. Radiocarbon Dates from the Oxford AMS System: Archaeometry Datelist 31

<https://doi.org/10.1111/j.1475-4754.2002.tb01101.x>

287. Radiocarbon Dating, Vol. 16, No. 1

<https://journals.uair.arizona.edu/index.php/radiocarbon/article/viewFile/381/386>

288. Recent Developments in Calibration for Archaeological and Environmental Samples

<https://eprints.gla.ac.uk/210774/>

289. Recent Progress on Combining Geomorphological and Geochronological Data with Ice Sheet Modelling, Demonstrated Using the Last British–Irish Ice Sheet

<https://nora.nerc.ac.uk/id/eprint/530567/>

290. 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>

291. 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>

292. Reconstruction and ³⁶Cl based geochronology of the deglaciation of central Ireland

<https://doi.org/10.1016/j.quascirev.2026.109846>

293. 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/>

294. Response of the Irish ice sheet to abrupt climate change during the last deglaciation

<https://doi.org/10.1016/j.quascirev.2012.01.001>

295. 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>

296. 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

297. 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/>

298. Revisiting Alice and Gwendoline Cave, Co. Clare: New Light on the 1902 Excavations

https://clarecastleball.ie/clareheritage.org/wp-content/uploads/sites/5/2025/03/Revisiting_Alice_and_Gwendoline_Cave_Co_compressed.pdf

299. *Salix herbacea* L. — BSBI Vice-county 8: Fermanagh

<https://fermanagh.bsbi.org/salix-herbacea-l>

300. Scientific Dating of Pleistocene Sites: Scientific Dating Methods

<https://historicengland.org.uk/images-books/publications/scientific-dating-pleistocene-sites/scientific-dating-methods/>

301. Sedimentary Ancient DNA Reveals Late Pleistocene Faunal Connectivity Between Ireland and Eurasia

<https://www.biorxiv.org/content/10.64898/2026.07.10.737191v1>

302. Sedimentary Ancient DNA Reveals Late Pleistocene Faunal Connectivity Between Ireland and Eurasia

<https://doi.org/10.64898/2026.07.10.737191>

303. 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>

304. 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/>

305. Sedimentology and Chronology of the Advance and Retreat of the Last British-Irish Ice Sheet on the Continental Shelf West of Ireland

<https://doi.org/10.1016/j.quascirev.2016.03.012>

306. *Selaginella selaginoides* (L.) P. Beauv. ex Schrank & Mart. — BSBI Vice-county 8: Fermanagh

<https://fermanagh.bsbi.org/selaginella-selaginoides-p-beauv>

307. Soils of County Waterford

<https://teagasc.ie/wp-content/uploads/2025/05/Waterford.pdf>

308. Soils of County Waterford

<https://www.teagasc.ie/media/website/publications/2011/Soils-of-Co-Waterford-WEB.pdf>

309. Spatio-Temporal Dynamics of Speleothem Growth and Glaciation in the British Isles

<https://cp.copernicus.org/articles/21/261/2025/>

310. Spatio-Temporal Dynamics of Speleothem Growth and Glaciation in the British Isles

<https://doi.org/10.5194/cp-21-261-2025>

311. Spotted Hyena Skull

<https://cms.museum.ie/ga-IE/Collections-Research/Collection/Documentation-Discoveries/Artefact/Spotted-Hyena-Skull/a8990d9b-84a9-4107-99b7-f3a8cc17a7d4>

312. Spotted Hyena Skull

<https://cms.museum.ie/en-IE/Collections-Research/Collection/Documentation-Discoveries/Artefact/Spotted-Hyena-Skull/a8990d9b-84a9-4107-99b7-f3a8cc17a7d4>

313. Stoats (*Mustela erminea*) Provide Evidence of Natural Overland Colonization of Ireland

<https://pmc.ncbi.nlm.nih.gov/articles/PMC2176200/>

314. Stone Age

<https://source.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-%281%29/Stone-Age>

315. 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>

316. 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/>

317. 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.2014.01.007>

318. The Antiquity of Man in Ireland

<https://www.cambridge.org/core/books/abs/irish-stone-age/antiquity-of-man-in-ireland/E2F2C600F242ED3B71040EF9A7B3E38C>

319. The Archaeology of Caves in Ireland

<https://caves.org/journal-of-cave-and-karst-studies/jcks-articles/the-archaeology-of-caves-in-ireland-2/>

320. The Archaeology of Caves in Ireland

<https://mariondowd.com/wp-content/uploads/2025/04/2015-the-archaeology-of-caves-in-ireland.pdf>

321. The Atlantic Meridional Overturning Circulation and Abrupt Climate Change

<https://doi.org/10.1146/annurev-marine-010816-060415>

322. The BRITICE CHRONO project: A new chronology for the British–Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2022.107002>

323. The Brown Bear (*Ursus arctos* L.) in Ireland

https://www.researchgate.net/publication/379235493_The_Brown_Bear_Ursus_arctos_L_in_Ireland

324. The Castlepook Cave Project

<https://www.corkcoco.ie/sites/default/files/2023-05/county-cork-heritage-grant-scheme-2023-1.pdf>

325. The Colonization of Ireland: A Human Ecology Perspective

https://hungarcolab.weebly.com/uploads/1/3/0/2/130279092/tune_2020_-_colonization_of_ireland.pdf

326. The Colonization of Ireland: A Human Ecology Perspective

<https://www.sciencedirect.com/science/article/pii/S0277379120305941>

327. The Colonization of Ireland: A Human Ecology Perspective

<https://doi.org/10.1016/j.quascirev.2020.106632>

328. 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>

329. The Deglaciation of the Western Sector of the Irish Ice Sheet from the Inner Continental Shelf to its Terrestrial Margin

<https://onlinelibrary.wiley.com/doi/10.1111/bor.12448>

330. 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>

331. 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>

332. The deglaciation of the western sector of the Irish Ice Sheet from the inner continental shelf to its terrestrial margin

<https://durham-repository.worktribe.com/output/1265047/the-deglaciation-of-the-western-sector-of-the-irish-ice-sheet-from-the-inner-continental-shelf-to-its-terrestrial-margin>

333. The Donegal Ice Dome, Northwest Ireland: Dimensions and Chronology

<https://doi.org/10.1002/jqs.1116>

334. The Ecology, Subsistence and Diet of ~45,000-Year-Old Homo sapiens at Ilsehöhle in Ranis, Germany

<https://pmc.ncbi.nlm.nih.gov/articles/PMC10927544/>

335. The Evolution of the Terrestrial-Terminating Irish Sea Glacier During the Last Glaciation

<https://doi.org/10.1002/jqs.3229>

336. The Evolution of the Terrestrial-Terminating Irish Sea Glacier During the Last Glaciation

<https://eprints.whiterose.ac.uk/id/eprint/163650/>

337. The Exploration of Castlepook Cave, Co. Cork

https://sources.nli.ie/Record/PS_UR_073459

338. The Exploration of Castlepook Cave, Co. Cork

https://sources.nli.ie/Record/PS_UR_073459/Details?lng=en&print=1&sid=111354

339. The Exploration of Castlepook Cave, County Cork

https://upload.wikimedia.org/wikipedia/commons/a/a2/Geological_magazine_%28IA_geologicalmagazi651918wood%29.pdf

340. The Exploration of Castlepook Cave, County Cork

<https://www.jstor.org/stable/20521031>

341. The exploration of Castlepook Cave, County Cork

<https://archive.org/details/proceedingsofroy34roya>

342. The Exploration of Castlepook Cave, County Cork

<https://filedn.eu/l40P8k9DAsNmBi2WfVocwS0/Historical%20Newspapers%2C%20Books%20%26%20Journals/Decies/Decies%20LXII%20-%202006.pdf>

343. The Exploration of Castlepook Cave, County Cork, Being the Third Report from the Committee Appointed to Explore Irish Caves

<https://www.jstor.org/stable/i20490272>

344. The Exploration of the Caves of County Clare: Geology

https://sources.nli.ie/Record/PS_UR_021495

345. The Geological Collections

<https://cms.museum.ie/en-IE/Collections-Research/Natural-History-Collections/Collections-List/Geology>

346. The Geological Heritage of County Leitrim

https://gsi.geodata.gov.ie/downloads/Geoheritage/Reports/Leitrim_Audit.pdf

347. The Glacial Deposits of the Maguiresbridge Area, County Fermanagh

<https://doczz.net/doc/7343058/the-glacial-deposits-of-the-maguires--bridge-area>

348. The Greenland Ice Core Chronology 2005, 15–42 ka. Part 1: Constructing the Time Scale

<https://doi.org/10.1016/j.quascirev.2006.08.002>

349. The Ice Age in Ireland

<https://www.askaboutireland.ie/narrative-notes/the-ice-age-in-ireland/index.xml>

350. The IntCal20 Approach to Radiocarbon Calibration Curve Construction: A New Methodology Using Bayesian Splines and Errors-in-Variables

<https://eprints.gla.ac.uk/217180/>

351. The IntCal20 Approach to Radiocarbon Calibration Curve Construction: A New Methodology Using Bayesian Splines and Errors-in-Variables

<https://www.cambridge.org/core/journals/radiocarbon/article/intcal20-approach-to-radiocarbon-calibration-curve-construction-a-new-methodology-using-bayesian-splines-and-errorsinvariables/FF2C650D3A7BBA277E9C51380BEC4050>

352. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)

<https://doi.org/10.1017/RDC.2020.41>

353. 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>

354. The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0–55 cal kBP)

<https://www.intcal.org/publications.html>

355. 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>

356. 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>

357. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)

<https://eprints.gla.ac.uk/210753/>

358. 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>

359. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)

<https://eprints.whiterose.ac.uk/id/eprint/158625/>

360. 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>

361. 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>

362. 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)

363. The Irish Quaternary Fauna Project

https://www.researchgate.net/publication/223448450_The_Irish_Quaternary_Fauna_Project

364. The Irish Quaternary Fauna Project

<https://www.sciencedirect.com/science/article/pii/S0277379196000376>

365. The Irish Quaternary Fauna Project

<https://www.sciencedirect.com/science/article/abs/pii/S0277379196000376>

366. The Island of Ireland: Drowning the Myth of an Irish Land-Bridge?

<https://www.tara.tcd.ie/items/af898505-9836-458c-a5d6-78ce11d608ab>

367. 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>

368. The Last Eurasian Ice Sheets – a Chronological Database and Time-Slice Reconstruction, DATED-1

<https://doi.org/10.1016/j.quascirev.2015.10.035>

369. The Last Glacial Maximum

<https://doi.org/10.1126/science.1172873>

370. The Last Glacial Maximum

<https://pubs.usgs.gov/publication/70036965>

371. The Last Glacial Maximum British–Irish Ice Sheet: A Reconstruction Using Digital Terrain Mapping

<https://doi.org/10.1002/jqs.1143>

372. The Last Irish Ice Sheet: Extent and Chronology

https://doi.org/10.2991/978-94-6239-219-9_5

373. The Late Quaternary History of East-Central Ireland

<https://www.cambridge.org/core/journals/geological-magazine/article/abs/late-quaternary-history-of-eastcentral-ireland/0317E3C5FD4FBCDC0B2A8C2BB9EFD707>

374. The Maguiresbridge Freshwater Bed

<https://limerickarchives.com/2026/09/18/the-maguiresbridge-freshwater-bed/>

375. The Nature and Timing of MIS 3 Interstadials: New Constraints from U-Series Dated Speleothems from Crag Cave, S.W. Ireland

<https://doi.org/10.1016/j.quaint.2012.08.078>

376. The Palaeoglaciology of the Central Sector of the British and Irish Ice Sheet During the Last Glacial Maximum

<https://eprints.whiterose.ac.uk/83244/1/Evans%20et%20al.%20QSR%20revised%20text%20and%20figures.pdf>

377. The Problem of a Late Quaternary Landbridge Between Britain and Ireland

<https://www.sciencedirect.com/science/article/pii/S0277379185900289>

378. 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)

379. The Quaternary History of Ireland

<https://www.tara.tcd.ie/bitstreams/969fd7c8-36ef-4262-a961-336fe7285015/download>

380. The Quaternary of the Irish Midlands

<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-21-300dpi-OCR.pdf>

381. The Stratigraphic Position and Age of the Gortian

https://www.burrengeopark.ie/wp-content/uploads/2014/08/GSI-The_Stratigraphic_Position_and_Age_of_the_Gor.pdf

382. The Subdivision of the Quaternary Period in Ireland

<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-17-unlocked.pdf>

383. The Timing and Magnitude of the British–Irish Ice Sheet Between Marine Isotope Stages 5d and 2

<https://doi.org/10.1002/jqs.3611>

384. 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>

385. 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/>

386. 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>

387. 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>

388. 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>

389. Timing and Pace of Ice-Sheet Withdrawal Across the Marine–Terrestrial Transition West of Ireland During the Last Glaciation

<https://research-repository.st-andrews.ac.uk/handle/10023/22990>

390. 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>

391. Trimlines, Blockfields and the Vertical Extent of the Last Ice Sheet in Southern Ireland

<https://doi.org/10.1111/bor.12109>

392. Trimlines, Blockfields and the Vertical Extent of the Last Ice Sheet in Southern Ireland

<https://onlinelibrary.wiley.com/doi/10.1111/bor.12109>

393. 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

394. Trimlines, Blockfields and the Vertical Extent of the Last Ice Sheet in Southern Ireland

<https://research-repository.st-andrews.ac.uk/handle/10023/6021>

395. UCD School of Archaeology Research Day 2022

https://www.ucd.ie/archaeology/t4media/UCD_Archaeology_Research_Day_2022.pdf

396. Upper Palaeolithic

<https://mariondowd.com/upper-palaeolithic-younger-dryas/>

397. 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>

398. Vertical dimensions and age of the Wicklow Mountains ice dome, Eastern Ireland, and implications for the extent of the last Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2006.01.026>

399. Vertical dimensions and age of the Wicklow Mountains ice dome, Eastern Ireland, and implications for the extent of the last Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2006.07.012>

400. What Was on the Menu in Prehistoric Ireland?

<https://www.rte.ie/brainstorm/2025/0815/1475736-prehistoric-ireland-food-mesolithic-iron-age-bronze-age/>

401. 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

402. Woolly Mammoth and Its Environment in Northern Europe During the Last Glaciation

<https://doi.org/10.1016/j.quascirev.2010.10.004>

Index

Aghnadarragh, 3429–3430, 3471–3472, 3474, 3508, 3574, 3631, 3643, 3694, 3705

Agriculture, 3411, 3485, 3501, 3582, 3602, 3619, 3655, 3679, 3694, 3698, 3714, 3726, 3757, 3773

Antrim, 3429, 3472, 3609, 3631, 3643, 3705

Birm-166, 3401, 3409, 3413, 3434, 3444, 3449, 3453, 3459–3460, 3487, 3492, 3495, 3499, 3502, 3516, 3527, 3539, 3546, 3550, 3558, 3563, 3565, 3569, 3580, 3584, 3587–3588, 3613, 3627, 3629, 3638, 3651, 3662, 3666, 3677, 3685, 3693, 3697, 3699–3700, 3704, 3707–3708, 3712, 3716–3717, 3728, 3736, 3740, 3744, 3752, 3763, 3771, 3775, 3780

Bogbean, 3402, 3406, 3410, 3413–3414, 3422, 3434, 3453, 3456–3457, 3460, 3476, 3484, 3488, 3496, 3516, 3524, 3531, 3535, 3539, 3551, 3566, 3577, 3581, 3585, 3589, 3592–3593, 3597, 3601, 3617, 3643, 3647, 3649, 3654–3655, 3657, 3667, 3671, 3678, 3682, 3686, 3690, 3694, 3698, 3700–3701, 3705, 3709, 3713, 3715, 3720–3721, 3729, 3737, 3741, 3744, 3749, 3753, 3756, 3767–3768, 3770, 3776, 3780

British-Irish Ice Sheet, 3452, 3482, 3779–3780

Castlepook, 3402–3403, 3406–3408, 3410–3412, 3414–3416, 3418–3424, 3426–3427, 3429–3430, 3433–3435, 3438–3439, 3441–3443, 3445–3447, 3449–3451, 3453–3454, 3456–3457, 3460–3462, 3465, 3469–3470, 3473–3474, 3476–3478, 3480–3482, 3484–3485, 3489–3490, 3493–3497, 3501–3503, 3505, 3508–3510, 3512–3513, 3516–3518, 3520–3521, 3524–3525, 3528–3529, 3531–3536, 3538–3541, 3544–3545, 3547–3549, 3552, 3555–3557, 3560–3561, 3563–3567, 3570–3571, 3574–3578, 3581–3582, 3586–3587, 3589–3591, 3594, 3598–3599, 3601–3603, 3605–3607, 3609–3615, 3618–3619, 3621–3622, 3625–3626, 3628–3629, 3631–3642, 3644–3645, 3648–3649, 3651–3652, 3654–3661, 3663–3664, 3668, 3670–3672, 3674–3675, 3678–3680, 3682–3684, 3687, 3690–3691, 3694–3695, 3698–3699, 3701–3703, 3706, 3709–3711, 3713–3715, 3717–3718, 3721–3723, 3725–3730, 3732, 3734–3735, 3738–3739, 3741–3743, 3745–3751, 3753–3757, 3760–3762, 3764–3766, 3769, 3772–3774, 3776–3778, 3781–3782, 3784–3790

Cave Hyena, 3556, 3612, 3614

Christianity, 3485

Clare, 3411, 3433, 3461, 3465, 3469, 3517, 3521, 3532, 3536, 3540, 3552, 3555, 3560, 3590, 3602, 3614, 3645, 3660, 3672, 3679, 3704, 3761, 3765, 3769, 3785, 3790

Connacht, 3701, 3780

County Fermanagh, 3401, 3405, 3409, 3413, 3417, 3422, 3425, 3428, 3434, 3437, 3440, 3444, 3448, 3453, 3455, 3460, 3463, 3467–3468, 3471, 3475, 3479, 3483, 3487, 3491, 3495, 3499, 3503, 3507, 3511, 3515, 3523, 3527, 3530, 3535, 3538, 3542, 3546, 3550–3551, 3554, 3558, 3565, 3569, 3573, 3576, 3580, 3584, 3588, 3592, 3596, 3600, 3604, 3608, 3613, 3616, 3620, 3625, 3627, 3631, 3634, 3638, 3642, 3646, 3651, 3654, 3662, 3666, 3670, 3673, 3677, 3681, 3685, 3689–3690, 3693, 3697, 3700, 3704, 3708, 3712–3713, 3716, 3720, 3724, 3728, 3732–3733, 3736, 3740, 3744, 3746, 3749, 3752, 3755, 3759, 3763, 3767, 3771, 3775, 3779, 3784

Crag Cave, 3402, 3417–3418, 3420, 3430, 3472, 3476, 3478, 3504, 3524, 3531, 3533, 3549, 3551, 3559, 3566, 3570–3571, 3581, 3589, 3625, 3628, 3639, 3643, 3645, 3655, 3667, 3674, 3686, 3721, 3723, 3757, 3768

Derry, 3401–3411, 3413–3414, 3416–3418, 3420, 3422, 3424–3426, 3428–3430, 3434–3441, 3443–3446, 3448–3449, 3451, 3453–3457, 3460, 3462–3465, 3467–3468, 3470–3472, 3474–3476, 3478–3480, 3482–3492, 3494–3500, 3503–3504, 3507–3508, 3510–3513, 3515–3516, 3518, 3523–3524, 3526–3532, 3535, 3538–3539, 3541–3543, 3545–3547, 3549–3552, 3554–3555, 3557–3559, 3561, 3563–3566, 3569–3571, 3573–3574, 3576–3577, 3579–3582, 3584–3585, 3588–3589, 3591–3593, 3595–3601, 3603–3605, 3607–3609, 3611, 3613, 3615–3622, 3625–3629, 3631, 3633–3639, 3641–3643, 3645–3649, 3651, 3654–3656, 3662–3664, 3666–3667, 3669–3671, 3673–3678, 3680–3682, 3684–3686, 3688–3695, 3697–3701, 3703–3705, 3708–3713, 3715–3733, 3735–3745, 3747, 3749–3750, 3752–3757, 3759–3760, 3762–3768, 3770–3772, 3774–3780, 3782, 3784, 3786

Derryvree, 3401–3411, 3413–3414, 3416–3418, 3420, 3422, 3424–3426, 3428–3430, 3434–3441, 3443–3446, 3448–3449, 3451, 3453–3457, 3460, 3462–3465, 3467–3468, 3470–3472, 3474–3476, 3478–3480, 3482–3492, 3494–3500, 3503–3504, 3507–3508, 3510–3513, 3515–3516, 3518, 3523–3524, 3526–3532, 3535, 3538–3539, 3541–3543, 3545–3547, 3549–3552, 3554–3555, 3557–3559, 3561, 3563–3566, 3569–3571, 3573–3574, 3576–3577, 3579–3582, 3584–3585, 3588–3589, 3591–3593, 3595–3601, 3603–3605, 3607–3609, 3611, 3613, 3615–3622, 3625–3629, 3631, 3633–3639, 3641–3643, 3645–3649, 3651, 3654–3656, 3662–3664, 3666–3667, 3669–3671, 3673–3678, 3680–3682, 3684–3686, 3688–3695, 3697–3701, 3703–3705, 3708–3713, 3715–3733, 3735–3745, 3747, 3749, 3752–3757, 3759–3760, 3762–3768, 3770–3772, 3774–3780, 3782, 3784, 3786

Donegal, 3566, 3593, 3613, 3647, 3686, 3760

Doneraile, 3402, 3406–3407, 3410, 3414, 3418, 3422, 3425–3426, 3429, 3433, 3438, 3441, 3445, 3449–3450, 3453, 3456, 3465, 3469, 3473, 3476, 3480, 3484, 3489, 3493, 3495–3496, 3501, 3505, 3508, 3512, 3516, 3520, 3524, 3528, 3531, 3535, 3539, 3544, 3547, 3552, 3555, 3560, 3563, 3565, 3570, 3573–3574, 3577, 3581, 3586, 3589, 3594, 3598, 3601, 3604–3605, 3609, 3613, 3618, 3621, 3625, 3628, 3631, 3634–3635, 3638, 3644, 3648, 3651, 3654, 3659, 3663, 3668, 3671, 3674, 3677–3678, 3682, 3687, 3690, 3694, 3698, 3701, 3706, 3709, 3713, 3717, 3721, 3725, 3729, 3734, 3738, 3741, 3745, 3749, 3753, 3755, 3760, 3764, 3772, 3776, 3781, 3784, 3788

Down, 3437, 3444, 3453, 3475, 3499, 3504, 3507, 3516, 3527, 3573, 3576, 3584–3585, 3592, 3596, 3616, 3625, 3642–3643, 3667, 3673, 3677, 3681, 3689, 3724, 3728, 3759, 3775, 3779, 3784

Education, 3409, 3432, 3440, 3471, 3507, 3530, 3612, 3681

Flora, 3416, 3434, 3464, 3476, 3528, 3547, 3551, 3585, 3593, 3597, 3599, 3609, 3616, 3618, 3635, 3638, 3674, 3678, 3705, 3733, 3771

Galway, 3432, 3444, 3448, 3452, 3475, 3479, 3596, 3624, 3677, 3704, 3740, 3744, 3748, 3779, 3787

Greenagho, 3410, 3418, 3429–3430, 3437, 3441, 3468, 3472, 3484, 3500, 3508, 3524, 3528, 3551, 3555, 3574, 3577, 3643, 3663, 3667, 3674, 3682, 3690, 3694, 3732–3733, 3735, 3741, 3757, 3760, 3784

Human presence, 3411, 3415, 3447, 3454, 3461, 3485–3486, 3506, 3518, 3521, 3529, 3536, 3552, 3556, 3561, 3567, 3571, 3578, 3595, 3599, 3622, 3630, 3636, 3643, 3645, 3672, 3679, 3683, 3699, 3702, 3708, 3711, 3715, 3718, 3722, 3726, 3735, 3738–3739, 3746, 3749, 3765, 3769, 3777

Hyenahall, 3542, 3544, 3685, 3688

Irish language, 3519, 3757

Kerry, 3402, 3418, 3472, 3476, 3504, 3520, 3524, 3531, 3549, 3551, 3559, 3566–3567, 3570, 3581, 3625, 3628, 3639, 3643, 3655, 3674, 3686, 3721, 3757, 3768

Leinster, 3780

Leitrim, 3550

Limerick, 3670

Maguirebridge, 3463, 3475, 3562, 3588, 3620, 3662, 3724, 3755, 3759

Maguiresbridge, 3401, 3405, 3409, 3413, 3417, 3422, 3425, 3428, 3434, 3437, 3440, 3444, 3447–3448, 3453, 3455, 3460, 3463, 3467–3468, 3471, 3475, 3479, 3483, 3487, 3491, 3495, 3499, 3503, 3507, 3511, 3515, 3523, 3527–3528, 3530, 3535, 3538, 3542, 3546, 3550, 3554, 3558, 3563, 3565, 3569, 3572–3573, 3576, 3580–3581, 3584, 3588–3589, 3592, 3596, 3600, 3604, 3608, 3616, 3620, 3625, 3627, 3630–3631, 3634, 3638, 3642–3643, 3646, 3651, 3654, 3662, 3666, 3670, 3673–3674, 3677, 3681, 3685, 3689, 3693, 3697, 3700, 3704, 3708, 3712, 3716, 3720, 3724, 3728, 3733, 3736, 3740, 3744, 3749, 3752, 3755, 3759, 3763, 3767, 3771, 3775, 3779, 3784

Mammoth Cave, 3402, 3422, 3426, 3429, 3433, 3452–3453, 3469, 3484, 3493, 3496, 3501, 3505, 3544, 3563, 3565, 3570, 3577, 3581, 3589, 3613, 3625, 3628, 3635, 3639, 3644, 3651, 3655, 3659, 3663, 3687, 3690, 3698, 3717, 3725, 3729, 3734, 3738, 3740–3741, 3749, 3755, 3764, 3776, 3784

Mesolithic, 3411, 3477, 3481, 3497, 3513, 3529, 3548, 3575, 3582, 3595, 3598, 3640, 3699, 3702, 3750, 3773, 3785

Migration, 3454, 3464, 3473, 3489, 3493, 3497, 3523, 3529, 3544, 3552, 3560–3561, 3565, 3574, 3577–3578, 3594, 3598, 3602, 3605, 3614, 3616, 3626, 3636, 3640, 3642, 3656, 3664, 3679, 3685, 3693, 3702, 3753, 3769, 3773

Munster, 3574, 3617, 3688, 3780

Music, 3415, 3521, 3560, 3619, 3660, 3664, 3684, 3691, 3746, 3789

Muskeg, 3402, 3406, 3410, 3414, 3418, 3422, 3426, 3429, 3441, 3444, 3449, 3453, 3456, 3460, 3464, 3472, 3480, 3492, 3496, 3500, 3508, 3512, 3516, 3531, 3539, 3543, 3551, 3559, 3566, 3570, 3574, 3581, 3589, 3601, 3605, 3613, 3616–3617, 3619, 3621, 3625, 3628, 3634–3635, 3643, 3647, 3651, 3655, 3663, 3667, 3678, 3686, 3690, 3698, 3709, 3713, 3717, 3725, 3733, 3737, 3753, 3763–3764, 3768, 3772, 3776, 3780

Neolithic, 3699, 3726

Palaeoenvironment, 3569, 3650

Transport, 3403, 3407, 3411, 3419, 3423, 3429, 3461, 3464, 3473, 3477, 3480, 3510, 3535, 3543, 3566, 3586, 3598, 3624, 3626, 3630, 3644, 3656, 3671, 3687, 3690, 3714, 3730, 3741, 3745, 3773, 3777

Ulster, 3780

Wicklow, 3577, 3643, 3768