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ANTIQUITY

1

YEAR 11

TONI HURLEY | CHRISTINE MURRAY

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FOURTH EDITION

ANTIQUITY

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TONI HURLEY | CHRISTINE MURRAY | PHILIPPA MEDCALF | JAN ROLPH

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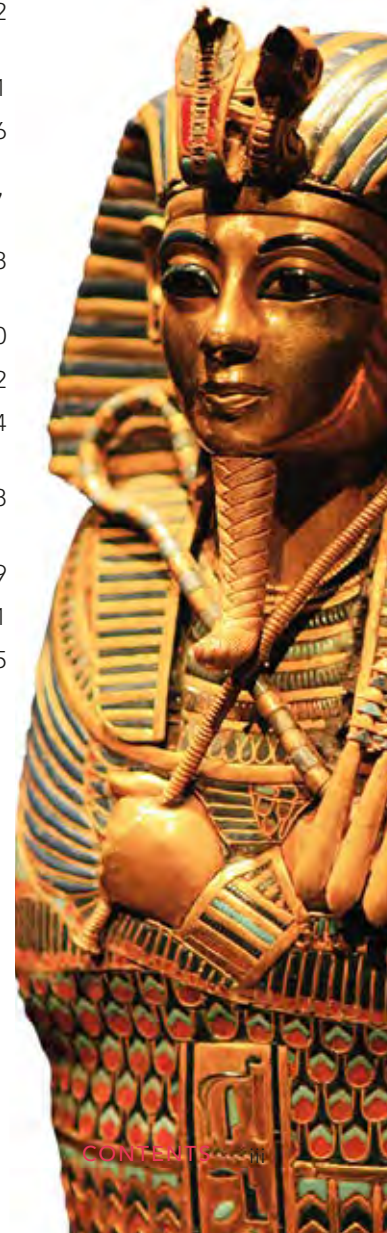
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New South Wales' most trusted Ancient History series has been updated for the new Ancient History Stage 6 syllabus. The first of a two-volume series, *Antiquity 1* offers complete support for Year 11 teachers and their students, providing unparalleled depth and coverage and a range of new chapter features that will give students of all abilities the best chance of achieving success in Ancient History.

Key enhancements:

- All content has been explicitly aligned to the new Ancient History Stage 6 syllabus (Year 11).
- Subject experts, Toni Hurley and Christine Murray, have developed comprehensive, engaging and appropriately levelled content.
- Unambiguous language is used throughout the book, with visuals on every spread to engage students and support learning.
- eBook assess provides comprehensive student and teacher digital support including answers to every question in the book, detailed teacher notes, support for assessment and exam preparation, videos and more.



'Focus questions', 'Focus concepts and skills' and 'Learning outcomes' are clearly stated at the beginning of each chapter to guide teachers and students through the content.

Content includes the latest scientific developments, up-to-date case studies, maps and rich visual and written source material.

FOCUS QUESTIONS

- 1 How have the human remains in this chapter been discovered, removed from where they were found, and preserved?
- 2 What scientific methods have been used to investigate and preserve the Tollund?
- 3 What is the significance of the human remains and associated objects for an understanding of the life and times in which these people lived?
- 4 What ethical issues are relevant to the treatment, display and ownership of the remains?

FOCUS CONCEPTS & SKILLS

Significance

We place particular importance on events, people and places of the past as reflected by the significance of the human remains studied as well as how the scientific aspects and preservation of those remains is conducted. Using this, judgments can be made about the relative importance of theories in history to reconstruct these people's lives and their context. It is important to consider the ethical issues relating to the treatment, preservation, analysis, significance and display of human remains.

LEARNING OUTCOMES

- Explain how the human remains in this chapter have been discovered, removed from where they were found, and preserved.
- Analyse what scientific and written evidence reveal about the lives and deaths of ancient people, their societies, health and environment.
- Discuss the ethical issues involved in the treatment, display and ownership of the remains.
- Assess the significance of the study of human remains for an understanding of the past.

Margin glossary definitions help students easily find the meaning of unfamiliar words and assist with their understanding.

6.1 Human remains from the past

Many discoveries of ancient human remains have been made over time. A quick survey of newspapers, archaeological magazines and television documentaries reveals exciting reports of 'bog bodies' in Ireland, 'ice maidens' in Siberia and Peru, the Iceman in the Austrian Orntal Alps, mummified Egyptian babies, ancient Chinese mummies of the Tianshan Basin and, of course, Egyptian mummies. These ancient human remains have survived for a variety of reasons and historians rely heavily on the work of scientists to unlock their secrets. This chapter focuses on the preservation, analysis, significance and display of human remains. It will investigate bog bodies, particularly Lindesay Man and the Iceman, Oetzi.

Bog bodies

From time to time, people have come across preserved bodies in the bogs of northern Europe. The state of preservation of many of these bodies is so good that the discoverers have naturally assumed that they were recent murder victims and the local police have been called to investigate. For example, in England in 1983 a man confused to the murder of his wife when the partial remains of a human skull were found in a peat excavation site at the rear of his house. It was only after scientific investigation was conducted to determine the age of the remains that it became clear that the owner of the skull had died almost 2000 years ago.

The first recorded discovery of a bog body was in the Netherlands in the late 18th century, but people had no doubt found bodies before this as they are peat from the bogs to use as fuel for their fires. Many were obtained in local contexts, as once one of the peat and without artificial preservation, these bodies would have decomposed quickly.

Bog bodies have been dated from the Stone Age to modern times, but the best preserved examples date from the Iron Age and Roman periods, when the dominant culture of these regions was Celtic (see Chapter 11 The Celts). The reasons why they came to be in the bogs are diverse: accidental death, burial, murder and ritual sacrifice have all been suggested.

Where are bog bodies found?

Bog bodies have been found and recorded in the United Kingdom, Ireland, the Netherlands, Denmark and Germany especially since the 1950s. These are all countries where low-lying boglands are common. Bog bodies are named after the geographical areas where they were found. Tollund Man and Grauballe Man from Denmark were perhaps the best known of all bog bodies until the discovery of Lindesay Man in England in the 1980s. Other well-preserved bodies have since been found in Ireland, including Cashel Man, the oldest flaked remains found anywhere. It was discovered in a bog near Cashel in County Linn in 2011.



SOURCE 2 Places where bog bodies have been found.

How are bog bodies preserved?

You would expect that bodies deposited in water typical peat bog there in little or no oxygen in its place. Bogs consist of two layers: a thin, watery layer remains constant, undisturbed by any soil. Any archaeological material can remain there to the extent of bogs is also vital to the preservation because that muscle, tissue and tendons are protected from bacteria. As the sphagnum to the staining of the bodies, covering the skin usually very dark brown in colour.

There is great water in the mucous of the skin with no soft tissue, while others have Oetzi the hair, nails and major organs are preserved. Clothing and objects made from wood, skin,

Forensic analysis of the Iceman

In the two and a half decades since the Iceman's remains were discovered, the body and the equipment found with it have undergone thorough forensic analysis. A wide range of specialists have analysed and interpreted hundreds of samples. All have contributed to the ongoing story of the results of these analyses may reveal.

2003 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

2004 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

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2007 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

2008 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

2009 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

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2011 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

2012 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

2013 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

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2015 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

2016 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

2017 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

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2019 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

2020 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

2021 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

2022 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

2023 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

2024 CT scans revealed the Iceman's death had occurred in a fall, as the neck of the body had broken and the skull was severely damaged. The Iceman had died shortly before death.

Many chapters feature a 'Profile' that allows for more in-depth learning about a historically significant person, event or phenomenon.

'Understanding and using the sources' questions throughout each chapter enhance student understanding of how to use and critically analyse historical sources.

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- the ability to use their cloud-based obook anywhere, anytime, on any device.

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- answers to every question in the Student book
- printable (and editable) class tests with answers
- the ability to set up classes, set assignments, monitor progress and graph results, and view all available content and resources in one place.



6

The treatment and display of human remains

FOCUS QUESTIONS

- 1 How have the human remains in this chapter been discovered, removed from where they were found, and preserved?
- 2 What scientific methods have been used to investigate and preserve the remains?
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- 4 What ethical issues are relevant to the treatment, display and ownership of the remains?

FOCUS CONCEPTS & SKILLS

Significance

We place particular importance on events, people and places of the past, and their impact. Our understanding of the past is influenced by the significance of the human remains studied as well as how the scientific analysis and preservation of those remains is conducted. Using this, judgements can be made about the relative importance of evidence in helping to reconstruct these people's lives and their context. It is also important to consider the ethical issues relating to the treatment, display and ownership of ancient human remains.

LEARNING OUTCOMES

- 1 Explain how the human remains in this chapter have been discovered, removed from where they were found, and preserved.
- 2 Analyse what scientific and written evidence reveals about the lives and deaths of ancient people, their societies, health and environment.
- 3 Discuss the ethical issues involved in the treatment, display and ownership of the remains.
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Human remains from the past

Many discoveries of ancient human remains have been made over time. A quick survey of newspapers, archaeological magazines and television documentaries reveals exciting reports of ‘bog bodies’ in Ireland, ‘ice maidens’ in Siberia and Peru, the Iceman in the Austrian Ötztal Alps, mummified Eskimo babies, ancient Chinese mummies of the Tarim Basin and, of course, Egyptian mummies. These ancient human remains have survived for a variety of reasons and historians rely heavily on the work of scientists to unlock their secrets. This chapter focuses on the preservation, analysis, significance and display of human remains. It will investigate bog bodies, particularly Lindow Man and the Iceman, Ötzi.

Bog bodies

From time to time, people have come across preserved bodies in the bogs of northern Europe. The state of preservation of many of these bodies is so good that the discoverers have naturally assumed that they were recent murder victims and the local police have been called to investigate. For example, in England in 1983 a man confessed to the murder of his wife when the partial remains of a human skull were found in a **peat** extraction site at the rear of his house. It was only after scientific investigation was conducted to determine the age of the remains that it became clear that the owner of the skull had died almost 2000 years ago.

The first recorded discovery of a bog body was in the Netherlands in the late 18th century, but people had no doubt found bodies before this as they cut peat from the bogs to use as fuel for their fires. Many were reburied in local cemeteries, as once out of the peat and without artificial preservation, these bodies would have decomposed quickly.

Bog bodies have been dated from the Stone Age to modern times, but the best preserved examples date from the **Iron Age** and Roman periods, when the dominant culture of these regions was **Celtic** (see Chapter 11 The Celts). The reasons why they came to be in the bogs are diverse: accidental death, burial, murder and ritual sacrifice have all been suggested.

Where are bog bodies found?

Bog bodies have been found and recorded in the United Kingdom, Ireland, the Netherlands, Denmark and Germany, especially since the 1950s (Source 2). These are all countries where low-lying boglands are common. Bog bodies are named after the geographical areas where they were found. Tollund Man and Grauballe Man from Denmark were perhaps the best known of all bog bodies until the discovery of Lindow Man in England in the 1980s. Other well-preserved bodies have since been found in Ireland, including Cashel Man, the oldest fleshed remains found anywhere. It was discovered in a bog near Cashel in County Laois in 2011.

■ **peat**
partially decayed
vegetation or
organic matter found
in peatlands or bogs

■ **Iron Age**
an archaeological
era following the
Stone Age and
Bronze Age, and
characterised by
the use of iron for
toolmaking

■ **Celtic**
relating to the
Celts, pre-Roman
inhabitants of Britain
and Gaul

BOG BODY SITES



Source: Oxford University Press

SOURCE 2 Places where bog bodies have been found

How are bog bodies preserved?

You would expect that bodies deposited in water would decompose rapidly. However, in a typical peat bog there is little or no oxygen in the water for chemical processes of decay to take place (Sources 3 and 4). Bogs consist of two layers: a thin, watery top layer, and a thick layer of peat. The peat layer remains constant, undisturbed by any outside changes in the environment. Therefore, any archaeological material can remain there undisturbed for hundreds of years. The chemical content of bogs is also vital to the preservation of human and other organic remains. Scientists believe that muscle, tissue and wooden artefacts survive in the bogs because of **sphagnum**, a polysaccharide (carbohydrate) found in the cell walls of the sphagnum moss that prevents destructive bacteria operating. As the sphagnum moss decays, an acid forms, which contributes to the tanning of the bodies, converting the skin into leather. This is why bog bodies are usually very dark brown in colour.

■ **sphagnum**
a polysaccharide (carbohydrate) in sphagnum moss that contributes to the tanning process

There is great variety in the outcomes of such preservation. Some bog bodies are merely skeletons with no soft tissue, while others have no bones but have soft tissue and tanned skin. Often the hair, nails and major organs are preserved, as well as the contents of the stomach. Clothing and objects made from wool, skin, leather and metal may also have been preserved.

Significance of bogs

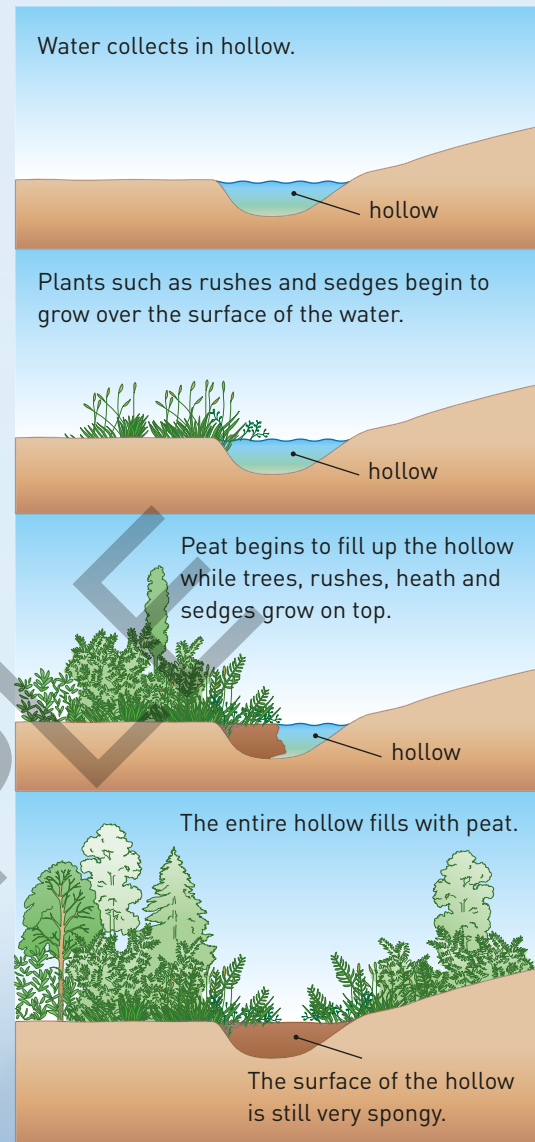
Why bodies were put into bogs remains a contested issue among scholars. Even sources contemporary with Iron Age times do not give a clear answer. Tacitus, the Roman historian, talks about criminals being cast into bogs as punishment, but also suggests that religious ritual may have been involved.

Modern scholarship since the 1950s has explored the cultural practices associated with bog burials. Since **Neolithic** times in northern Europe, bogs have been a source of peat for fuel. However, they appear to have had a supernatural significance as well. Danish villagers, for example, placed not only everyday items such as clothing, weapons and slaughtered animals in bogs, but also more valuable items such as **torcs** or neck rings, bracelets and ankle rings, possibly as religious offerings. At times they also deposited bodies, or parts of bodies, most of which had suffered violent deaths. In Ireland, scholars have suggested that bog burials were associated with kingship rituals and the marking of borders between territories. Other scholars have suggested that bogs were **liminal** zones, areas between heaven and earth or between the realm of the living and the dead, and as such were places to deposit offerings as well as things that were no longer wanted in the visible world.

■ **Neolithic**
relating to the New Stone Age, which began about 10000 years ago

■ **torc**
a collar or neck ring of twisted metal, worn especially by the ancient Celtic tribes of Gaul and Britain

■ **liminal**
relating to an intermediate stage between two states or conditions



SOURCE 3 The formation of a peat bog

SOURCE 4 Blanket peat bog moorland in the Peak District National Park, England



Scientific analysis of bog bodies

Today, more is known about bog bodies than when they were first studied in the 1950s. This is largely due to the advances in medical and forensic techniques. The cause of death of some bodies is now known with more certainty, as well as the age at death and when the body was put into the bog. Some bodies have even had to be reclassified when **DNA** testing revealed new information. For example, the body originally known as Windeby Girl is now known to be that of a 16-year-old boy.

■ **DNA**
(deoxyribonucleic acid)
a self-replicating genetic or hereditary material present in nearly all living organisms



SOURCE 5 (a) The Osterby skull, showing the distinctive hair knot worn by this bog body. (b) The head of Windeby I, showing its blindfold and shaved head. (c) The face of Grauballe Man. (d) The remains of Tollund Man on display in the Silkeborg Museum, Denmark. The cap and the noose around the neck can be seen clearly. Only the head was preserved; the rest is a reconstructed model.

More recently, developments in **strontium isotope tracing technology** have made it possible to detect strontium isotopes in human hair and skin, indicating where some of the bog people had lived in the last few years of their lives. Contrary to the traditional view that the bog bodies were local to the bogs in which they were found, this evidence reveals that some of these people had travelled abroad and that some may have been of high social status. Textile analysis conducted by Ulla Mannering, an expert in ancient textiles at the National Museum of Denmark, indicates that the woollen clothing worn by Huldremose Woman (see Source 6) had been dyed, a clear indication of her wealth. Mannering's colleague Karin Margarita Frei has carried out research suggesting that trade and travel were much more widespread than previously thought. Another Iron Age expert, Lotte Hedeager from the University of Oslo in Norway, argues that the results of this research call for a reinterpretation of the communication and trade networks among these early Iron Age Europeans.

■ **strontium isotope tracing technology**
a technique by which strontium isotopes in human hair and skin can indicate regions where people have lived

Famous bog bodies

To date, more than 500 bog bodies and skeletons have been discovered in Denmark, with many others in Germany, the Netherlands, the United Kingdom and Ireland. Source 6 records some of the bog bodies that have been found, their main features, and some information that scientific examination has revealed about them.

SOURCE 6 Selected bog bodies

NAME, DISCOVERY DATE AND PLACE	RADIOCARBON DATE	POSSIBLE CAUSE OF DEATH	FEATURES
Huldremose Woman, 1879, Jutland, Denmark	160 BC – 340 AD	Insufficient evidence	Lacerations to the feet; right arm nearly severed from the rest of the body before it was deposited in the peat; rope around the neck; last meal – rye bread; body clothed in a cape, scarf and skirt
Yde Girl, 1897, Drenthe Province, the Netherlands	54 BC – 128 AD	Strangulation with a braided woollen band still around the throat	A wound near the left shoulder blade probably inflicted with a knife; remains of a large, worn, woollen cloak; CT scan revealed scoliosis ; age at death, 16 years
Elling Woman, 1938, Bjeldskovdal bog, Silkeborg, Denmark	350 – 150 BC	Hanging or strangling with a leather thong	Wrapped in a sheepskin cape and with a leather cloak tied around the legs; a woven belt around the waist; elaborately knotted plait of hair
Borremose Man, 1946, Himmerland, Denmark	c. 700 BC	Hemp rope around neck; blow to back of skull	In sitting position; black leathery skin; body naked with two sheepskin coats and a woven cap nearby; hands showed no hard labour; stomach contained remnants of vegetable soup
Borremose II female, 1947, Himmerland, Denmark	475 BC	Insufficient evidence	Upper body naked, shawl and cloak covering lower body; remains of an infant nearby; leg fractured below knee; amber beads and bronze disk around neck; body covered by three birch poles
Tollund Man, 1950, Bjeldskovdal bog, Silkeborg, Denmark	c. 375 – 210 BC	Hanged by noose around neck	Wearing a sewn skin cap; clean-shaven; 30 to 40 years of age at death; 1.6 m tall; internal organs intact; last meal – soup of barley and seeds (wild and cultivated); died late winter or spring
Windeby I, 1952, Schleswig-Holstein, Germany	41 BC – 118 AD	Possible drowning	16 years old; hair missing from left side of head due to early exposure to oxygen; woollen band across eyes possibly hair band rather than blindfold; body covered by birch branches and rocks; suffered several stoppages of growth during life
Grauballe Man, 1952, Jutland, Denmark	c. 290 BC	Throat cut from ear to ear	About 30 years old at death; naked; last meal – porridge of corn, weed seeds and grasses, with traces of the poisonous fungus ergot , eaten immediately before death; died in winter or early spring; hands show no manual labour
Lindow Man (Lindow II), 1984, Lindow Moss, Cheshire, UK	2 BC – 119 AD	Blows to head; garrotted; throat cut; stab wound to chest	About 25 years old at death; naked to waist; moustache trimmed with shears; short beard; fox fur armband; last meal – bread with bran
Old Croghan Man, 2003, County Offaly, Ireland	c. 300 BC	Torture and beheading	Tallest bog body found (1.91 m); plaited leather band on left arm; last meal – buttermilk and cereals; meat-based diet in months before death; polished manicured nails; nipples cut
Clonycavan Man, 2003, County Meath, Ireland	c. 300 BC	Severe head wound and disembowelling	High, sweeping hairdo; use of hair gel made from resin ; summer death; vegetable diet before death; moustache and goatee beard
Cashel Man, 2011, County Laois, Ireland	c. 2000 BC	Undetermined (back injuries now considered caused post mortem)	About 20 to 25 years old at time of death; broken arm; two hazel rods either side of body marked the location or kept the body in place

6.1 Understanding and using the sources

Look at the table in Source 6.

- 1 What were the main causes of death?
- 2 What is interesting about the nature of the stomach contents? What questions arise from this?
- 3 What items of clothing or adornment have been found? What is their significance?
- 4 List the features that the bodies have in common. How might these help us to explain the possible circumstances of their deaths?
- 5 The majority of these bodies have been dated to Iron Age times. What evidence in the table indicates that the practices described began much earlier than this period?

6.1 Check your learning

- 1 Find out more about these bog bodies and others that you find interesting. Some useful online resources include:
 - the Silkeborg Museum (Tollund Man)
 - the National Museum of Ireland (Kingship and Sacrifice exhibition)
 - Wikipedia, which has some very useful information and a list of all known bog bodies.
- 2 Compile a picture file of your favourite bog bodies using Google Images.
- 3 Conduct some further research on what strontium isotope tracing technology has revealed about bog bodies. What impact has this research had on theories about social status, trade and the movement of people? Read the online *National Geographic* article 'Who were the ancient bog mummies?'
- 4 Bog bodies have also been found in peat bogs in the United States. These human remains are considerably older than those found in Europe. Find out more about them by reading the online article 'America's Bog People' by Peter Tyson on NOVA Online.

■ **CT scan**
computed tomography scan; an imaging method using digital geometry processing to produce a 3D image of the inside of an object or body

■ **scoliosis**
a medical condition in which a person's spine has a sideways curve

■ **ergot**
a plant disease caused by a fungus

■ **resin**
a sticky, organic substance exuded by some trees and other plants; used as a glue in the mummification process

■ **post mortem**
literally, after death



SOURCE 7 Endoscopic examination of Tollund Man's head at the National Museum of Denmark

The case of Lindow Man

Lindow Man (or Lindow II, to use the official name) was discovered in 1984 in a peat bog called Lindow Moss in Cheshire, England. Two workmen cutting peat found a foot in a piece of machinery. The torso of the body was revealed in the remaining peat. The police were called, as well as an archaeologist, Rick Turner, who soon established that it was part of an ancient bog body. In 1988, more parts of what are now considered to be Lindow Man's body were discovered: the skin of the buttocks, part of the left leg, and both the right thigh and femur.

A visual examination by the investigators revealed that Lindow Man had been 25 to 30 years old, muscular and at the peak of physical condition. He was about 1.65 metres tall and would have weighed approximately 60 to 65 kilograms. Even though the head was distorted as a result of the weight of the peat, they observed that it had brown to ginger hair, and a moustache and beard of similar colour. Both were neatly trimmed, the ginger colour probably caused by the peat. The hands were manicured and well cared for, which suggests that he did little physical work. The neck and torso of the body bore the marks of stab wounds and the body was naked, except for a fox fur armband.

Modern preservation of the remains

After the scientific examination of Lindow Man's remains had taken place and samples had been taken, the next step was their preservation. Scientists decided to freeze-dry the body, as success had been achieved with this method on other ancient materials. The technique involved an initial soaking of the body in **polyethylene glycol** to prevent distortion, then freezing it and vaporising the ice. Lindow Man's body suffered only minimal shrinkage as a result of the process. Following this, it was placed in a purpose-built display case with a controlled environment.

■ **polyethylene glycol**
the main chemical
component of
antifreeze



SOURCE 8 Lindow Man on display in the British Museum

Methods and results of scientific analysis of Lindow Man

Paleopathology is the investigation of ancient human remains to reveal disease and illness. The scientific or paleopathological examination of Lindow man has used a variety of techniques which have revealed his last meal and manner of death among other things. Some of these are summarised in Source 9.

SOURCE 9 Scientific analysis of Lindow Man

SCIENTIFIC TECHNIQUE	INFORMATION REVEALED	SIGNIFICANCE
Scanning electron microscopy – uses an electron microscope that produces high-resolution, three-dimensional images	Beard and moustache hairs had 'stepped' ends.	This indicated that they had been trimmed with fine shears or scissors rather than with a single knife or razor blade.
	The stomach contained sphagnum moss spores, crushed wheat, bran, barley grains and mistletoe pollen.	Mistletoe pollen in the stomach suggests an association with Druidic practice because it was commonly used in their rituals.
	Eggs of roundworms and whipworms were present in his stomach.	Body was infested with parasitic worms but not severely enough to affect health.
Electron spin resonance (ESR) spectroscopy – examines changes in molecular structure to determine exposure to heat	Bran and charcoal fragments were found.	This suggests burnt griddlecake had been eaten before death. Further speculation exists as to whether the burnt material was deliberately ingested or eaten by accident.
Atomic absorption spectrometry – determines the composition of elements in a sample	His torso skin had a higher copper content than skin samples from other parts of his body.	This suggests that copper pigments might have been applied as body paint.
Radiocarbon dating (see Chapter 1)	The body is now thought to be in a date range of 2 BC to AD 119.	Lindow Man is generally believed to be from the Iron Age. Speculation exists as to whether he lived during the Roman occupation of Britain.
Xeroradiography – a form of X-ray in which a picture of the body is recorded on paper instead of on film	The body had received a blow to the head causing a V-shaped cut on the surface and a fracture to the skull. Bone fragments were driven into the brain. Swelling was observed along the edges of the wound.	The wound was caused by a blunt instrument, possibly an axe. The swelling indicated that Lindow Man had survived the blow, possibly for several hours, but probably in an unconscious state.
Computed tomography or CT scan – uses X-rays and digital computer technology to create detailed images of the inside of the body	The brain showed evidence of swelling and bruising.	As with the xeroradiographs, this suggests that he was alive for some hours after sustaining the fatal injury.
	Schmorl's nodes were observed.	He appears to have had mild osteoarthritis .

■ **paleopathology**
a branch of pathology concerned with ancient diseases, e.g. in fossils or human remains

■ **Druidic**
relating to the ancient Druids, a pre-Christian religious order among the ancient Celts of Gaul, Britain and Ireland

■ **griddlecake**
a thin cake made from a batter cooked on a hot griddle or frying pan

■ **pigment**
a natural substance that gives colour to animals and plants

■ **radiocarbon dating**
a method of determining the age of organic material by analysing the amount of carbon-14 remaining in a sample

■ **Schmorl's nodes**
protrusions of the cartilage of the spinal discs

■ **osteoarthritis**
a joint disease resulting from a breakdown of joint cartilage and underlying bone

How did Lindow Man die?

Forensic analysis has revealed the particularly horrific manner of Lindow Man's death. His death resulted from:

- two or three blows, possibly from a blunt instrument such as an axe, that fractured the skull
- a blow to the back, which broke a rib
- strangulation or garrotting with a thong made of animal sinew
- a cut throat, perhaps not to cause death but to drain the body of blood
- a possible stab wound to the upper chest.

Using written sources to explain Lindow Man's death

Written sources may be of use to unravel the mystery of Lindow Man's death. The following extracts are from writers who lived around the time of Lindow Man:

- Tacitus, a Roman writer from the 1st century AD who observed and described the customs of ancient Celtic tribes in his work *Germania* (Source 10)
- Strabo, a Greek historian, geographer and philosopher from the 1st century AD who wrote *Geographica* (Source 11), an encyclopedia of geographical knowledge
- **Julius Caesar**, a Roman politician and general (101–44 BC) who recorded his observations of Celtic tribes in the records of his Gallic campaigns, *Commentarii de Bello Gallico* (Source 12)
- Diodorus Siculus, a Greek historian from the 1st century BC whose *Bibliotheca historia* (a universal history) covers a period from mythology to the death of Alexander the Great (Source 13).

■ **Julius Caesar**
a significant Roman
general and
statesman of the late
Roman Republic

SOURCE 10

The nature of the death penalty differs according to the offence: traitors and deserters are hung from trees; cowards and poor fighters and sexual perverts are plunged in the mud of marshes with a hurdle [covering of sticks] on their heads.

At fixed seasons all tribes of the same name and blood gather through their delegations at a certain forest ... And after publicly offering up a human life, they celebrate the grim 'initiation' of their barbarous worship. There is a further tribute which they pay to the grove: no one enters it until he has been bound with a cord ...

These tribes are protected by forests and rivers, nor is there anything noteworthy about them individually, except that they worship ... Mother Earth ... In an island of the ocean is a holy grove, and in it a consecrated chariot, covered with a robe: a single priest is permitted to touch it: he feels the presence of the goddess in her shrine, and follows with deep reverence as she rides away drawn by cows: then come days of rejoicing ... as many as she thinks worthy to receive and entertain her. They make no war, take no arms ... until the same priest returns the goddess to her sacred precinct, when she has had her fill of the society of mortals. After this the chariot and the robe, and ... the deity in person, are washed in a sequestered lake: slaves are the ministrants and are straightway swallowed by the same lake.

Tacitus, *Germania*, 12, 39, 40

SOURCE 11

The Romans put a stop ... to ... sacrifice and divination, as they were in conflict with our own ways: for example, they would strike a man who had been consecrated for sacrifice in the back with a sword, and make prophecies based on his death-spasms; and they would not sacrifice without the presence of the **Druids**. Other kinds of human sacrifices have been reported as well: some men they would shoot dead with arrows and **impale** in the temples; or they would construct a huge figure of straw and wood, and having thrown cattle and all manner of wild animals and humans into it, they would make a burnt offering of the whole thing.

Strabo, *Geographica*, 4.1.13

■ **Druid**
a priest of the ancient Celtic religion

■ **impale**
to pierce or transfix with a sharp instrument

■ **Gaul**
the Latin name for France in Roman and Celtic times

SOURCE 12

All the people of **Gaul** are completely devoted to religion, and for this reason those who are greatly affected by diseases and in the dangers of battle either sacrifice human victims or vow to do so using the Druids as administrators to these sacrifices, since it is judged that unless for a man's life a man's life is given back, the will of the immortal gods cannot be placated. In public affairs they have instituted the same kind of sacrifice. Others have effigies of great size interwoven with twigs, the limbs of which are filled up with living people which are set on fire from below, and the people are deprived of life surrounded by flames. It is judged that the punishment of those who participated in theft or brigandage or other crimes are more pleasing to the immortal gods; but when the supplies of this kind fail, they even go so low as to inflict punishment on the innocent.

Julius Caesar, *Commentarii de Bello Gallico*, 6.16

SOURCE 13

They [the Gauls] also observe a custom which is especially astonishing and incredible, in case they are taking thought with respect to matters of great concern; for in such cases they devote to death a human being and plunge a dagger into him in the region above the diaphragm, and when the stricken victim has fallen they read the future from the manner of his fall and from the twitching of his limbs, as well as from the gushing of the blood, having learned to place confidence in an ancient and long-continued practice of observing such matters.

Diodorus Siculus, *Bibliotheca Historica*, 5.31.3



Contested modern interpretations

Scholars and scientific experts have reached different conclusions about Lindow Man and his death. Dr Anne Ross and Rick Turner, for example, argue that Lindow Man was a ritual sacrifice. Robert Connolly takes a different view, as revealed in Source 15.

Archaeologists have noted the connection between the manner of Lindow Man's death and the festival of Beltane as described in the ancient sources. This was a festival held by the Celtic tribes, usually on the 1st of May (spring in the northern hemisphere). It was held in times of great danger, such as the failure of crops or attack by the Romans. The tribes sought help from the sun god Belenos by offering him a human sacrifice.

Celtic scholars have established that at this festival, a special bread was prepared, one portion of which was deliberately burnt. The bread was given out, and whoever received the burnt portion was 'the devoted one'; that is, given to the gods in human sacrifice. As we have seen earlier, forensic examination of the contents of Lindow Man's stomach revealed that his last meal consisted of burnt griddlecake. This has led Dr Ross, a Celtic archaeologist, to conclude that it had ritual significance.

The scientists also examined the botanical evidence of the peat bog. Considering the evidence, together with the grains of cereal found in the stomach, they concluded that Lindow Man must have died in winter or early spring. Others interested in Celtic customs note Lindow Man's death by three methods: strangulation, bludgeoning and throat-cutting. They see this as part of a religious symbol called 'triplism', the superstitious concept that events occur in groups of three. Other links to Celtic religion include the presence of mistletoe pollen in the stomach and the possibility that he wore body paint. Mistletoe was considered sacred by the Celts for its healing powers, while body painting was associated with warfare.

The **opinion** of Rick Turner, the first archaeologist to examine Lindow Man's remains, about Lindow Man and the other remains found at Lindow Moss between 1983 and 1988 can be read in Source 14.

SOURCE 14

... the most likely explanation for these two bodies is that they represent ritual sacrifices, probably for religious reasons, just before or during the first half of the Roman occupation of Britain. As such, they belong to a phenomenon well established across northern Europe and now well documented in Britain and Ireland.

R. C. Turner, 'The Lindow Man phenomenon: ancient and modern', in R. C. Turner & R. G. Scaife (eds), *Bog Bodies: New Discoveries and New Perspectives*, London: British Museum Press, 1995, p. 189

SOURCE 15

Is there then enough evidence to write 'ritual sacrifice' into the anthropology of Iron Age Cheshire? My belief is we are more likely witnesses after the crime of an Iron Age mugging or death from combat. Whether he was fighting naked or his clothes have degraded without trace is open to question. If, as is suggested by his hair, nails and bodily **habitus**, he was more than a simple peasant, then perhaps his clothes were worth taking either by his assailant or some other person or persons unknown; but absence of preserved clothes does not confirm ritual.

R. C. Connolly, 'Lindow Man: Britain's prehistoric bog body', *Anthropology Today*, vol. 1, issue 5, 1985, p. 17

■ **opinion**

a person's belief, judgement or way of thinking about something that is not necessarily substantiated by facts

■ **habitus**

a person's physical characteristics, especially appearance and constitution

6.2 Understanding and using the sources

- 1 Use Sources 10 to 15 to answer the following questions:
 - Briefly explain what each source says about Celtic customs (see Chapter 11).
 - What comment would you make about Tacitus' description of these practices as 'barbarous worship'?
 - List the references in the sources that could apply to the manner of Lindow Man's death.
 - How reliable do you think these sources are? Why? (Consider who the authors are, the time of writing, their audiences and purposes.)
 - How useful do you think these sources are for an understanding of Lindow Man's life and death?
 - 2 Using Sources 14 and 15, compare the arguments of Turner and Connolly. Which is more persuasive and why?
-

What did Lindow Man look like?

Forensic science has been able to reconstruct Lindow Man's appearance. Source 8 shows Lindow Man's face, squashed and contorted from the weight of the peat. However, medical illustrator Richard Neave was able to reconstruct the face of Lindow Man. He used templates made from X-rays of the skull from which the distortions had been removed. He then sculpted a skull from clay over these templates. Even though this was a significant new technique at the time of Lindow Man's discovery, it has now been superseded by the use of CT scans and **computer-generated imaging (CGI)**.

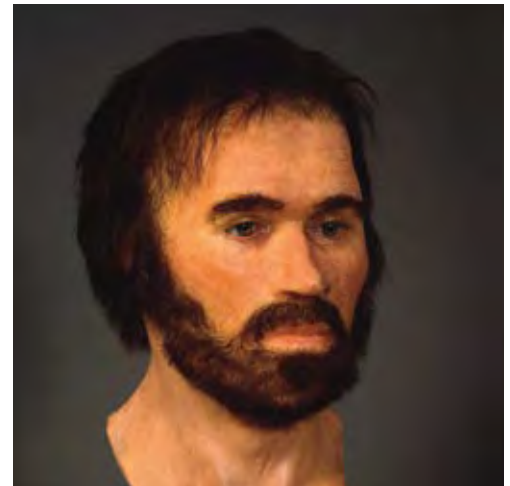
■ **computer-generated imaging (CGI)**

the application of computer graphics to create or contribute to images in a variety of media

■ **reliability**
the accuracy of a source judged on its context, purpose, origin and intended audience

6.2 Check your learning

- 1 Compare Lindow Man's injuries with those listed in Source 6. In what ways is the manner of his death similar to those of other bog bodies? Why is this significant?
- 2 Find out more online about Lindow Man's manner of death.
- 3 Research the techniques used by Richard Neave to reconstruct the face of Lindow Man. Compare these with the computer-generated images made of Tutankhamun's head following the 2005 scientific examination (see Chapter 3). What conclusions can you draw about the relative **reliability** of these different techniques?
- 4 Find out more about the research carried out on Lindow Man's remains. For example, you could investigate the problems associated with dating Lindow Man's remains, or the techniques used to preserve them. Two excellent resources are:
 - 'Peat stratigraphy and the age of the Lindow bodies', in R. C. Turner and R. G. Scaife (eds), *Bog Bodies: New Discoveries and New Perspectives* by P.C. Buckland
 - *Lindow Man* by J. Joy.
- 5 Use the information in this chapter and your own research to write a response to the following: 'Explain what scientific analysis and written sources reveal about the life and death of Lindow Man.' (Explain: Make relationships clearly evident, give cause and effect, provide why and/or how.)



SOURCE 16 A model of Lindow Man's head made in the 1970s by Richard Neave of Manchester University, using X-rays of the skull

To help you plan your response:

- identify relevant aspects of Lindow Man's life and death, e.g. diet, occupation etc.
- use these aspects to structure your answer (Note: avoid a purely narrative structure)
- identify the scientific techniques used to examine Lindow Man's remains and draw conclusions about what they reveal about his life and death
- identify the written sources and draw conclusions about what they reveal about his life and death
- use specific evidence to support your explanation.

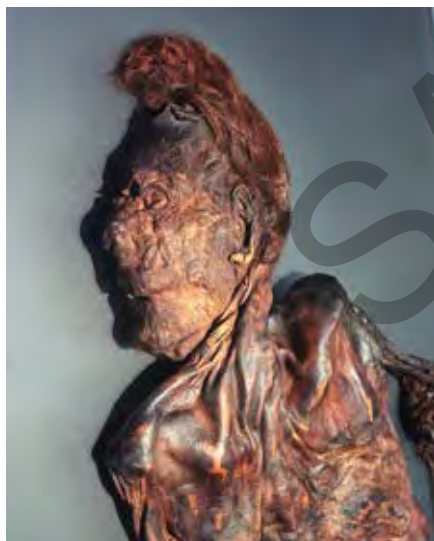
Hint: A good strategy would be to consider the extent to which the scientific analysis **corroborates** the written evidence.

■ **corroborate**
support or confirm

6.2 Profile

Irish bog bodies

In 2003, two more bog bodies were discovered in Ireland during peat-cutting activities. Both bodies are male, are more than 2000 years old and appear to have been the victims of a ritual sacrifice, indicated by signs of torture before their deaths. The bodies have been named Clonycavan Man and Old Croghan Man after their places of discovery, just 40 kilometres apart. In 2011, a further discovery was made by a milling machine operator at Cashel bog, in County Laois. This body, also male, is over 4000 years old and, like the others, appears to have been the victim of ritual sacrifice. The bodies have undergone extensive forensic examination at the National Museum of Ireland.



SOURCE 17 Clonycavan man

Clonycavan Man

Unfortunately, the peat-cutting machine had cut off the forearms, hands and lower abdomen of Clonycavan Man. Despite this, it was possible to determine that it was a young man of short stature, no more than 1.6 metres. The most striking feature of this body was its hairstyle. Clonycavan Man had used a substance made of vegetable plant oil mixed with a resin to sweep his hair up on top of his head. The resin came from pine trees found in Spain and south-west France, providing evidence of Iron Age trade across Western Europe.

Beneath the hairdo was evidence of the cause of death – a huge wound made by a heavy, sharp implement that had sliced open the skull. There was a slash across the cheekbone, as well as evidence of a blow to the chest and disembowelment. Analysis of the hair showed that Clonycavan Man had eaten mainly vegetables before death, which suggests that it occurred in the summer.

Old Croghan Man

Old Croghan Man was a young man in his early to mid 20s. Although the body was missing its head and lower limbs, it was possible to calculate its height from the length of the arms. When alive he would have been about 2 metres tall, making him the tallest bog body found in Europe. The body was found naked except for a band of plaited leather around the left arm.



Old Croghan Man's remains revealed evidence of savage torture before death. His nipples had been cut and he had been stabbed in the ribs. A cut on his arm was probably a defence wound, made as he tried to fend off his killer. Holes were cut in his upper arms through which a rope made of hazel was threaded, possibly to restrain him. Final mutilation included beheading and cutting the body in half across the torso.

Stomach remains indicate that milk and cereals had been consumed as a last meal. However, chemical analysis of polished and manicured nails showed that his diet was rich in meat, unlike that of Clonycavan Man. It is likely that he died in the winter when vegetables were not readily available.

SOURCE 18
Old Croghan Man

Cashel Man

The body of Cashel Man was missing the head and left arm when found. The young man of 20–25 years had been placed in the peat in a crouching position with his arms holding his legs. Unfortunately only the legs were well preserved, the rest of the body having decomposed within the skin. When the head was later recovered it was found to have closely cropped hair. In what seems to have been a violent struggle to survive, Cashel Man sustained a defence wound to his arm before having one arm broken by a blow from a sharp object, possibly the sword that could have been used to cut him across the back.

Who were these bog bodies?

Many Irish bog bodies have been found buried on important political or royal boundaries. **Votive objects** such as feasting equipment, weapons, royal clothing and objects relating to processions with horses have also been found in boundary locations. This has led to a theory that the bodies and the offerings were related to kingship rituals. Eamonn Kelly, former Keeper of Irish Antiquities at the National Museum of Ireland, thinks that the three bog bodies discussed here were kings. He points out that a king's role was to ensure the safety of the people and their cattle from disease. If he failed in this duty he would be sacrificed. Source 19 gives his view of the connection between these bodies and the rejected rulers.

■ **votive objects**
objects offered to gods as an appeal for divine favour

SOURCE 19

We're looking at the bodies of kings who have been decommissioned [removed from office], who have been sacrificed. As part of that decommissioning, their nipples are mutilated. In the Irish tradition they could no longer serve as king if their bodies were mutilated in this way. This is a decommissioning of the king in this life and the next.

Matt McGrath, 'World's oldest bog body hints at violent past', *BBC News*, 24 September 2013

6.2 Profile tasks

- 1 Read Eamonn Kelly's detailed online account of Cashel Man, 'The bog body from Cashel Bog, Co. Laois'.
- 2 Visit the National Museum of Ireland's 'Kingship and Sacrifice' webpage.
- 3 Suggestion for a historical investigation: Research the cultural and religious practices of Irish and other northern European Celtic societies. Compare and contrast them.

6.3

Ötzi the Iceman

■ Similaun

a mountain in the Ötztal Alps on the Austrian-Italian border

■ glacier corpse

the remains of a person who has died and been frozen in a glacier

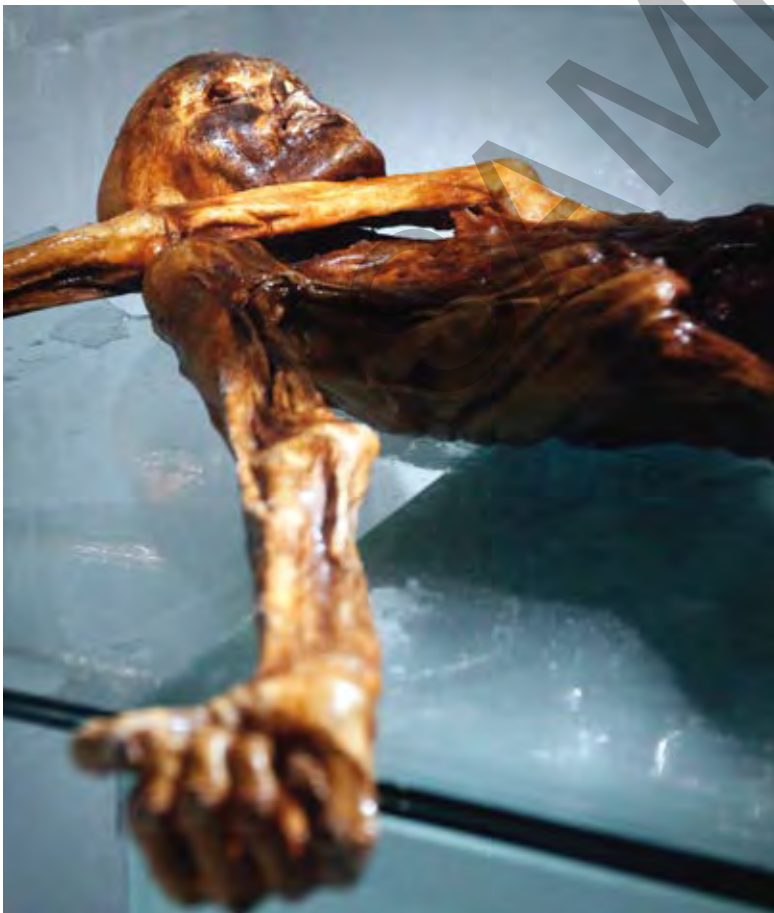
■ genome mapping

a method used by scientists to locate features of a genome (an organism's complete set of genetic instructions)

The Iceman, or Ötzi as he is often referred to, has been arguably the most significant discovery of ancient human remains in the recent past (Source 20). The examination of the artefacts found with the body has extended our knowledge of the lifestyles of Neolithic people. Perhaps more significantly, the scientific analyses of the body have revealed previously unknown information about human genetics and disease.

Like many great archaeological discoveries, the Iceman was a chance find. On 19 September 1991, Erika and Helmut Simon were hiking in the Ötztal Alps between Austria and Italy. Returning from an expedition to the **Similaun** peak, they left the marked track and found the remains of a body sticking out of the ice. Fortunately, they took a photograph, the only one that exists of the Iceman as it first appeared to modern eyes.

When the police were notified, they presumed the body to be that of a normal **glacier corpse**. However, after its enthusiastic but careless recovery from the ice, the remains were deemed to be ancient. They were taken to the forensic medical unit in Innsbruck, Austria, where Professor Konrad Spindler of the Institute of Pre- and Protohistory at the University of Innsbruck was called in to take charge of what was to become a long-term investigation involving hundreds of scientists from a wide variety of fields.



SOURCE 20 The body of Ötzi the Iceman

Scientific analysis of the Iceman

The initial scientific examination of the Iceman focused on determining the age of the body and the cause and manner of death. Specialists were keen to determine where the Iceman came from, why he was on the mountain and how he had been so well preserved. They also wanted to know exactly how old the remains were. In addition, they were interested in studying the more than 70 personal possessions that were found with the body, including clothing, tools and weapons, and participating in their identification and conservation.

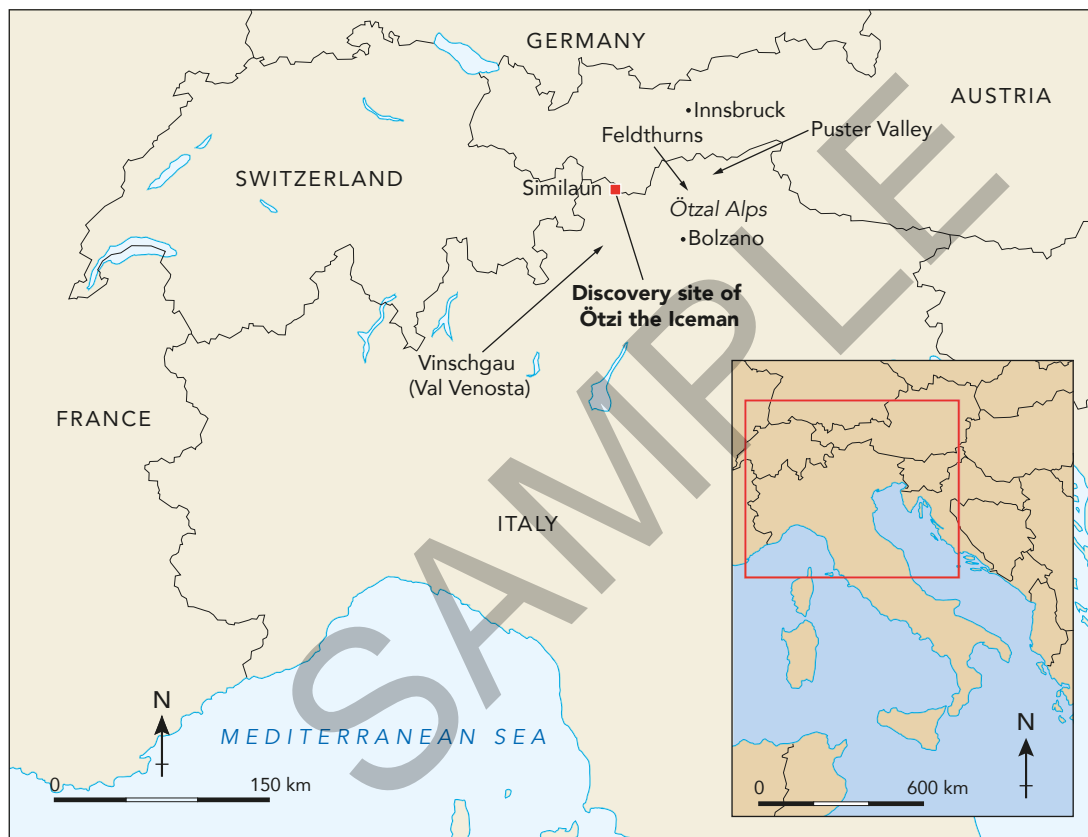
In more recent times, there has been a greater focus on the body itself. Technological advances such as the harvesting of ancient DNA and **genome mapping** have revealed more information than was probably ever imagined possible in the years immediately after the discovery.

Who was the Iceman?

In 1994, Konrad Spindler concluded that the Iceman was a shepherd who probably came from a Neolithic settlement in the Val Venosta, an alpine valley in northern Italy, approximately 20 kilometres from where he was found. His theory was based on the Iceman's age, strong physique, equipment, clothing and place of death (a route by which herds would cross the main ridge of the Alps). Since then, the **isotopic** composition of his tooth enamel and bones has been examined. The results indicate that the Iceman was born in the South Tyrol near the village of Feldthurns. His childhood was probably spent in the Eisack or Puster valleys, but he seems to have spent his last 10 years in the Vinschgau (Val Venosta in Italian).

■ **isotopic**
in this context, relating to the isotopes of dental tissue, which can be analysed to reconstruct diet and geographical origin of ancient human remains

KEY LOCATIONS OF THE ICEMAN



Source: Oxford University Press

SOURCE 21 This map shows where the Iceman was born, where he lived and where he was found.

How old is the Iceman?

Konrad Spindler initially estimated that the Iceman lived in the early **Bronze Age**, about 2000 BC (roughly 4000 years ago). He drew this conclusion based on his observation of the axe found with the corpse. Spindler assumed that it was made of bronze because the design of its blade was characteristic of Bronze Age axes. Chemical analysis, however, proved that the axe was made of copper. The Iceman therefore belonged to an earlier time, the **Chalcolithic**, or Copper Age, which lasted in Europe from c. 4000 to 2200 BC.

Radiocarbon dating of the body was carried out, using minute samples from the bone and tissue of the hip. Other radiocarbon tests were done on grass samples found with the body. The average result of these tests showed that the Iceman lived approximately 5300 years ago.

■ **Bronze Age**
a historical age characterised by the use of cast bronze to make tools and weapons

■ **Chalcolithic**
the Copper Age

The Iceman's equipment

The Iceman was found with many pieces of equipment, shown in Source 22. These included a **bow stave**, an axe, parts of a back **pannier**, two birch-bark containers, a dagger with **scabbard**, a **retoucheur**, a net, and a quiver with the makings for several arrows.

SOURCE 22 A catalogue of the Iceman's equipment

ARTEFACT	BRIEF DESCRIPTION
Bow stave	Unfinished, made of yew wood, 182 cm long
Axe	Handle of yew wood, blade of copper, held together with bindings of leather
Back pannier	Frame of hazel wood, sack of fur
Birch-bark container (1)	Flattened tube of bark with remains of charcoal and green leaves inside, 20 cm x 10 cm
Birch-bark container (2)	Empty, cylindrical box, oval bottom, 18 cm x 20 cm
Quiver and arrows	Rectangular deer hide sack, stiffened with rod of wood with a closing flap; two arrows found completed, 12 unfinished arrows
Net	Cords of grass 1.8 mm thick with holes 5 cm wide
Dagger with scabbard	Two cutting blades with flint blade and ash wood handle; scabbard intricately plaited from bast , 12.8 cm
Retoucheur	Stub of lime-wood branch with a piece of stag antler driven through the centre; used for sharpening flint blades
Belt pouch	Small calfskin bag like a 'bum bag', containing implements for sharpening flint and bone tools

■ **bow stave**
a wooden rod, trimmed for using as a bow

■ **pannier**
a large container carried over the shoulder

■ **scabbard**
a sheath for the blade of a sword or dagger

■ **retoucheur**
a tool use to sharpen a flint blade

■ **bast**
the fibrous inner bark of a tree, used as fibre in matting or cord

The Iceman's clothing

Interpretations of how the items of the Iceman's clothing were worn and used have changed since the early days of examination. Following is a description of the garments:

- The *leggings* are made of goat and sheep hide and taper downwards, ending in sewn-on, oblong tongues. These were pushed into the shoes and tied on. Sewn on at the top are double supporting straps to knot the leggings to the belt. The hide was worn fur side out. They show signs of heavy wear and repair.
- The *loincloth* was worn over the belt and the leggings. Slipped under the belt, it hung freely to the knees. It is made of narrow strips of sheep hide scraped thin and stitched together. Its overall length was approximately 1.8 metres.
- The *upper garment* is the least well preserved: only one third of it survives. It is made of tanned goat and sheep hide. Alternating brown and black pieces of fur were neatly sewn together with animal sinew creating a vertical pattern of stripes. The sleeve design is unknown because no sleeves were preserved. The garment has seen a lot of wear and bears evidence of mending by an unskilled hand.
- The *three large sections of plaited grass* were originally thought to have been a cape that he wore over his clothing. Problems with fit and practicality became apparent; imagine trying to wear a backpack over a rain cape. The latest theory is that he wore the matting over his head fastened with string to protect him from rain. Modern herders still use grass matting in this way.
- The *bearskin cap*, shaped like a blunt cone, is made of strips of hide sewn together. It has two leather chinstraps for keeping it in place, but both were torn before the Iceman's death.
- The *shoes* consist of two upper parts: an outer shell made of deerskin and an inner lining of grass netting into which grass could be stuffed to act like socks. Both uppers were attached to a bearskin sole with leather straps and the ankles were bound with grass. A recent theory suggests that they were the upper parts of snow shoes, the fragmentary pieces of the back pannier forming the base.



SOURCE 23 The Iceman's shoes

■ **sloe berry**
the small, sour, purple fruit of the blackthorn shrub

■ **periodontitis**
inflammation of the gums

■ **atherosclerosis**
a disease of the arteries in which fatty material builds up inside the arterial walls

■ **histological**
referring to the study of the form of structures that can be seen under the microscope

■ **biochemical**
to do with the chemical processes that occur in living organisms

■ **multispectral imaging**
a type of digital imaging using information from electromagnetic radiation and other waves passing through or bouncing off objects to create images

■ **endoscopy**
a medical procedure in which an instrument is introduced into the body to allow an inside view

■ **subclavian artery**
one of two arteries located below the clavicle (collarbone) that supply our arms with blood

6.3 Understanding and using the sources

- 1 Copy the table in Source 22, adding two columns headed 'Possible uses' and 'Information revealed about the Iceman'. Fill in these columns with your own conclusions drawn from the evidence.
- 2 Answer the following questions using the text and Sources 22 and 23.
 - How well equipped was the Iceman to defend himself, gather food and keep warm?
 - What do the Iceman's equipment and clothing suggest about his lifestyle?
 - How suitably clothed was the Iceman for the region in which he lived and the lifestyle he seems to have led?
 - Make a list of a modern hiker's equipment and clothing (e.g. a backpack, a weatherproof jacket). What similar equipment did the Iceman have?
 - What does this comparison suggest about the Iceman's preparedness for his environment and lifestyle?

6.3a Check your learning

- 1 Archaeologists have been puzzled by the finding of a **sloe berry**, a stone bead with tassles and two pieces of birch fungi. Investigate how archaeologists explain why they were in the Iceman's possession and what they might have been used for.
- 2 Find out about the types of wood that were used for making the Iceman's tools: yew, hazel, ash, lime. What does their use tell us about the knowledge and skill of the craftsmen who made them?
- 3 Find out more details about the Iceman's clothing, equipment and lifestyle, including the latest information, on the South Tyrol Museum of Archaeology's website.
- 4 The Iceman's copper axe has played a significant role in dating his remains as well as the information this artefact can yield about his occupation and social status. Find out more about the axe and its Italian origins on the South Tyrol Museum of Archaeology website. Also read the article 'Ötzi – a treacherous murder – with links to Central Italy' on the same website (under 'News & Events').
- 5 Use the information in this chapter and your own research to write a response to the following: 'To what extent was the Iceman clothed and equipped appropriately to live and work in his environment?' (Assess: Make a judgement of value, quality, outcomes or results.)
To help you plan your response:
 - identify the key features of the Iceman's clothing and equipment (e.g. provided warmth, enabled hunting)
 - use these features to structure your answer (Note: Avoid a purely narrative structure.)
 - make judgements about how well he was clothed and equipped
 - use specific evidence to support your assessment.



Forensic analysis of the Iceman

In the two and a half decades since the Iceman's remains were discovered, the body and the equipment found with it have undergone thorough forensic analysis. A wide range of specialists has analysed and interpreted hundreds of samples. All have contributed to the ongoing story of who the Iceman was and why he was on the mountain where he was found. Source 24 shows the results of these analyses over time.

- a** 2013: CT scans revealed the Iceman's teeth had several cavities, extensive wear of the tooth enamel and advanced **periodontitis** in the area of the rear molars.
- b** 2014: CT scans revealed a build-up of calcium in the Iceman's arteries consistent with **atherosclerosis**. Studies of the DNA revealed that he had a genetic predisposition for cardiovascular disease.
- c** 2011: The discovery of the Iceman's stomach enabled an analysis of its contents. He had eaten a sizable meal of uncleaned ibex meat (ash and animal hair were present), forest berries and einkorn grains (an ancient variety of wheat) less than two hours before death.
- d** 2016: The bacterium *Helicobacter pylori* was detected in the Iceman's stomach contents. This bacterium, found in about half the world's population, can cause gastritis and stomach ulcers. Scientists discovered that the Iceman had an unexpected strain of the bacterium, causing them to change their ideas about the history of settlements in Europe.
- e** 2003: **Histological and biochemical** evidence suggested that the Iceman received a cut to the base of his right thumb that reached down to the bone, consistent with a defensive wound that had not healed before death.
- f** 2015: New **multispectral imaging**, using ultraviolet, visible and infrared wavelengths, revealed previously unseen tattoos, many deep in the skin layers on his lower right ribcage. The Iceman has 61 tattoos, found on the lower back and legs, and arranged mostly in parallel lines, which are thought to be associated with medical treatment.
- g** 2007: CT scans revealed that the Iceman suffered a blow to the back of the head shortly before death. Scientists studying minute samples of brain tissue found traces of clotted brain cells, indicating bruising to the brain.
- h** 2012: An **endoscopy** found traces of a clotting protein called fibrin, which is only present in human blood for a very short time after a wound. Its presence indicates that the Iceman survived for a minimal time after sustaining a head wound.
- i** 2001: X-rays revealed a flint arrowhead near the shoulder, indicating the Iceman had been shot in the back with an arrow, which was subsequently pulled out.
- j** 2007: CT scans revealed that the arrowhead discovered in 2001 had penetrated the left **subclavian artery**, causing the Iceman to bleed to death within a short time.
- k** 1998: Examination of the Iceman's intestines revealed the presence of pollen from the hop hornbeam plant, which flowers between March and June, indicating that he died in spring.
- l** 2003: DNA analysis of the contents of both the ileum and colon (parts of the intestines) revealed that the Iceman had a breakfast of cereals, other plant food and ibex meat up to 30 hours before death.



SOURCE 24 The latest reconstruction of the Iceman showing the results of the scientific analyses of his remains

DNA analysis of the Iceman's remains

Perhaps the most exciting investigation of the Iceman to take place so far was the analysis of the DNA in 2012. A team of experts and scientists led by Albert Zink, from the EURAC Institute for Mummies and the Iceman in Bolzano, Italy, retrieved a minute sample of pelvic bone during a nine-hour autopsy of the remains. From a study of the nuclear DNA they were able to sequence the Iceman's entire **genome**. Of particular significance is the establishment of a genetic link between the Iceman and modern humans. The following are some of the findings that have been reported so far, which indicate that the Iceman:

- had brown hair and brown eyes
- was lactose intolerant – possibly most people were still unable to digest milk in his time when farming livestock was still a relatively recent development
- had blood group O and belonged to the **y-chromosomal haplogroup** G2a2b, which is rare in modern Europe – it shows that his ancestors probably migrated from the Middle East with the spread of agriculture
- has 19 living relatives from a region in Austria near where he was discovered, who share his rare mutation known as G-L9
- was more closely related to people living today in southern Europe than to those living in North Africa and the Middle East – he was closely related to modern people living in the geographically isolated islands of Sardinia and Corsica
- carried genetic mutations that gave him a high risk of coronary heart disease and atherosclerosis, or build-up of fat in his arteries
- had Lyme disease – evidence of a bacterium that causes the tick-borne disease was found in the DNA.

A study of the Iceman's **mitochondrial DNA** in 2006 by Dr Franco Rollo from the University of Camerino, Italy, found evidence suggesting that he was infertile. Since then speculation has occurred about the possible social impact of this condition. It has been suggested that his inability to father offspring might have caused him to be rejected by his peers.

Further research on the Iceman's mitochondrial DNA in 2016 resulted in the conclusion that his maternal genetic line, originating in the Alps, is now extinct due to migration of populations.

How did the Iceman die?

Despite having the latest information from the forensic analysis of the Iceman's remains, we can still only know the immediate cause of death. The circumstances leading to death remain a matter of speculation. Immediately following the discovery, Konrad Spindler theorised that he may have been overcome by a storm while crossing the Alps. Then, when X-rays and CT scans of the body revealed several broken ribs, Spindler suggested that a violent conflict had taken place shortly before the Iceman's death. He suggested that the Iceman's village had been attacked and that he had escaped. With his inadequate equipment (the incomplete arrows and partially made bow stave) and insufficient food, he had lain down to rest in a sheltered gully, died of hypothermia and was buried in the ice.

However, CT scans taken in 2007 revealed two important pieces of information that challenged this interpretation. First, an arrowhead detected in 2001 was found to have penetrated the left subclavian artery, causing huge blood loss as evidenced by the **haematoma**

■ **genome**
an organism's complete set of DNA, including all of its genes

■ **y-chromosomal haplogroup**
a genetic population group of people who share a common ancestor along the patrilineal (male) line

■ **mitochondrial DNA**
the small amount of genetic material or DNA found in mitochondria that is inherited through the maternal line

■ **haematoma**
an abnormal collection of blood outside the blood vessels that has leaked into surrounding tissue, caused by injury or disease

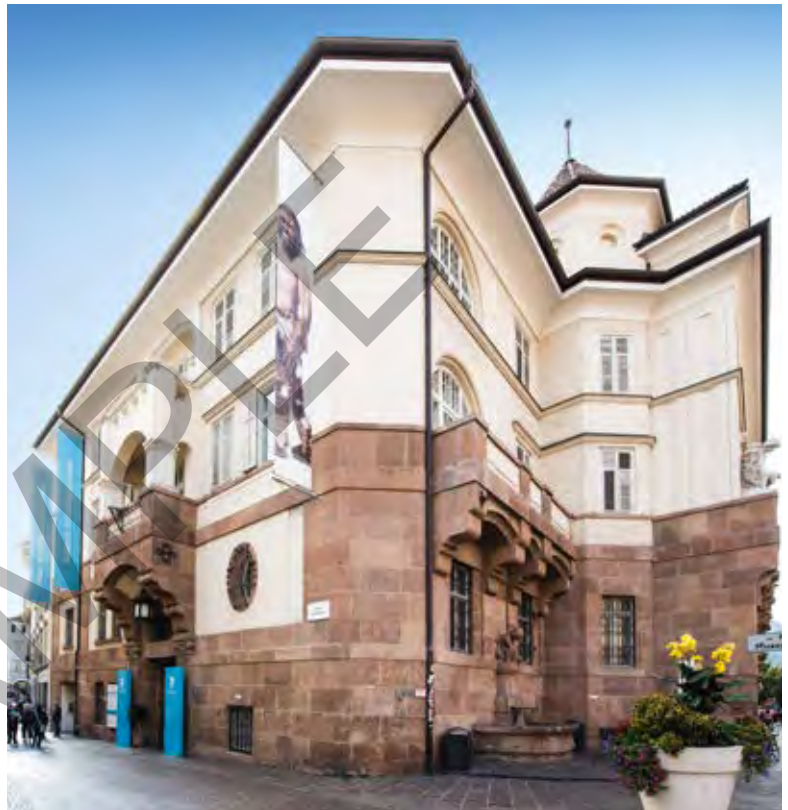
in the surrounding tissue. Second, the scans showed that the Iceman had suffered a brain trauma shortly before death. Whether this happened when he fell with the impact of the arrow or was the result of a blow from his assailant is unknown. Therefore, the Iceman bled to death after suffering an arrow wound and serious head injury.

So, the evidence indicates that the Iceman was murdered, presumably by one or more attackers who had pursued him up the mountain. The exact circumstances of his death might be revealed by further examination of his remains, but we may never know exactly what happened on that mountainside 5300 years ago or why it happened.

Further research on the Iceman

Research on the Iceman's remains is ongoing. The significant advances made in the last two decades will doubtless be added to in the future as the numerous teams studying samples taken from his body and equipment continue their work. The South Tyrol Museum of Archaeology, and EURAC's Institute for Mummies and the Iceman, both located in Bolzano, Italy, will play significant roles in this research. In Source 26, the South Tyrol Museum of Archaeology gives its view of the importance of the Iceman research.

SOURCE 25 *Ötzi the Iceman* is a three-floor permanent exhibition at the South Tyrol Museum of Archaeology. The museum features everything from his discovery and the international media response to research about his life in the Copper Age. You can even view Ötzi's mummy in his refrigerated cell.



SOURCE 26

Since his discovery in 1991, the Iceman has provided new data from prehistoric times for countless research disciplines around the globe, both in the natural sciences and in the humanities.

For example, using the Iceman as a starting point, it has been possible to conduct research into how specific organic artefacts and present-day diseases originated, to develop new diagnostic techniques and to gain information on climatic developments. The Iceman, or 'Ötzi', as he is nicknamed locally, has helped researchers in countless fields gain insights that would otherwise have been impossible to come by. In addition, the media, as well as a large section of the general public, are particularly interested in the man's fate, his personal history, how he lived and how he died. On this last point research, above all medical, paleopathological and forensic research, has contributed additional details and continues to do so. This has made the Iceman a unique example of how interdisciplinary research achieves positive results.

South Tyrol Museum of Archaeology, 'A look at the research work',
<www.iceman.it/en/the-research/>

6.3b Check your learning

- 1 Compare Konrad Spindler's theory with the information revealed by later scientific examination. What evidence was not available to Spindler at the time he drew his conclusions?
- 2 Consider the evidence already presented in this chapter as well as the information given below to develop your own theory to explain the Iceman's death.
 - Stone Age hunters aimed their arrows and spears at the left shoulder blade, knowing that this location offered the best chance of a kill. Was Iceman the victim of rivalry between hunters?



SOURCE 27

A close-up of one of the Iceman's tattoos on his right foot

- 3 Considering the Iceman's relatively young age at death, he had very bad dental health. Research the possible reasons for this.
- 4 Find out more about the Iceman's tattoos at the EURAC Research website. One is shown in Source 27.
- 5 Conduct more research on how the strain of the *Helicobacter pylori* bacterium present in the Iceman can change what we know about human settlement in Europe.
- 6 Find out more about the possible implications of the Iceman's infertility.
- 7 'It has been suggested that his inability to father offspring might have caused him to be rejected by his peers.' What questions need to be asked about such a suggestion? What kind of evidence would be needed to substantiate such an interpretation?
- 8 In 2014, the South Tyrol Museum of Archaeology engaged a criminologist to investigate the Iceman's murder. Read the results by searching online for 'Ötzi – a treacherous murder – with links to Central Italy'. Scroll down to 'Investigations of a "profiler"'.
 - 9 Visit the EURAC Research Iceman Photoscan project website to view some wonderful images of the Iceman.
 - 10 Use the information in this chapter and your own research to write a response to the following: 'Evaluate the significance of the scientific techniques used in the analysis of the Iceman for an understanding of his life and death.' (Evaluate: Make a judgement based on criteria; determine the value of.)

To help you plan your response:

 - identify some of the key scientific techniques used in the investigation of the Iceman
 - use these techniques to structure your answer
 - make judgements about the significance of what these techniques reveal about the Iceman
 - use specific evidence to support your evaluation.

Ethical issues and ancient human remains

Our consideration of the ethical issues related to the ownership, scientific analysis and display of human remains has been relatively recent. There is disagreement about the treatment and the ultimate fates of the bog people and the Iceman studied in this chapter. In some ways, these human remains are also seen as examples of cultural property, similar to the way in which excavated artefacts are seen as the cultural property of the regions or the countries in which they were found. For example, before Lindow Man's remains were transferred to the British Museum, there was an unsuccessful campaign to keep him in Manchester, closer to the location of Lindow Moss where he was found. However, Lindow Man has subsequently been on display in Manchester on three occasions, the most recent was in 2008–09 for a special exhibition called *Lindow Man: A Bog Body Mystery*.

The ownership of the Iceman's remains was also subject to dispute. After his recovery, he was taken to the University of Innsbruck for conservation and scientific examination in the belief that he had been found on the Austrian side of the border with Italy. A subsequent survey of the site found that he had actually been found a mere 92 metres from the border in South Tyrol, a province of Italy. In a victory for common sense, although the South Tyrolean authorities claimed property rights over the Iceman's remains, they agreed to leave him in Innsbruck until the scientific investigation was complete. The Iceman and his equipment were transported to Bolzano in Italy in 1998 to be housed in the newly built South Tyrol Museum of Archaeology.

Scientific analysis and display of ancient human remains

While ownership issues can often be solved amicably in the short term, issues relating to scientific analysis and display of ancient human remains have become more **contentious**. They can often continue for some time and ultimately remain unresolved.

Following are some of the contested issues:

- *preservation and display* – what sort of display?
- *reburial* – reburied where? With or without **rites**? If with rites, what sort?
- *research* – does the knowledge gained from human remains outweigh the value of preserving them undisturbed?
- *religion* – what are the views of Christians, Druids and other religious groups?
- *education* – how important is it to educate the public, particularly children, about the past?
- *tourism* – what are the benefits for tourism in the display of ancient human remains in regional and national museums?

Source 28 is the view of one **stakeholder**, Melanie Giles of Manchester University.

■ **contentious**
causing
disagreement

■ **rite**
a traditional or
religious ceremony

■ **stakeholder**
someone who has a
particular interest in
an issue, project or
organisation

SOURCE 28

... I believe it is important to study ancient human remains because this analysis and interpretation is transformative: it not only has the potential to challenge modern preconceptions but reveal very different understandings of what it meant to be human in the past.

... Ultimately, our goal is a greater understanding of the past or rather, human history, which we need to share and disseminate. What then, are our options? First, as I have argued, these remains cannot be easily re-interred, since the original context of their burial has usually been destroyed. I would be cautious about selecting an alternative place of burial and of imposing a rite or ritual upon them, which was not of their own choosing. But should they be displayed in a museum case? I believe this *can* be achieved with sufficient respect, perhaps by screening the body from any immediate visual access, and offering visitors a choice as to whether they actually view the remains. This is a deliberate policy adopted in the Archaeological Museum of the South Tyrol, with regard to the remains of the Ice Man. At this stage, the debate over display and reburial issues could be highlighted, through the views of different interest groups.

Melanie Giles, 'Bog bodies: representing the dead', paper delivered at the conference 'Respect for Ancient British Human Remains: Philosophy and Practice', Manchester Museum, 17 November 2006

6.4 Understanding and using the sources

- 1 What does Melanie Giles think is the value of studying ancient human remains?
- 2 From your study of this chapter, identify ways in which the original contexts of bog body burials have been destroyed.
- 3 Why would Giles be 'cautious' about reburial of ancient human remains? Do you think her caution is justified?
- 4 Who do you think are the different interest groups or stakeholders in the debate over display and reburial?
- 5 How could a museum give visitors a sense of the 'historical, social and landscape context' of any ancient human remains it had to display?
- 6 What is your opinion of Giles' suggestion of how ancient human remains could be displayed in a museum?

Replicas and reproductions

One way of getting around the problem of displaying actual human remains is the use of replicas and reproductions. For example, a company in the UK prepares replicas of the royal Egyptian mummies for display. These are constructed by a special process using real bones and artificial organic flesh to produce perfect **facsimiles**. The manufacturers claim that exhibiting these replicas enables the public to view the mummies while preserving the originals. It also enables the display of human remains in cultures that do not choose to display real bodies.

A recent technological innovation has enabled the production of replicas using 3D printing. A 3D-printed replica of Tutankhamun's mummy was displayed in a New York exhibition in 2014. In 2016, the South Tyrol Museum of Archaeology presented a life-size replica of the Iceman's body. The 3D sculptures were both made by American **paleoartist** Gary Staab. Three replicas of the Iceman's mummy have been made to be used for a travelling exhibition in the United States and Canada, and for teaching purposes.

■ **facsimile**
exact copy

■ **paleoartist**
an artist specialising
in artworks relating
to paleolithic times

6.4a Check your learning

- 1 Research the ways in which some of the bog bodies in this chapter have been preserved and displayed. Do you approve of the decisions made by the researchers and museums? (Hint: Compare pictures of Grauballe Man immediately after its discovery and the picture of it on display seen in Source 5.)
- 2 Consider what has been discovered about the Iceman's remains in the last two decades. In what ways has the research carried out been of benefit to us?
- 3 Research the views of Christians, Druids and other religious groups about what should be done with ancient human remains.
- 4 Read all of Melanie Giles' paper, *Bog Bodies: Representing the Dead*, online.
- 5 Find out what the ICOM Code of Ethics for Museums has to say about the acquisition and display of human remains. Search online for 'ICOM Code of Ethics', open the PDF document and scroll down to '2.5 Culturally Sensitive Material'.
- 6 For a discussion of the different **perspectives** associated with the ethics of mummy research, search online for 'Ethics of mummy research – Decoding the Heavens'.
- 7 View exciting YouTube clips of the process used to create the replicas of Tutankhamun and the Iceman by searching online for '3D replica Tutankhamun' and 'Presentation of an Ötzi mummy replica by paleoartist Gary Staab'.



SOURCE 29 A 3D replica of the Iceman's mummy

■ **perspectives**
the points of view held by individuals or groups about the past that are based on their contexts and motivations

Australian Aboriginal peoples and ethical issues

In post-colonial times, largely since World War II, many new nations that were formerly colonies have been demanding the return of their cultural property, including the remains of their ancestors. Such demands have met with mixed success. An Australian example concerns the treatment of Australian Aboriginal skeletal remains. During the 19th and most of the 20th centuries, excavation of Aboriginal sites and research into Aboriginal culture was conducted mostly by European Australians. Little consideration was given to Aboriginal attitudes to such excavation, or to the analysis and display of skeletal material in museums. Sacred sites were dug up, burial sites looted and anything of interest was taken away to be examined or displayed in museums.

The head of Pemulwuy, a warrior of the Sydney Eora tribe, was cut off, pickled, bottled and sent to England for display. A great number of other Aboriginal remains suffered the same fate. Truganini, a traditional Tasmanian Aboriginal, feared what would happen to her remains, and her fears were realised. Two years after her death, the government gave permission to the

■ **repatriation**
the return of
someone to their
own country

Tasmanian Royal Society to exhume her bones on the condition that her remains be properly stored and accessible for scientific purposes. However, her body was later put on public display for almost 50 years before being removed from display in 1951.

In more recent times, Aboriginal claims to museums, such as the British Museum in London and the Ashmolean Museum in Oxford, have resulted in the return of both cultural artefacts and skeletal material to their original owners, as shown in Source 32. This was made possible by the British Government's *Human Tissue Act 2004*, which allows museums to return remains that 'are reasonably believed to be under 1000 years in age'.

In Australia, Section 21 of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* provides for the return of Aboriginal human remains 'to an Aboriginal or Aboriginals entitled to, and willing to accept possession, custody or control of the remains in accordance with Aboriginal tradition'.

Today, although there are no Aboriginal skeletons on display in Australian museums, it is estimated that 10 000 Indigenous remains are still held in Australian museums. Many collections of such material held by both Australian and international universities and museums are being returned to Aboriginal communities for reburial. Source 30 records some of the earliest examples of **repatriation** of Aboriginal remains. In 2007 the *United Nations Declaration on the Rights of Indigenous Peoples* formally included specific recognition of the right to repatriation of their human remains (see Source 31).

SOURCE 30 Extract from 'Remains Repatriation Timeline'

1976	The Tasmanian Museum and Art Gallery, Hobart, Tasmania, becomes the first museum in Australia to return Aboriginal remains, with the return of the remains of Truganini to the Tasmanian Aboriginal community. The Royal Society of Tasmania had exhumed her body two years after her death in 1876 and put her skeleton on public display for 40 years.
1985	May: Tasmanian Museum and Art Gallery, Hobart, Tasmania, returns the Tasmanian Aboriginal human remains commonly known as the Crowther Collection (33 skulls and three skeletons) for cremation at Oyster Cove. The 'largest gathering of Tasmanian Aboriginal people in a decade' attends the cremation.
1990	February: Royal College of Surgeons, Dublin, Ireland, gives back the head of the great-great grandfather of Tasmanian lawyer Michael Mansell after he went to Dublin petitioning for the return of Aboriginal remains including the one of his family.
2000	The Royal College of Surgeons of Edinburgh, UK, returns 500 remains.
2003	The Edinburgh Museum, Scotland, returns remains that were dug up from burial grounds in South Australia. April: Royal College of Surgeons, Dublin, hands over 60 Aboriginal human remains to Aboriginal representatives, who had travelled to Ireland to collect the remains and return them to Australia. 10 September: The Museum of Victoria returns the remains of an Aboriginal baby girl nicknamed 'Jaara Baby' to her modern-day relatives, the Dja Dja Wurrung people of north-west Victoria, 99 years to the day after they were found in a tree by a woodcutter.

<http://www.creativespirits.info/aboriginalculture/people/aboriginal-remains-repatriation>

SOURCE 31

- 1 Indigenous peoples have the right to manifest, practice, develop and teach their spiritual and religious traditions, customs and ceremonies; the right to maintain, protect, and have access in privacy to their religious and cultural sites; the right to the use and control of their ceremonial objects; and the right to the repatriation of their human remains.
- 2 States shall seek to enable the access and/or repatriation of ceremonial objects and human remains in their possession through fair, transparent and effective mechanisms developed in conjunction with indigenous peoples concerned.

United Nations, 'Article 12', *United Nations Declaration on the Rights of Indigenous Peoples*, Australia: Australian Human Rights Commission



SOURCE 32 The remains of two Bundjalung people from northern NSW are buried following their return from Leiden University in the Netherlands in 2010.

6.4b Check your learning

- 1 In what way does the issue of the return of skeletal remains to Aboriginal communities reflect political and racial views?
- 2 What are the arguments for and against the return of Aboriginal human remains?
- 3 What rights are acknowledged in the other Articles of the United Nations Declaration?
- 4 Hold a class debate on the topic: 'The potential value of research on ancient human remains to science and medicine is more important than the consideration of ethical concerns.'
Your arguments could be informed by the research and discussion you have carried out.
- 5 Use the knowledge you have gained in this chapter to write a response to the following: 'Explain the ethical issues involved in the ownership, treatment and display of human remains.' (Explain: Relate cause and effect, make the relationships between things evident, provide why and/or how.)
To help you plan your response:
 - identify some ethical issues involved in the ownership, treatment and display of human remains
 - use these issues to structure your response
 - use specific evidence to develop your explanation of issues
 - write a conclusion that sums up the key ethical issues.

In this chapter we have examined some fascinating examples of ancient human remains, in particular bog bodies and the Iceman. By looking at the scientific examinations of the remains of these ancient humans we have seen how they died and have tried to work out why they died as they did. We have seen how, to some extent, it is possible to reconstruct their life and times by drawing conclusions from their remains and the possessions found with them. In the 25 years since the Iceman's discovery, there has been an explosion of information discovered by the application of recent developments in technology and genomic identification. Further scientific developments will no doubt reveal even more about both bog bodies and the Iceman.

It is clear, however, that despite all the scientific advances, we cannot escape considering the ethics involved in the study, ownership and display of ancient human remains. At the point of discovery, whether it is in a bog, a glacier or any of the other places ancient human remains are found, we have to decide what is the right and proper thing to do with the discovery. At no time can we forget that the remains were once human beings. In some cases, for example in dealing with the remains of Aboriginal people, we must be sensitive to the cultural links between contemporary peoples and the remains of their ancestors.



FOR THE TEACHER

Check your [obook](#) [assess](#) for the following additional resources for this chapter:

Answers

Answers to each *Check your learning*, *Understanding and using the sources* and *Profile task* in this chapter

Teacher notes

Useful notes and advice for teaching this chapter, including syllabus connections and relevant weblinks

Class test

Comprehensive test to review students' skills and knowledge

assess quiz

Interactive auto-correcting multiple-choice quiz to test student comprehension



TUTANKHAMUN WEARING THE BLUE CROWN

The Metropolitan Museum of Art, New York, USA

This statue head (circa 1336–1327 BC) is of the young Egyptian king Tutankhamun. Made of limestone, it is a fragment from a group of statues that depicted the god Amun seated on a throne, with the young king standing or kneeling in front of him. The king's figure was significantly smaller than that of the god, indicating his subordinate status in the presence of the deity. All that remains

of Amun is his right hand, which touches the back of the king's crown in a gesture that signifies Tutankhamun's inauguration as king. During coronation rituals, various types of crowns were placed on the king's head. The type of crown present here – probably a leather helmet with metal discs sewn onto it – was generally painted blue and is commonly called the 'blue crown'.

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