



# Archaeology of Death

## 13 Mummies, preservation of soft tissue; Body decoration & face reconstruction

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c \_ t \_ \_ s \_ \_ \_ \_





Tollund Man, 400 BC

IRA BLOCK, COURTESY SILKEBORG MUSEUM, DENMARK



# Natural conditions for body preservation

## Preservation in dry environment

**Chinchorro Culture, Paracas Cemetery; Atacama Desert,** (Peru & Chile) natural & reconstructed mummies, since 7th Millenium B.C.

**Predynastic Egypt & Nagada Culture** 4th Millenium B.C.

**Thulla necropolis** (Yemen – Noman mountains) 4th Century B.C.

**Tarim basin** (Xinjiang Uyghur Autonomous Region, China) Site Urumchi 1800–900 B.C.

**The Capuchin Catacombs** of Palermo (Sicily, Italy) since the end of 16th Century A.D.

## Preservation in peat wetland

**Bog bodies** (Denmark), Grauballe Man & Tollund Man, 3rd Century B.C. – 3rd Century A.D.

**Lindow man** (England, Cheshire) 1st Century B.C.

**Elite burials from Bronze Age Barrows** in Jutland (Denmark), Girl of Ektved 13th Century B.C.

## Preservation by freezing

**Ötzi the Iceman**, Ötztal (Italy), Hauslabjoch pass,, 3200 meters a.s.l., Remedello Culture 3300 B.C.

**Pazyryk Culture**: Kurgan burials in the Altai, 5th – 3rd Century B.C.

**Qilakitsoq** (Greenland) 8 bodies buried in ice, 1425-1525 A.D.

**Frozen human sacrifices in Andes** (Peru & Chile), e.g. Ampato girl, Incas Empire 1450 – 1532 A.D.

## Preservation in salt

**Hallstatt salt mines** (Austria), Early Iron Age 7th–6th Century B.C. reported preserved bodies of miners.

**Chehrabad Salt man** (Iran), 3rd Century A.D.

## Cavity preservation in volcanic dust

**Pompei & Herculaneum** (Italy) bodies preserved as burned negatives in the volcanic dust after Vesuvio eruption on 24th August 79 A.D.





Natural mummy  
Atacama Desert

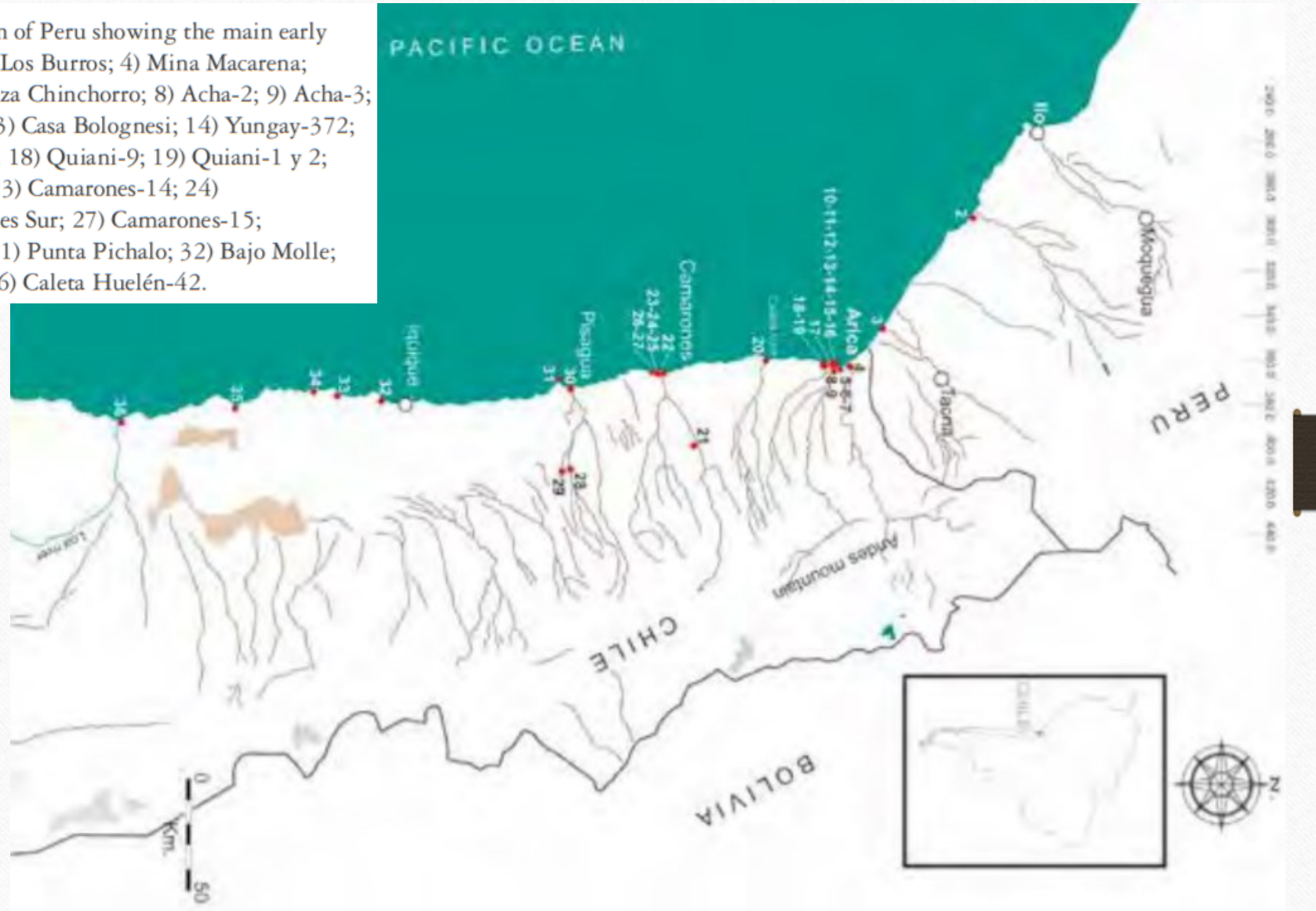
## Chinchorro mummies – Peru & Chile

The Chinchorro mummies are mummified remains of individuals from the South American Chinchorro culture, found in what is now northern Chile. They are the oldest examples of artificially mummified human remains, having been buried up to two thousand years before the Egyptian mummies. Although the earliest mummy that has been found in Egypt dated around 3000 BC, the oldest anthropogenically modified Chinchorro mummy dates from around 5050 BC.

The oldest naturally mummified corpse recovered from the Atacama Desert is dated around **7020 BC**. 29% of known Chinchorro mummies were mummified naturally. The earliest one, the Acha man, dates to 7020 BC. The artificial mummies of Chinchorro are believed to have first appeared around 5000 BC and reached a peak around 3000 BC. Often Chinchorro mummies were elaborately prepared by removing the internal organs and replacing them with vegetable fibers or animal hair. In some cases an embalmer would remove the skin and flesh from the dead body and replace them with clay. Radiocarbon dating reveals that the oldest discovered anthropogenically modified Chinchorro mummy was that of a child from a site in the Camarones Valley, about 97 km south of Arica in Chile and dates from around 5050 BC. The mummies continued to be made until about 1800 BC, making them contemporary with Las Vegas culture and Valdivia culture in Ecuador and the Norte Chico civilization in Peru.



*Figure 1.* Map of northern of Chile and southern of Peru showing the main early archaeological sites: 1) Jaguay; 2) Tacahuay; 3) Los Burros; 4) Mina Macarena; 5) Chinchorro-1; 6) Maderas Enco; 7) Maestranza Chinchorro; 8) Acha-2; 9) Acha-3; 10) Morro-1; 11) Morro-1/6; 12) Morro-1/5; 13) Casa Bolognesi; 14) Yungay-372; 15) Colón-1; 16) Colón-10; 17) Playa Miller-8; 18) Quiani-9; 19) Quiani-1 y 2; 20) Vítor; 21) Conanoxa; 22) Camarones PN; 23) Camarones-14; 24) Camarones-17; 25) Camarones-8; 26) Camarones Sur; 27) Camarones-15; 28) Tiliviche; 29) Aragón; 30) Pisagua Viejo; 31) Punta Pichalo; 32) Bajo Molle; 33) Chucumata; 34) Caramucho; 35) Patillo; 36) Caleta Huelén-42.





While the overall manner in which the Chinchorro mummified their dead changed over the years, several traits remained constant throughout their history. In excavated mummies, archaeologists found skin and all soft tissues and organs, including the brain, removed from the corpse. After the soft tissues had been removed, sticks reinforced bones while the skin was stuffed with vegetable matter before reassembling the corpse. The mummy received a clay mask even if the mummy was already completely covered in dried clay; a process which the body was wrapped in reeds left to dry out for 30 to 40 days.

The types of mummification can be divided into three categories: simple treatment, complex treatment, and mud-coated mummies. He believed that these occurred chronologically, the mummification process becoming more complex as time went on. Since then, archaeologists have expanded upon this explanation and have agreed upon the following types of mummification: natural, black, red, mud-coated and bandage mummies. Mummification can also be described as externally prepared mummies, internally prepared mummies (Egyptian technique), and reconstructed mummies (the Chinchorro). Further, it turns out that the types of mummification used overlap with each other, and mummies of different types have been found all in the same tomb. The two most common techniques used in Chinchorro mummification were the Black mummies and the Red mummies.







**The black mummy technique (5000 to 3000 BC)** involved taking the dead person's body apart, treating it, and reassembling it. The head, arms, and legs were removed from the trunk; the skin was often removed, too. The body was heat-dried, and the flesh and tissue were completely stripped from the bone by using stone tools. Evidence exists that the bones were dried by hot ashes or coal. After reassembly, the body was then covered with a white ash paste, filling the gaps with grass, ashes, soil, animal hair and more. The paste was also used to fill out the person's normal facial features. The person's skin (including facial skin with a wig attachment of short black human hair) was refitted on the body, sometimes in smaller pieces, sometimes in one almost-whole piece. Sea lion skin was sometimes used as well. Then the skin (or, in the case of children, who were often missing their skin layer, the white ash layer) was painted with black manganese giving their colour.

**The red mummy technique (2500 BC to 2000 BC)** was a technique in which rather than disassemble the body, many incisions were made in the trunk and shoulders to remove internal organs and dry the body cavity. The head was cut from the body so that the brain could be removed, after which the skin would be pasted back on, which would often just be covered with a clay mask. The body was packed with various materials to return it to somewhat more-normal dimensions, sticks used to strengthen it, and the incisions sewn up using reed cord. The head was placed back on the body, this time with a wig made from tassels of human hair up to 60 cm long. A "hat" made out of black clay held the wig in place. Except for the wig and often the (black) face, everything was then painted with red ochre.







## Mud coat

The final style of Chinchorro mummification was the mud-coat (3000-1300 BC). Ecologically speaking, at the time of the Chinchorro culture the region was relatively stable. It has been suggested by environmentalists that the incredible preservation of these mummies is also influenced by the pedogenic (the evolution of soil) creation of clays and gypsum, which act as cementing agents, and the latter as a natural desiccant. The malleable clay allowed for the morticians to mould and create the colourful appearances of mummies, with the added bonus of the fact that the foul smell of the desiccating mummy would be covered. Artisans no longer removed the organs of the dead; instead a thick coat of mud, sand and a binder like egg or fish glue was used to cover the bodies. Once completed the mummies were cemented into their graves. The change in style may have come from exposure to outsiders and their different cultures, or from the association of disease with the rotting corpses.

## Bandage technique

The bandage technique (guessed to be 2620-2000 BC, but there is a lack of radiocarbon dating) has only been found to be present in three infants. The technique is a mixture of black and red mummies, in that the body was taken apart and reinforced in the style of black mummies but the head was treated in the same way as red mummies are. Animal and human skin were used to wrap the body in the place of clay. Further, the bodies were found to be painted with red ochre while the heads were painted with black manganese.





Wooden carved anthropomorphic figurines resembling the mummified ancestors



# Nagada Culture 3400 BC Upper Egypt: Gebelein



British Museum, London inv.no. 1900,1018.1



# Yemen – Noman mountains

## Thulla necropolis 4th Century BC.



Sanná  
University  
Museum  
2009



















# Urumchi mummies 1800–900 B.C.

## Tarim basin (Xinjiang Uyghur Autonomous Region, China)



The Tarim mummies are a series of mummies discovered in the Tarim Basin in present-day Xinjiang, China, which date from 1800 BC to the first centuries BC. The mummies, particularly the early ones, are frequently associated with the presence of the Indo-European Tocharian languages in the Tarim Basin, although the evidence is not totally conclusive and many centuries separate these mummies from the first attestation of the Tocharian languages in writing. Victor H. Mair's team concluded that the mummies are Caucasoid, likely speakers of Indo-European languages such as the Tocharians.













By Chunxiang Li, Chao Ning, Erika Hagelberg, Hongjie Li, Yongbin Zhao, Wenying Li, Idelisi Abuduresule, Hong Zhu and Hui Zhou - <http://www.biomedcentral.com/1471-2156/16/78>, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=41708459>



## The Beauty of Loulan

The most famous of the Tarim mummies, along with the Cherchen Man. She was discovered in 1980 by Chinese archaeologists working on a film about the Silk Road. The mummy was discovered near Lop Nur. She was buried 3 feet beneath the ground. The mummy was extremely well preserved because of the dry climate and the preservative properties of salt. She was wrapped in a woolen cloth; the cloth was made of two separate pieces and was not large enough to cover her entire body, thereby leaving her ankles exposed. The Beauty of Loulan was surrounded by funerary gifts. The Beauty of Loulan has been dated back to approximately 1800 BCE. She reached the age of 45, when she died. Her cause of death is likely due to lung failure from ingesting large amount of sand, charcoal, and dust. According to Elizabeth Barber, she probably died in the winter because of her provisions against the cold. The rough shape of her clothes and the lice in her hair suggest she lived a difficult life. Her hair colour has been described as auburn. Her hair was infested with lice. At the time of funeral she was wearing clothing made of wool and fur. Her hood is made of felt and has a feather in it. She is wearing rough ankle-high moccasins made of leather, with fur on the outside. Her skirt is made of leather, with fur on the inside for warmth. She is also wearing a woollen cap. According to Elizabeth Barber, these provisions against the cold suggest she died during the winter. She possesses a comb, with four teeth remaining. Barber suggests that this comb was a dual purpose tool to comb hair and to "pack the weft in tightly during weaving" and a "neatly woven bag or soft basket." Grains of wheat were discovered inside the bag.





## The Capuchin Catacombs Palermo since 1599

The bodies were dehydrated on the racks of ceramic pipes in the catacombs and sometimes later washed with vinegar. Some of the bodies were embalmed and others enclosed in sealed glass cabinets. Monks were preserved with their everyday clothing and sometimes with ropes they had worn as a penance. The catacombs contain about 8000 corpses & 1252 mummies that line the walls. The halls are divided into categories: Men, Women, Virgins, Children, Priests, Monks, and Professionals. Some bodies are better preserved than others. Some are set in poses; for example, two children are sitting together in a rocking chair.



Rosalia Lombardo † 6 December 1920

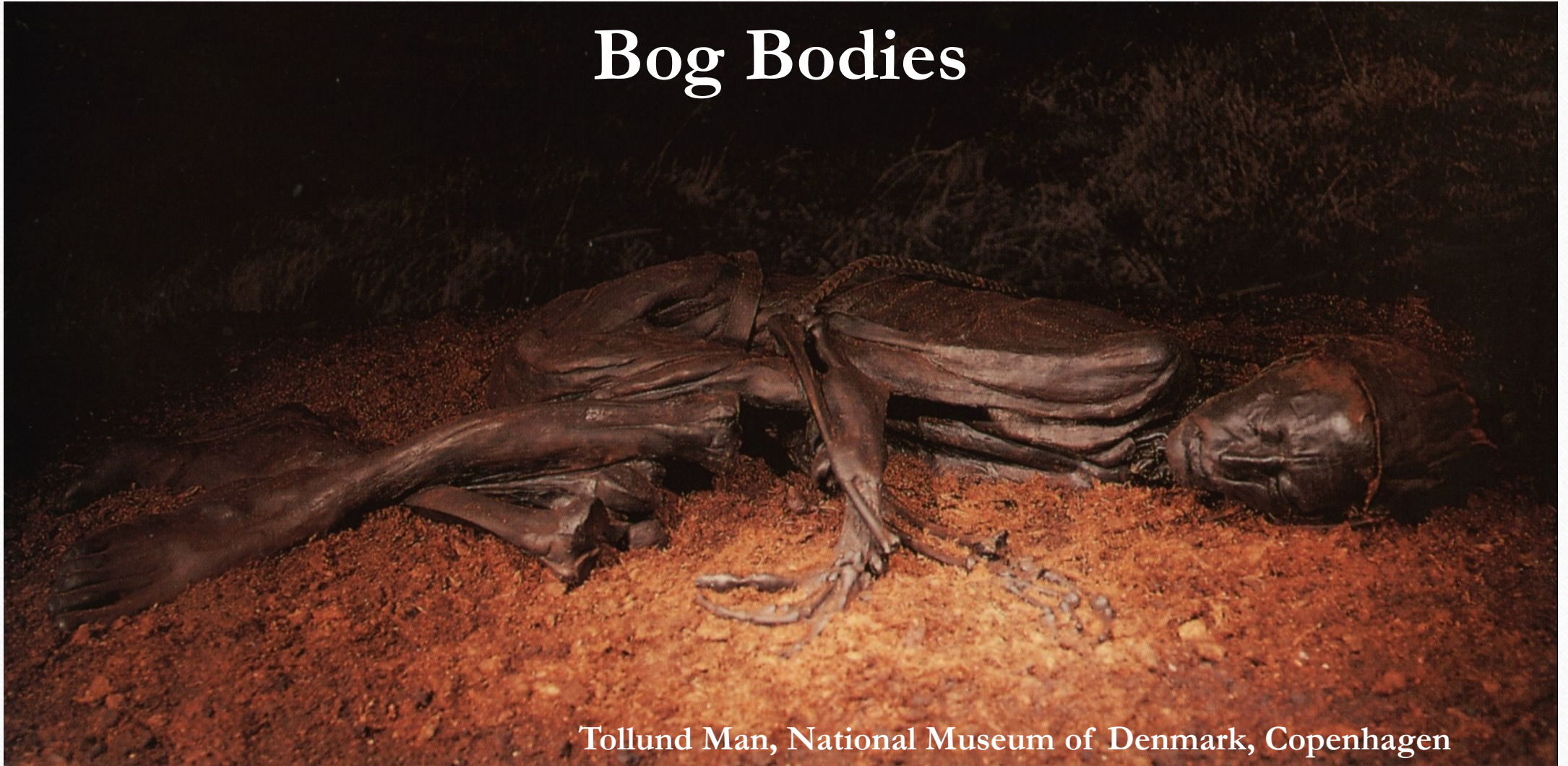




Chinese's Buddha statue (currently in Netherlands) contains the remains of a mummified monk (Buddhist master, Liuquan). The statue dates from c. 1050-1150 A.D.



# Bog Bodies



Tollund Man, National Museum of Denmark, Copenhagen



A bog body is a human cadaver that has been naturally mummified in a peat bog. Such bodies, sometimes known as bog people, are both geographically and chronologically widespread, having been dated to between 8000 BC and the World War II. The unifying factor of the bog bodies is that they have been found in peat and are partially preserved; however, the actual levels of preservation vary widely from perfectly preserved to mere skeletons. The oldest fleshed bog body is that of Cashel Man, who dates to 2000 BCE during the Bronze Age. The overwhelming majority of bog bodies – including examples such as Tollund Man, Grauballe Man and Lindow Man – date to the Iron Age and have been found in northwest European lands, particularly Denmark, Germany, the Netherlands, the UK and Ireland. Such Iron Age bog bodies typically illustrate a number of similarities, such as violent deaths and a lack of clothing, which has led archaeologists to believe that they were killed and deposited in the bogs as a part of a widespread cultural tradition of human sacrifice







Croghan Man, National Museum of Ireland, Dublin.



# Body Preservation – Bog Chemistry

The preservation of bog bodies in peat bogs is a natural phenomenon, and not the result of human mummification processes. It is caused by the unique physical and biochemical composition of the bogs. Different types of bogs can affect the mummification process differently: raised bogs best preserve the corpses, whereas fens and transitional bogs tend to preserve harder tissues such as the skeleton rather than the soft tissue.

A limited number of bogs have the correct conditions for preservation of mammalian tissue. Most of these are located in colder climates near bodies of salt water. For example, in the area of Denmark where the Haraldskær Woman was recovered, salt air from the North Sea blows across the Jutland wetlands and provides an ideal environment for the growth of peat. As new peat replaces the old peat, the older material underneath rots and releases humic acid, also known as bog acid. The bog acids, with pH levels similar to vinegar, conserve the human bodies in the same way as fruit is preserved by pickling. In addition, peat bogs form in areas lacking drainage and hence are characterized by almost completely anaerobic conditions. This environment, highly acidic and devoid of oxygen, denies the prevalent subsurface aerobic organisms any opportunity to initiate decomposition. Researchers discovered that conservation also required that they place the body in the bog during the winter or early spring when the water temperature is cold—i.e., less than 4 °C. This allows bog acids to saturate the tissues before decay can begin. Bacteria are unable to grow rapidly enough for decomposition at temperatures under 4 °C.

The bog chemical environment involves a completely saturated acidic environment, where considerable concentrations of organic acids and aldehydes are present. Layers of sphagnum and peat assist in preserving the cadavers by enveloping the tissue in a cold immobilizing matrix, impeding water circulation and any oxygenation. An additional feature of anaerobic preservation by acidic bogs is the ability to conserve hair, clothing and leather items. Modern experimenters have been able to mimic bog conditions in the laboratory and successfully demonstrate the preservation process, albeit over shorter time frames than the 2,500 years that Haraldskær Woman's body has survived. Most of the bog bodies discovered showed some aspects of decay or else were not properly conserved. When such specimens are exposed to the normal atmosphere, they may begin to decompose rapidly.





Grauballe Man, National Museum of Denmark, Copenhagen



# Famouse Bog Bodies of NW Europe

**Bocksten Man**, a modern body from 1290 to 1430 C, found in 1936 in Varberg, Sweden.

**Borremose Bodies**, from 400–700 BC, found in the 1940s in Himmerland, Denmark.

**Cashel Man**, from 2000 BC, discovered in 2011 in County Laois, Ireland. It is the oldest fleshed bog body in the world.

**Cladh Hallan mummies**, from 1600 to 1300 BC, found on the island of South Uist, Scotland.

**Clonycavan Man**, from 392–201 BC, found in 2003 in County Meath, Ireland

**Girl of the Uchter Moor**, from between 764 and 515 BC, found in 2000 in Uchte, Germany.

**Grauballe Man**, from 290 BC, found in 1952 in Jutland, Denmark.

**Haraldskær Woman**, from 490 BC, found in 1835 in Jutland, Denmark.

**Lindow Man**, from 2 BC–119 AD, found in 1984 in Cheshire, England.

**Old Croghan Man**, from 362–175 BC, found in 2003 County Offaly, Ireland.

**Tollund Man**, from 400 BC, found in 1950 in Jutland, Denmark.

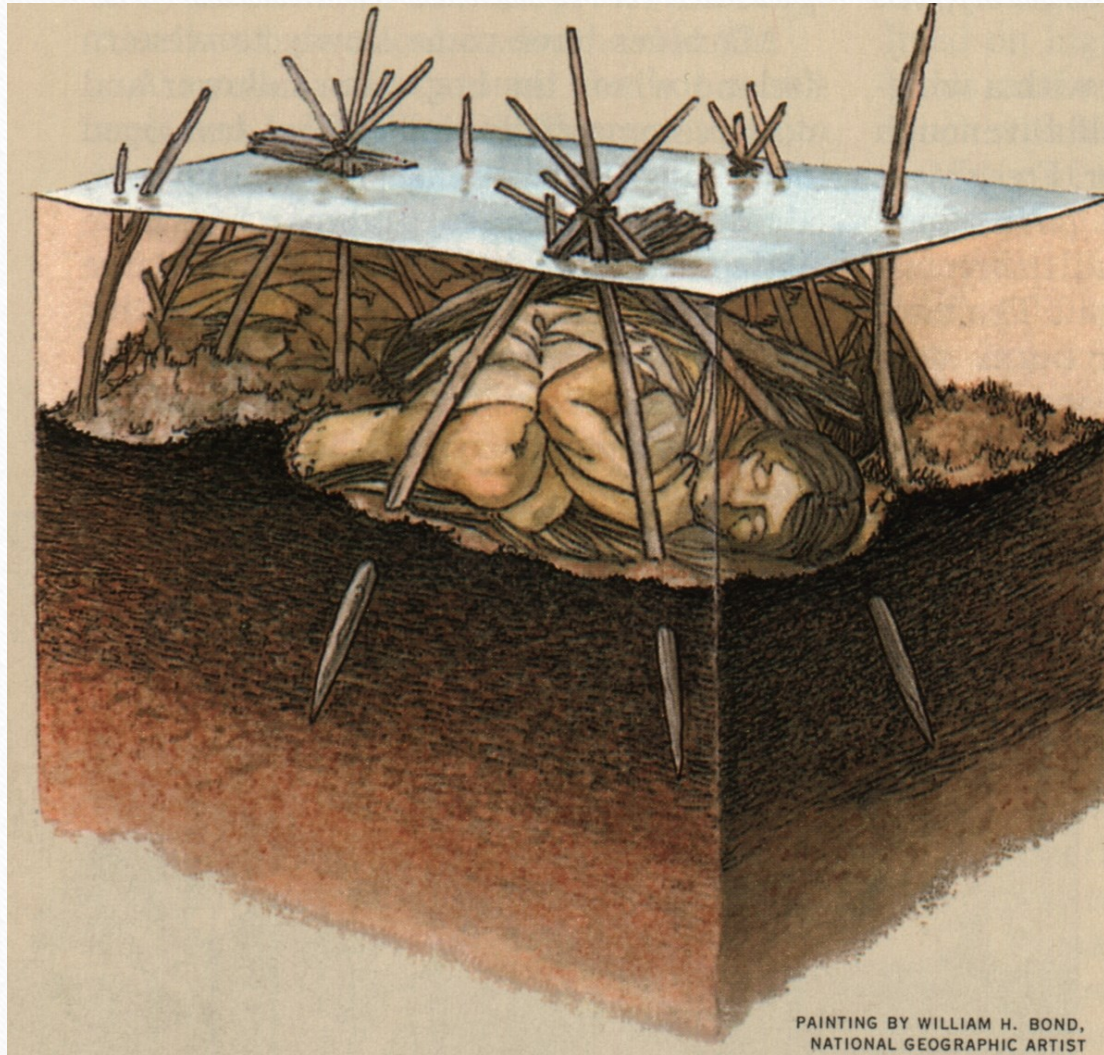
**Weerdinge Men**, from 160–220 BC, found in 1904 in Drenthe, Netherlands.

**Windeby I**, from 41 BC and 118 AD, found in 1952 in Schleswig-Holstein, Germany.

**Yde Girl**, 170 BCE–230 AD, found in 1897 near Yde, Netherlands.



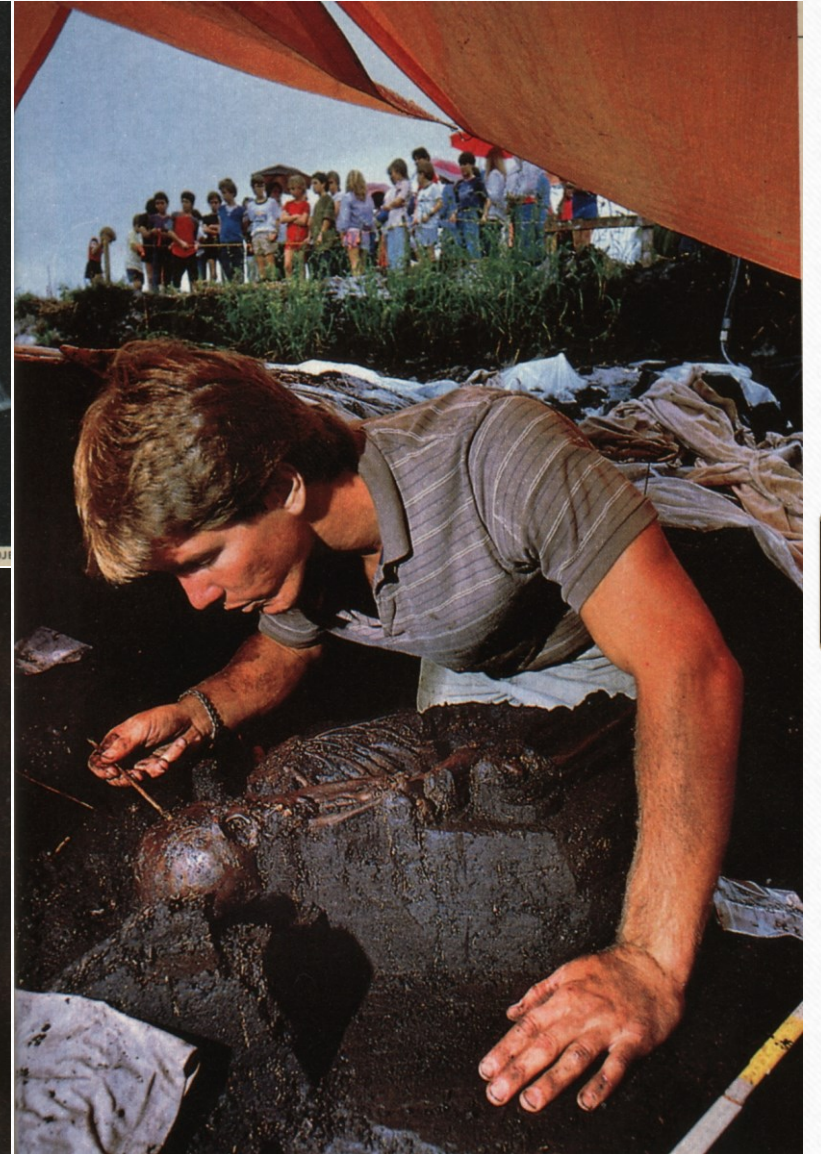
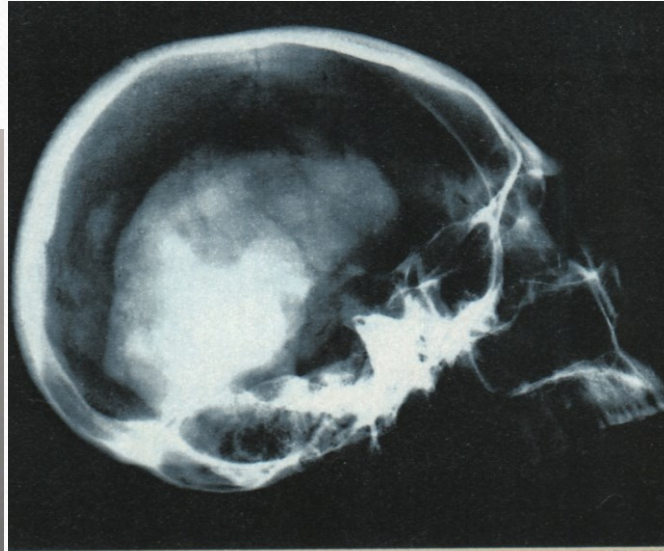
## Human Sacrifices in marchland







**Denmark: Osterby Man**  
with hair tied in a Suebian knot







The body of Iron Age teenage boy, found at Windeby in Schleswig, Germany; Photo by Bullenwächter



# Lindow Man Cheshire

At the time of death, Lindow Man was a healthy male in his mid-20s, and he may have been someone of high status, as his body shows little evidence of heavy or rough work. There has been debate over the reason for Lindow Man's death, because the nature of his demise was violent and perhaps ritualistic. After a last meal of charred bread, Lindow Man was strangled, hit on the head, and his throat cut.[1] Dating the body has proven problematic, but it is thought that Lindow Man was deposited into Lindow Moss, face down, some time between 2 BC and 119 AD, in either the Iron Age or Romano-British period. The recovered body has been preserved by freeze-drying and is on permanent display at the British Museum





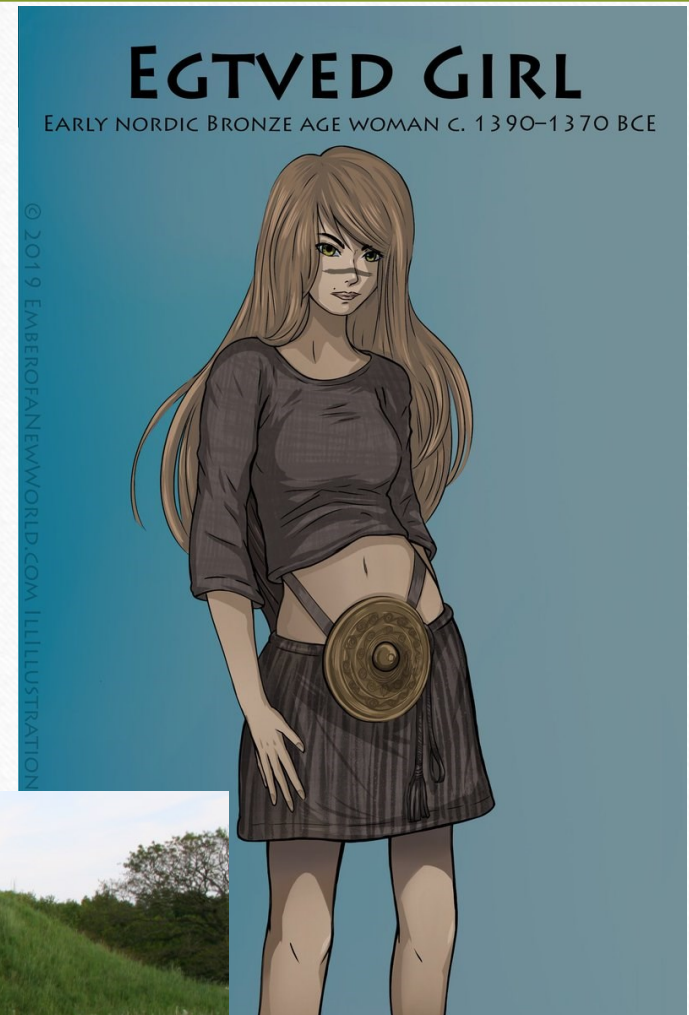
## Bronze Age girl from Ektved, Denmark 1390–1370BC

The Egtved Girl was buried in a coffin—the carefully hollowed-out trunk of a large oak tree. She was covered with a woolen blanket and placed on a cowhide sheet. A yarrow flower was placed on the coffin at the time of her burial—revealing that the Egtved Girl was buried in summer. An analysis of the coffin using dendrochronology (the study of tree rings) was used to date the remains. Only the girl's hair, brain, teeth, nails, and skin were preserved. The cremated remains of a 5- or 6-year-old child were also buried with Egtved Girl. Given Egtved Girl's age, the child was almost certainly not her's.



Photograph by Roberto Fortuna, with kind permission of the National Museum of Denmark





Watch the video: <https://www.youtube.com/watch?v=Vnr3iaj0Pq8&list=PLnu7oykoatOmYBxHAXYeenpytuwcZYN5X&index=21>



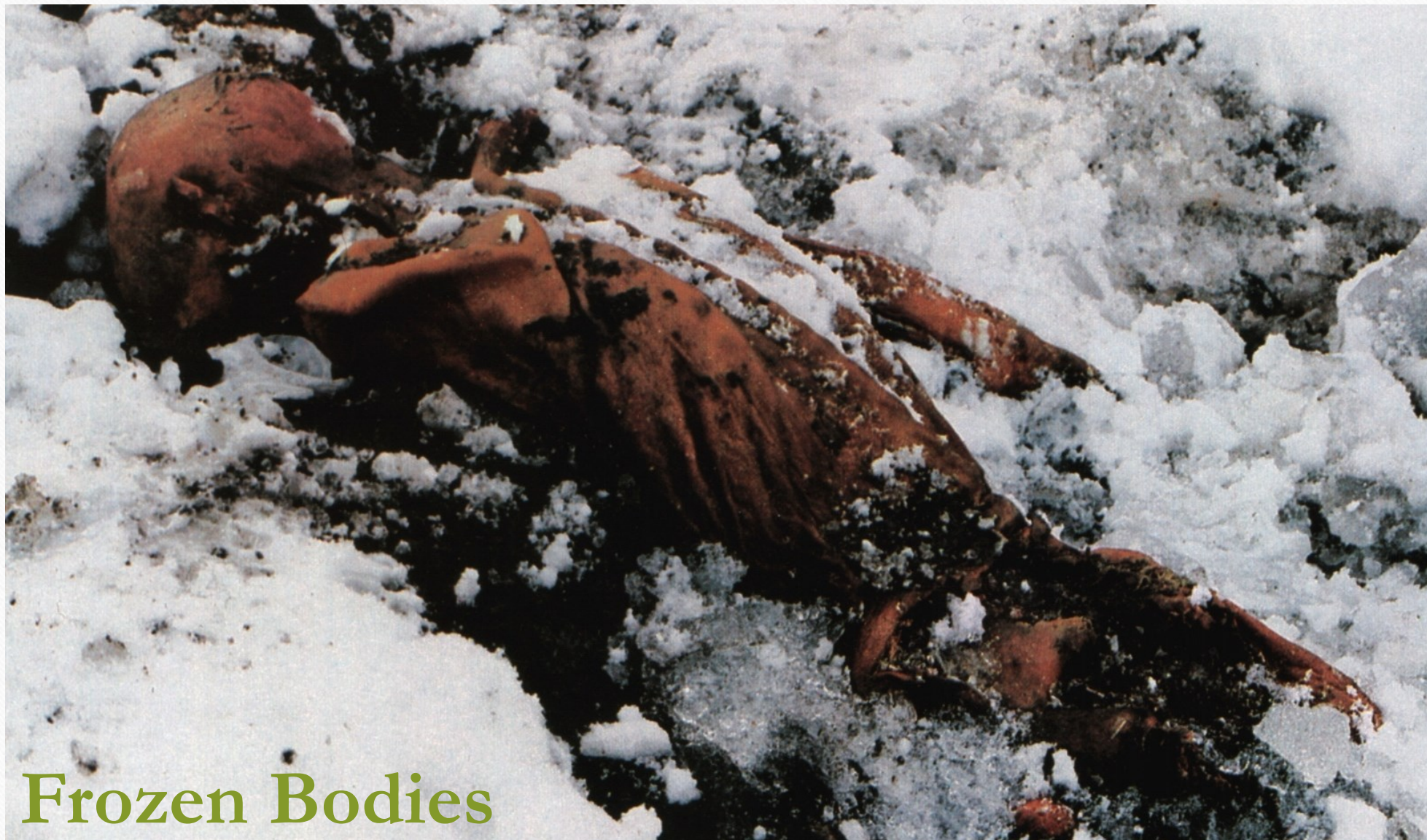
**Karin Margarita Frei, Ulla Mannering, Kristian Kristiansen, Morten E. Allentoft, Andrew S. Wilson, Irene Skals, Silvana Tridico, Marie Louise Nosch, Eske Willerslev, Leon Clarke & Robert Frei 2015:**

**Tracing the dynamic life story of a Bronze Age Female.** *Scientific Reports* volume 5, Article number: 10431

Ancient human mobility at the individual level is conventionally studied by the diverse application of suitable techniques (e.g. aDNA, radiogenic strontium isotopes, as well as oxygen and lead isotopes) to either hard and/or soft tissues. However, the limited preservation of coexisting hard and soft human tissues hampers the possibilities of investigating high-resolution diachronic mobility periods in the life of a single individual. Here, we present the results of a multidisciplinary study of an exceptionally well preserved circa 3.400-year old Danish Bronze Age female find, known as the Egtved Girl. We applied biomolecular, biochemical and geochemical analyses to reconstruct her mobility and diet. We demonstrate that she originated from a place outside present day Denmark (the island of Bornholm excluded) and that she travelled back and forth over large distances during the final months of her life, while consuming a terrestrial diet with intervals of reduced protein intake. We also provide evidence that all her garments were made of non-locally produced wool. Our study advocates the huge potential of combining biomolecular and biogeochemical provenance tracer analyses to hard and soft tissues of a single ancient individual for the reconstruction of high-resolution human mobility.







Frozen Bodies





## Ötzi the Iceman

Ötzi, the Iceman, is the well-preserved natural mummy of a man who lived between 3400 and 3100 BC. The mummy was found in September 1991 in the Ötztal Alps, hence the nickname "Ötzi", near Similaun mountain and Hauslabjoch on the border between Austria and Italy. He is Europe's oldest known natural human mummy, and has offered an unprecedented view of Chalcolithic (Copper Age) Europeans. His body and belongings are displayed in the South Tyrol Museum of Archaeology in Bolzano, South Tyrol, Italy.

In 2009, a CAT scan revealed that the stomach had shifted upward to where his lower lung area would normally be. Analysis of the contents revealed the partly digested remains of ibex meat, confirmed by DNA analysis, suggesting he had a meal less than two hours before his death. Wheat grains were also found. It is believed that Ötzi most likely had a few slices of a dried, fatty meat, probably bacon, which came from a wild goat in South Tyrol. Analysis of Ötzi's intestinal contents showed two meals (the last one consumed about eight hours before his death), one of chamois meat, the other of red deer and herb bread; both were eaten with roots and fruits. The grain also eaten with both meals was a highly processed einkorn wheat bran, quite possibly eaten in the form of bread. In the proximity of the body, and thus possibly originating from the Iceman's provisions, chaff and grains of einkorn and barley, and seeds of flax and poppy were discovered, as well as kernels of sloes (small plum-like fruits of the blackthorn tree) and various seeds of berries growing in the wild.



Hair analysis was used to examine his diet from several months before. Pollen in the first meal showed that it had been consumed in a mid-altitude conifer forest, and other pollens indicated the presence of wheat and legumes, which may have been domesticated crops. Pollen grains of hop-hornbeam were also discovered. The pollen was very well preserved, with the cells inside remaining intact, indicating that it had been fresh (estimated about two hours old) at the time of Ötzi's death, which places the event in the spring or early summer. Einkorn wheat is harvested in the late summer, and sloes in the autumn; these must have been stored from the previous year. High levels of both copper particles and arsenic were found in Ötzi's hair. This, along with Ötzi's copper axe blade, which is 99.7% pure copper, has led scientists to speculate that Ötzi was involved in copper smelting.

By examining the proportions of Ötzi's tibia, femur and pelvis, Christopher Ruff has determined that Ötzi's lifestyle included long walks over hilly terrain. This degree of mobility is not characteristic of other Copper Age Europeans. Ruff proposes that this may indicate that Ötzi was a high-altitude shepherd.

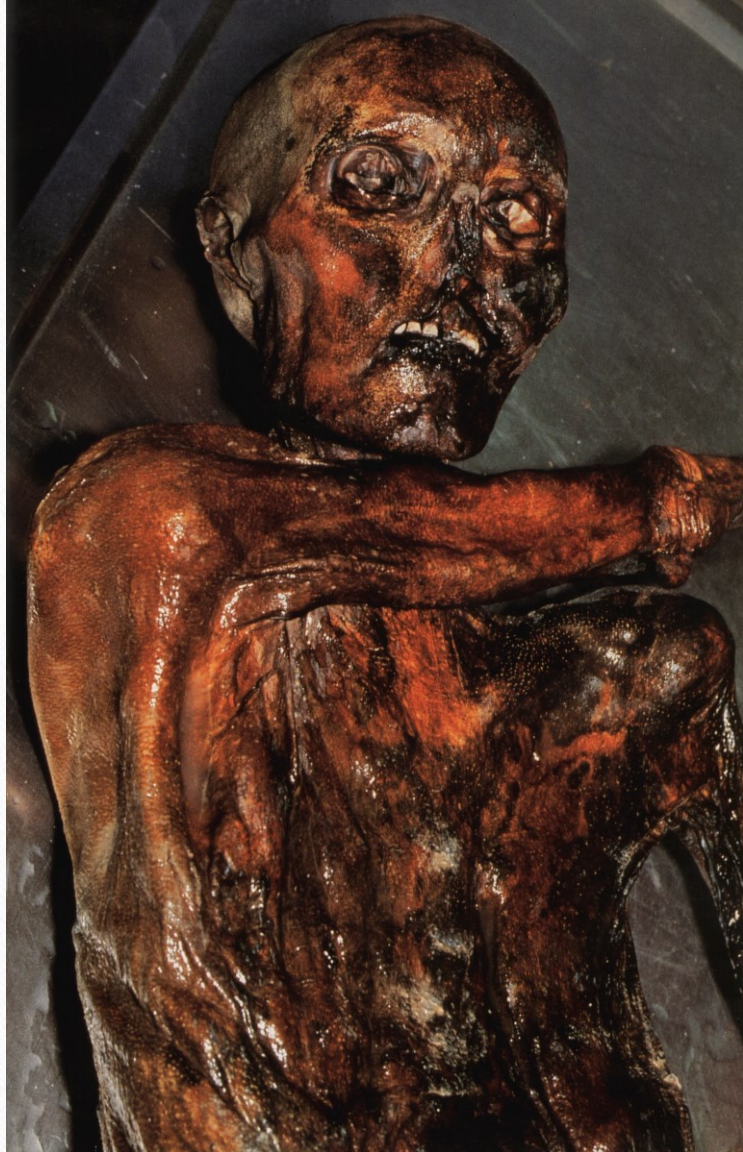
Using modern 3D scanning technology, a facial reconstruction has been created for the South Tyrol Museum of Archaeology in Bolzano, Italy. It shows Ötzi looking old for his 45 years, with deep-set brown eyes, a beard, a furrowed face, and sunken cheeks.













## Ötzi's clothes and shoes

Ötzi wore a mountain gear: cloak made of woven grass and a coat, a belt, a pair of leggings, a loincloth and shoes, all made of leather of different skins. He also wore a bearskin cap with a leather chin strap. The shoes were waterproof and wide, seemingly designed for walking across the snow; they were constructed using bearskin for the soles, deer hide for the top panels, and a netting made of tree bark. Soft grass went around the foot and in the shoe and functioned like modern socks. The coat, belt, leggings and loincloth were constructed of vertical strips of leather sewn together with sinew. His belt had a pouch sewn to it that contained a cache of useful items: a scraper, drill, flint flake, bone awl and a dried fungus.

The shoes have since been reproduced by a Czech academic, who said that "because the shoes are actually quite complex, I'm convinced that even 5,300 years ago, people had the equivalent of a cobbler who made shoes for other people". The reproductions were found to constitute such excellent footwear that it was reported that a Czech company offered to purchase the rights to sell them. However, a more recent hypothesis by British archaeologist Jacqui Wood says that Ötzi's shoes were actually the upper part of snowshoes. According to this theory, the item currently interpreted as part of a backpack is actually the wood frame and netting of one snowshoe and animal hide to cover the face. The leather loincloth and hide coat were made from sheepskin. Genetic analysis showed that the sheep species was nearer to modern domestic European sheep than to wild sheep; the items were made from the skins of at least four animals. Part of the coat was made from domesticated goat belonging to a mitochondrial haplogroup (a common female ancestor) that inhabits central Europe today. The coat was made from several animals from two different species and was stitched together with hides available at the time. The leggings were made from domesticated goat leather. A similar set of 6,500-year-old leggings discovered in Switzerland were made from goat leather which may indicate the goat leather was specifically chosen.

Shoelaces were made from the European genetic population of cattle. The quiver was made from wild roe deer, the fur hat was made from a genetic lineage of brown bear which lives in the region today. Writing in the journal *Scientific Reports*, researchers from Ireland and Italy reported their analysis of his clothing's mitochondrial DNA, which was extracted from nine fragments from six of his garments, including his loin cloth and fur cap.











# The cause of death debate

The cause of death remained uncertain until 10 years after the discovery of the body. It was initially believed that Ötzi died from exposure during a winter storm. Later it was speculated that Ötzi might have been a victim of a ritual sacrifice, perhaps for being a chieftain. This explanation was inspired by theories previously advanced for the 1st millennium BC. bodies recovered from peat bogs.

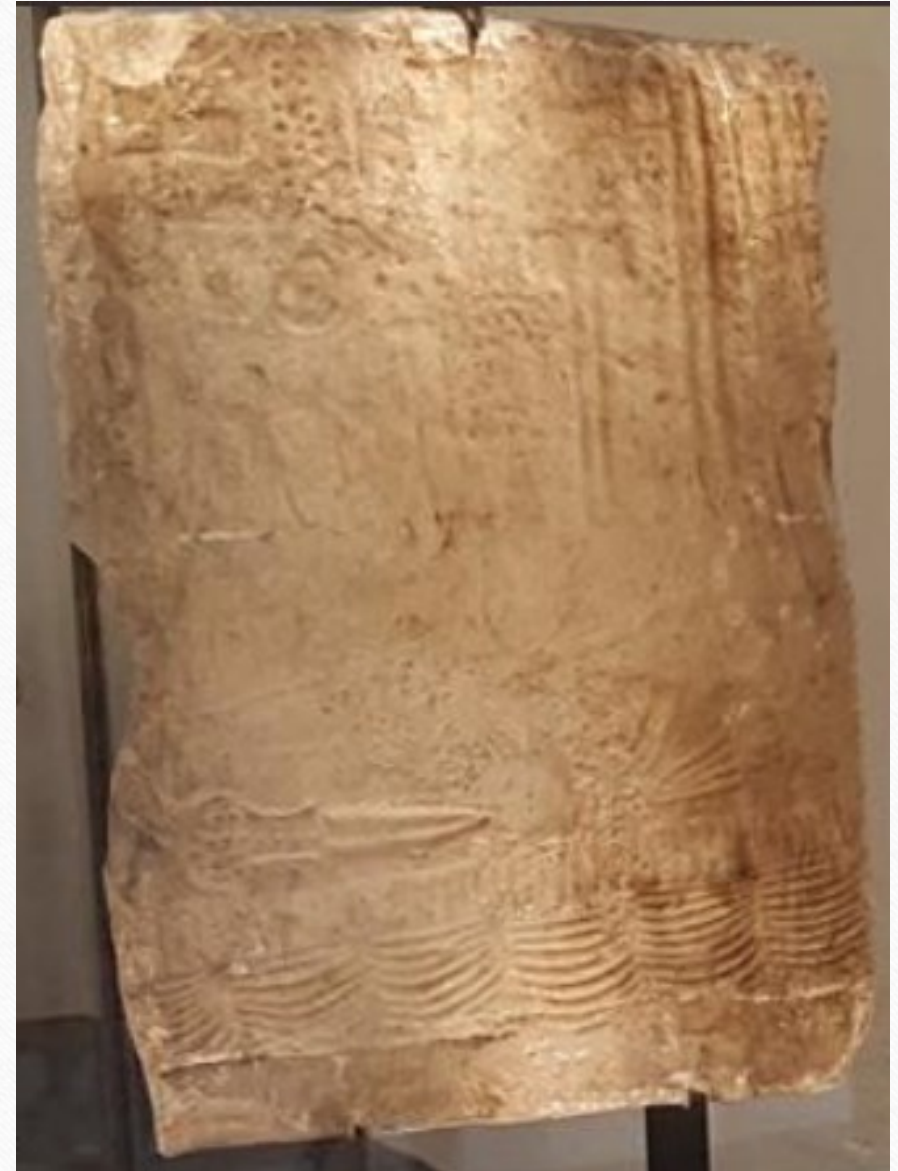
In 2001, X-rays and a CT scan revealed that Ötzi had an arrowhead lodged in his left shoulder when he died and a matching small tear on his coat. The discovery of the arrowhead prompted researchers to theorize Ötzi died of blood loss from the wound, which would probably have been fatal even if modern medical techniques had been available. Further research found that the arrow's shaft had been removed before death, and close examination of the body found bruises and cuts to the hands, wrists and chest and cerebral trauma indicative of a blow to the head. One of the cuts was to the base of his thumb that reached down to the bone but had no time to heal before his death. Currently, it is believed that Ötzi bled to death after the arrow shattered the scapula and damaged nerves and blood vessels before lodging near the lung. Recent DNA analyses claim they revealed traces of blood from at least four other people on his gear: one from his knife, two from a single arrowhead, and a fourth from his coat. Interpretations of these findings were that Ötzi killed two people with the same arrow and was able to retrieve it on both occasions, and the blood on his coat was from a wounded comrade he may have carried over his back. Ötzi's posture in death (frozen body, face down, left arm bent across the chest) could support a theory that before death occurred and rigor mortis set in, the Iceman was turned onto his stomach in the effort to remove the arrow shaft.

In 2010, it was proposed that Ötzi died at a much lower altitude and was buried higher in the mountains, as posited by archaeologist Alessandro Vanzetti (Rome) and his colleagues. According to their study of the items found near Ötzi and their locations, it is possible that the iceman may have been placed above what has been interpreted as a stone burial mound but was subsequently moved with each thaw cycle that created a flowing watery mix driven by gravity before being re-frozen. While archaeobotanist Klaus Oeggl agrees that the natural process described probably caused the body to move from the ridge that includes the stone formation, he pointed out that the paper provided no compelling evidence to demonstrate that the scattered stones constituted a burial platform. Moreover, biological anthropologist Albert Zink argues that the iceman's bones display no dislocations that would have resulted from a downhill slide and that the intact blood clots in his arrow wound would show damage if the body had been moved up the mountain. In either case, the burial theory does not contradict the possibility of a violent cause of death.



# Laces stela, a key to the mystery of Ötzi's death?

In 2001, and thus ten years after the Iceman's discovery, Ötzi's mummy underwent further examinations. A team around radiologist Dr. Paul Gostner and pathologist Dr. Egarter Vigl scrutinized the mummy with an X-ray unit and discovered something amazing: They found an arrowhead in his left shoulder! No scientist before them had seen the obvious. The arrowhead of flint is 27mm long and 18mm wide. It wasn't removed by the scientists and can still be seen in Ötzi's body. Ötzi was hit by an arrow. Was he murdered? There is a very special, mysterious motif on the backside of the Laces stela: A bowman points his arrow at the back of another person.





# A Murder Theory

Was anybody after his blood? For quite some time? Stress symptoms at the fingernails prove that Ötzi was in a life-threatening danger during the last two weeks before his death. The position of the arrowhead – Ötzi was shot from behind – makes it clear that an intentional murder was planned. Ötzi thus had a turbulent past and finally had to die a violent death and not a heroic death in the course of a fair duel. His enemies became stronger and stronger, which led to power struggles in his own ranks. Ötzi's status was more and more weakened. Finally, there even might have been violent conflicts with serious physical injuries that, in the end, led him to seek salvation in flight. Ötzi left Val Venosta and fled to the Ötztal Alps. But his pursuers gave him no chance. Ötzi's fate was sealed on an autumn day about 5300 years ago. An arrow shot from ambush smashed his shoulder and injured the aorta so that the man bled to death within a short time. To leave no traces the murderer removed the arrow shaft and took his heels. Soon afterwards the crime scene disappeared under a thick blanket of snow and the crime remained unpunished.

Was Ötzi an injured person on the run, was he on his way across the Alps as a copper trader or a victim of a robbery with murder? Or was he a disempowered chief or shaman? „We don't have enough knowledge to give a definitive answer,“ says Walter Leitner. "But we tend to think that Ötzi was seen as an eccentric due to his probably outstanding spiritual faculties and not least because of his mountaineer outfit, which definitely wasn't the Neolithic everyday wear down in the valley. Under this aspect it could be considered that it might have been a murder for hire in the context of a political power struggle or even a ritual execution, but can hardly be proved. Another theory is that Ötzi was killed in a sacrificial ritual.

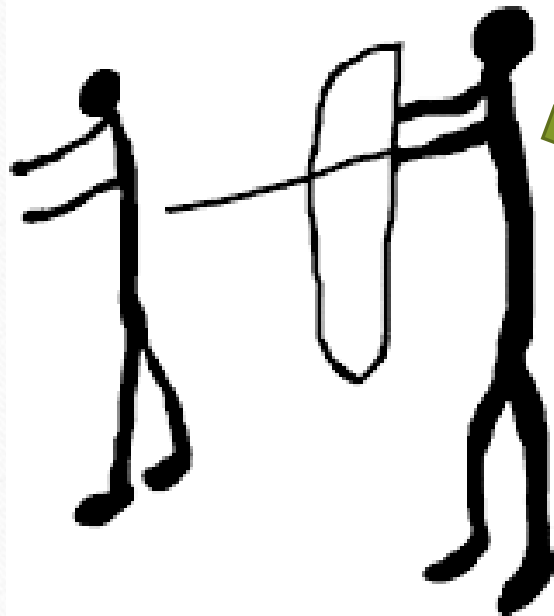


## A Ritual death theory

There is a very special, mysterious motif on the back side of the Laces stela: A bowman who points his arrow at another person from behind. This motif is unique for the stela of the Adige Valley group. What does this scene represent? Is it a murder scene or just a hunting scene of two hunters hunting together? It's maybe a long shot to see a connection with the death of Ötzi the Iceman, as Ötzi died a few hundred years earlier, but it can't be ruled out completely. Ötzi's death place is only a 20 km linear distance away from the site of Laces stela.

### A Sacrifice?

It may be well possible, that Ötzi was purposefully sacrificed and such ritual practice was not an exception during the Copper Age in the Alpine region. Something similar to the archer ritual sacrifice at Stonehenge, described in lesson 12:2.





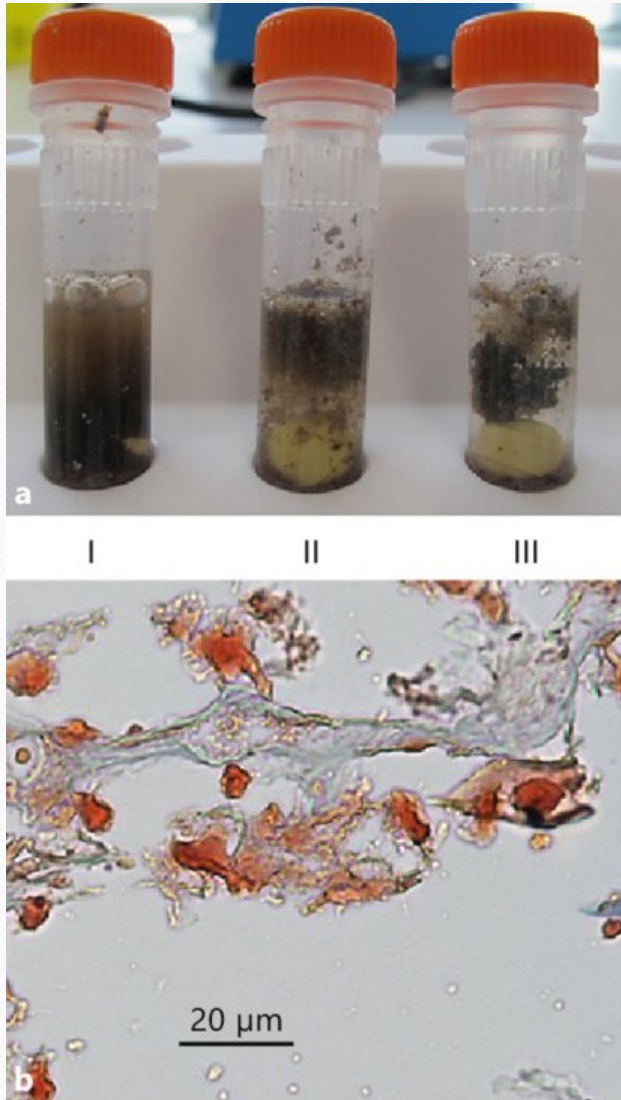
Albert R. Zink & Frank Maixner The Current Situation of the Tyrolean Iceman, *Gerontology* 65(6):1-8,  
Doi: 10.1159/000501878

The Tyrolean Iceman, commonly known as Ötzi, is the world's oldest glacier mummy and one of the best investigated ancient human remains in the world. Since the discovery of the 5,300-year-old Copper Age individual in 1991, in a glacier in the Eastern Italian Alps, a variety of morphological, biochemical, and molecular analyses have been performed that revealed important insights into his origin, his life habits, and the circumstances surrounding his demise. In more recent research, the mummy was subjected to cutting-edge modern research methodologies currently focusing on high-throughput sequence analysis of ancient biomolecules (DNA, proteins, lipids) that are still preserved in the mummified tissues. This application of innovative “-omics” technologies revealed novel insights on the ancestry, disease predisposition, diet, and the presence of pathogens in the glacier mummy. In this review, the most important and actual results of the molecular studies will be highlighted.

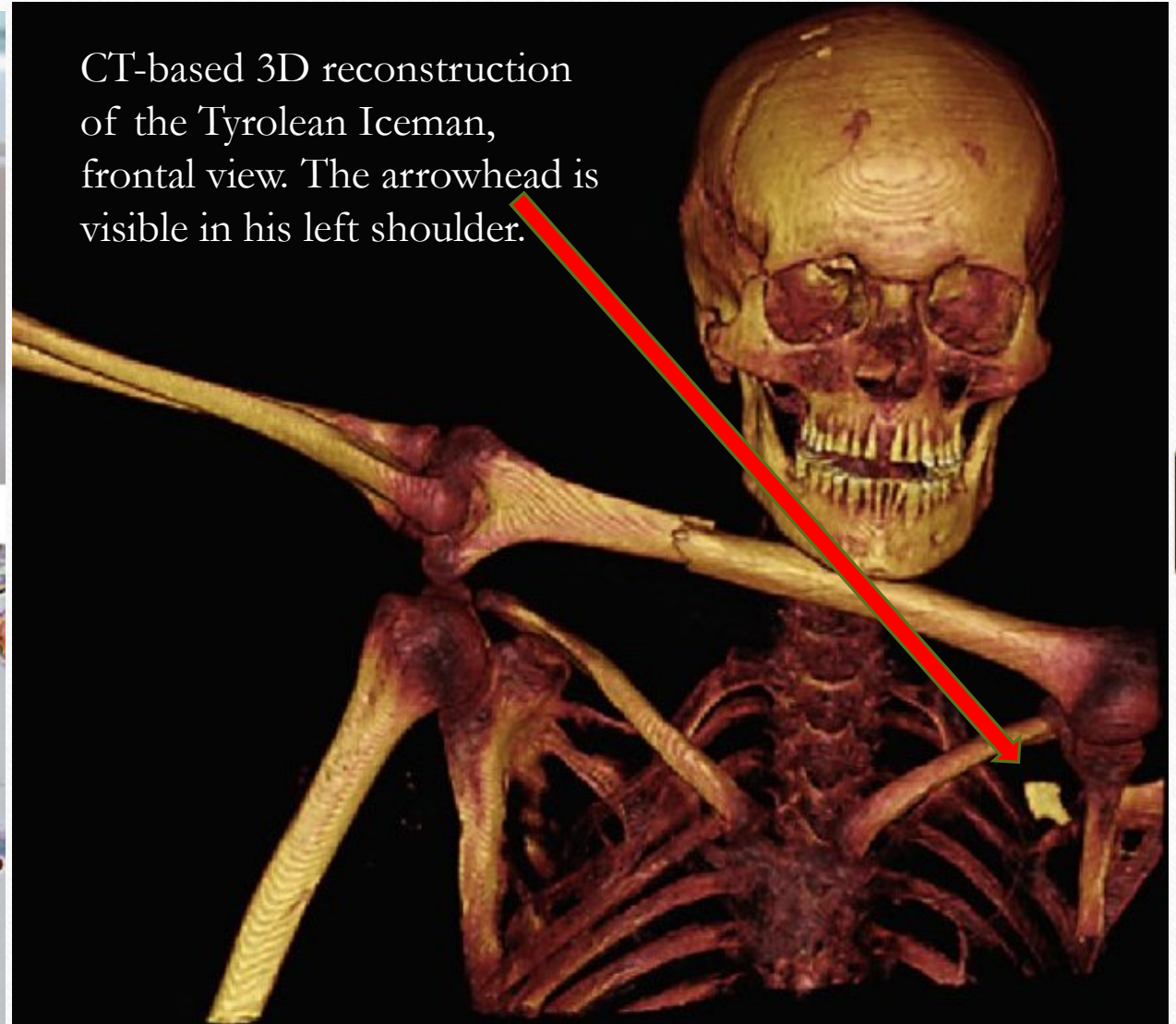




Macroscopic and histological investigations of different Iceman's intestinal samples. a Re-hydration of colon (I), duodenum (II), and stomach (III) samples in phosphate buffer shows hydrophobic "fatty-like" character of the stomach content. b Histological analysis of a stomach content tissue sample. Adipocytes are highlighted in orange after Sudan III staining.



CT-based 3D reconstruction of the Tyrolean Iceman, frontal view. The arrowhead is visible in his left shoulder.







Birch  
bark  
bucket

Animal and plant macro remains detected microscopically in the Iceman stomach content. a Loose bundle of muscle fibers. The scale bar indicates 100  $\mu\text{m}$ . b Zoomed-in view of one muscle fiber showing the striated fiber structures. The scale bar indicates 20  $\mu\text{m}$ . c Part of a wheat grain spikelet. The scale bar indicates 500  $\mu\text{m}$ .



**Albert R. Zink – Marco Samadelli – Paul Gostner – Dario Piombino Mascali 2018:**  
**Possible evidence for care and treatment in the Tyrolean Iceman,** *International Journal of Paleopathology* 25, doi: 10.1016/j.ijpp.2018.07.006

**Abstract:**

The Tyrolean Iceman is the world oldest glacier mummy. He was found in September 1991 in the Italian part of the Ötztal Alps. Since his discovery a variety of morphological, radiological and molecular analyses have been performed that revealed detailed insights into his state of health. Despite the various pathological conditions found in the Iceman, little is known about possible forms of care and treatment during the Copper Age in Northern Italy. A possible approach to this topic is the presence of tattoos on the mummified body. In previous work, it was already believed that the tattoos were administered as a kind of treatment of his lower back pain and degenerative joint disease of his knees, hip and wrist. In other studies, the tattoos of the Iceman have been related to an early form of acupuncture. We carefully re-evaluated the various health issues of the Iceman, including joint diseases, gastrointestinal problems and arterial calcifications and compared them to the location and number of tattoos. Together with the finding of medically effective fungi and plants, such as the birch polypore or fern in his equipment and intestines, we suggest that care and treatment was already common during the Iceman's time.



**Brain injury**

**Dental disease**

Caries, Periodontitis

**Healed rib fractures**

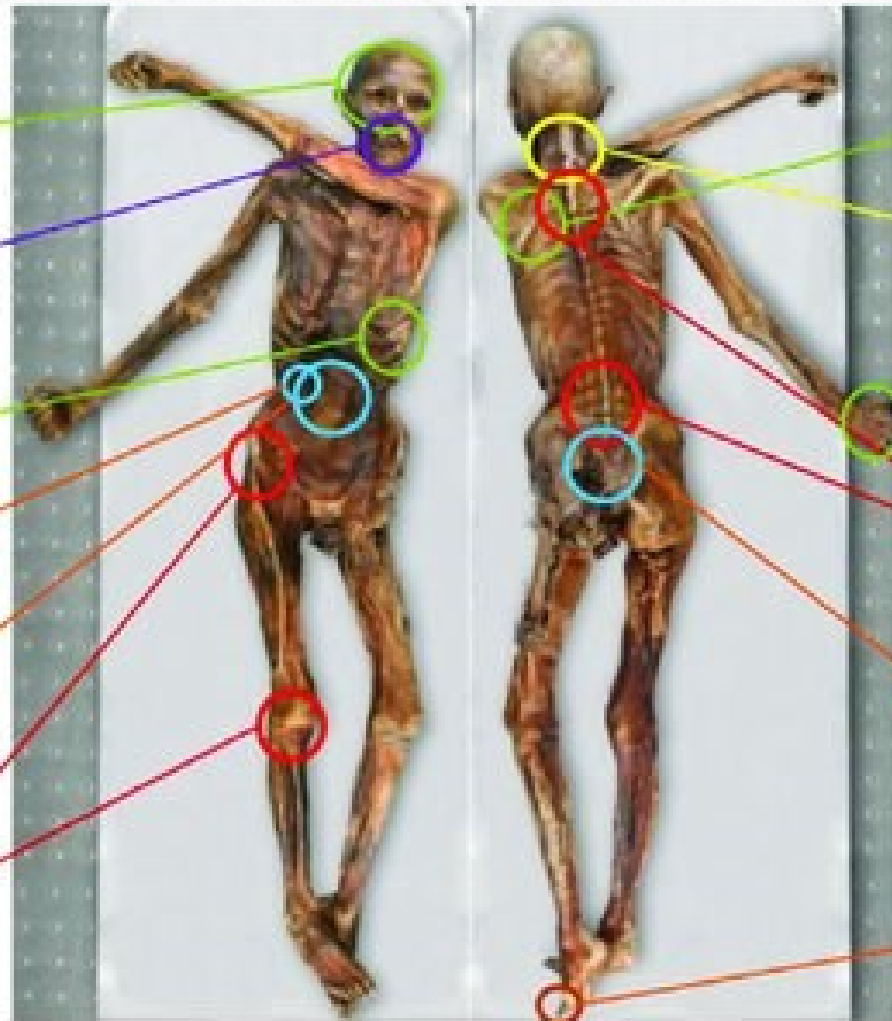
**Gallbladder stones**

**Stomach problems**

Helicobacter pylori infection

**Degenerative disease**

Hip and knee joints



**Arrow shot**

**Atherosclerosis**

**Cut wound**

**Back pain**

Cervical and lumbar spine

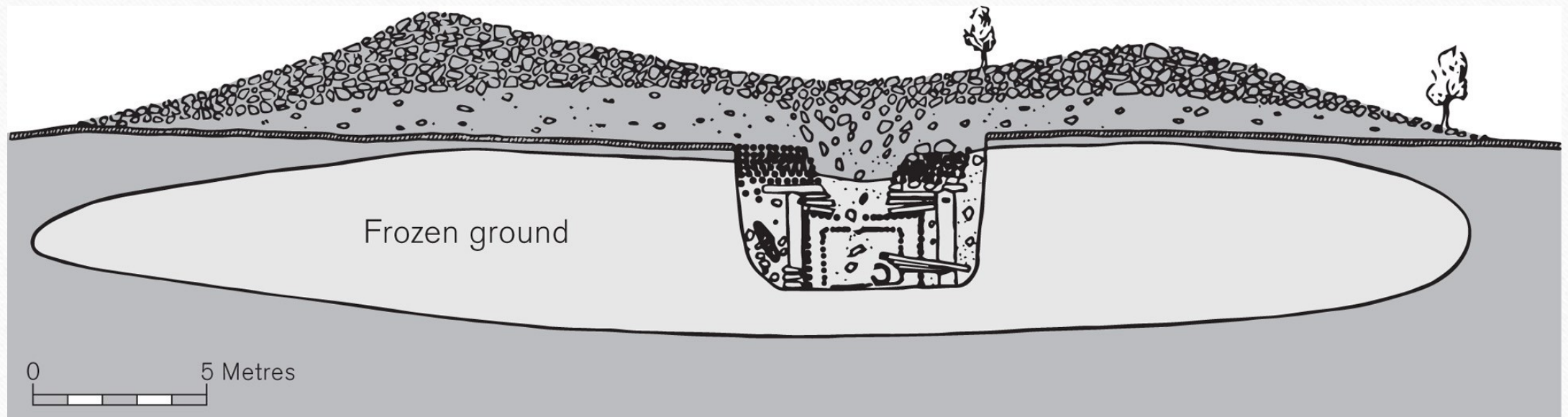
**Intestinal parasites**

**Frostbite**



# Pazyryk Culture: Kurgan burials in the Altai

In the Altai Mountains of Russia and Mongolia there are a number of incredibly well-preserved burials of the Pazyryk culture. The people of the Pazyryk culture were horse-riding nomads, and some gained wealth through trade. The Pazyryk burials consist of wooden chambers covered by large cairns of stone. They are generally dated to the 5th – 3rd centuries BC. The cairns covering the burials have produced a cooling effect, leading to the development of permafrost below, and saving the organic artefacts from degradation. The wide array of finds contain Chinese silk, wooden furniture and horses. The skin of the mummies show elaborate tattoos.





The Pazyryk culture is a Scythian nomadic Iron Age archaeological culture (c. 6th to 3rd centuries BC) identified by excavated artifacts and mummified humans found in the Siberian permafrost, in the Altay Mountains, Kazakhstan and nearby Mongolia. The mummies are buried in long barrows (or kurgans) similar to the tomb mounds of Scythian culture in Ukraine. The type site are the Pazyryk burials of the Ukok Plateau. Many artifacts and human remains have been found at this location, including the Siberian Ice Princess, indicating a flourishing culture at this location that benefited from the many trade routes and caravans of merchants passing through the area. The Pazyryk are considered to have had a war-like life.

Other kurgan cemeteries associated with the culture include those of Bashadar, Tuekta, Ulandryk, Polosmak and Berel. There are so far no known sites of settlements associated with the burials, suggesting a purely nomadic lifestyle.

Because of a freak climatic freeze, some of the Altai burials, notably those of the 5th century BC at Pazyryk and neighbouring sites, such as Katanda, Shibe, and Tuekt, were isolated from external climatic variations by a protective layer of ice that conserved the organic substances buried in them. At Pazyryk these included the bodies of horses and an embalmed man whose body was covered with tattoos of animal motifs.



The first tomb at Pazyryk, barrow 1, was excavated by the archaeologist M. P. Gryaznov in 1929; barrows 2-5 were excavated by Sergei Ivanovich Rudenko in 1947-1949. While many of the tombs had already been looted in earlier times, the excavators unearthed buried horses, and with them immaculately preserved cloth saddles, felt and woven rugs including the world's oldest pile carpet a 3 meter high four-wheel funeral chariot from the 5th century BC and other splendid objects that had escaped the ravages of time. These finds are now exhibited at the Hermitage Museum in Saint Petersburg. Unfortunately due to mid-20th Century excavation techniques in remote areas of Siberia the human remains when defrosted started decomposing rapidly and therefore only fragments survived.



Pazyryk 1940s  
excavations  
Tomb No. 5  
Defrosted male  
mummy, after  
S. I. Rudenko



# Siberian Ice Maiden of Ukok

The most famous undisturbed Pazyryk burial so far recovered is the Ice Maiden or "Altai Lady" found by archaeologist Natalia Polosmak in 1993 at Ukok, near the Chinese border. The find was a rare example of a single woman given a full ceremonial burial in a wooden chamber tomb in the fifth century BC, accompanied by six horses. She had been buried over 2,400 years ago in a casket fashioned from the hollowed-out trunk of a Siberian larch tree. On the outside of the casket were stylized images of deer and snow leopards carved in leather. Shortly after burial the grave had apparently been flooded by freezing rain, and the entire contents of the burial chamber had remained frozen in permafrost. Six horses wearing elaborate harnesses had been sacrificed and lay to the north of the chamber. The maiden's well-preserved body, carefully embalmed with peat and bark, was arranged to lie on her side as if asleep. She was young, and her hair was shaven off but she was wearing a wig and tall hat; she had been 167 centimetres tall. Even the animal style tattoos were preserved on her pale skin: creatures with horns that develop into flowered forms. Her coffin was made large enough to accommodate the high felt headdress she was wearing, which was decorated with swans and gold-covered carved cats. She was clad in a long crimson and white striped woollen skirt and white felt stockings. Her yellow blouse was originally thought to be made of wild "tussah" silk but closer examination of the fibres indicate the material is not Chinese but was a wild silk which came from somewhere else, perhaps India. Near her coffin was a vessel made of yak horn, and dishes containing gifts of coriander seeds: all of which suggest that the Pazyryk trade routes stretched across vast areas of Iran. Similar dishes in other tombs were thought to have held *Cannabis sativa*, confirming a practice described by Herodotus but after tests the mixture was found to be coriander seeds, probably used to disguise the smell of the body. Two years after the discovery of the "Ice Maiden" Dr. Polosmak's husband, Vyacheslav Molodin, found a frozen man, elaborately tattooed with an elk, with two long braids that reached to his waist, buried with his weapons.



**The Ukok**  
**Mummies** with  
tattoos and  
sacrificed horses  
on top of burial  
chamber.  
Rudenko's  
excavation below







DRAWINGS BY YELENA SHUMAKOVA  
AND WILLIAM H. BOND





The burial chamber of Kurgan Ak Alakha 3, With the mummy frozen in its larch coffin. Remains of sacrificed horses can also be seen.





Watch the video: <https://www.youtube.com/watch?v=UCmeU2-zBGo>



## Greenland mummies

Were discovered in a remote area called Qilakitsoq, Greenland in 1972. A total of eight natural mummies were found in two separate graves protected by an overhanging rock. The natural mummification was produced by freezing temperatures and dry, dehydrating winds. The mummies are of six women and two small children. They have been dated to around 1425-1525 AD. The Qilakitsoq mummies are the oldest known finds of mummies and clothing in the Arctic. Most of the clothing preserved with the mummies is made of seal skin. Just as was the case with Ötzi, five of the women have tattoos, in this case facial tattoos.

Even though these mummies have been well studied, the question of cause of death is still unanswered. It is not common for the Inuit to bury women and children away from the men. It was originally believed that they all drowned in a umiaq accident (which is a boat type for women), but there is no evidence to support this. Other possibilities are hypothermia, food poisoning or disease. There is no evidence of malnourishment.



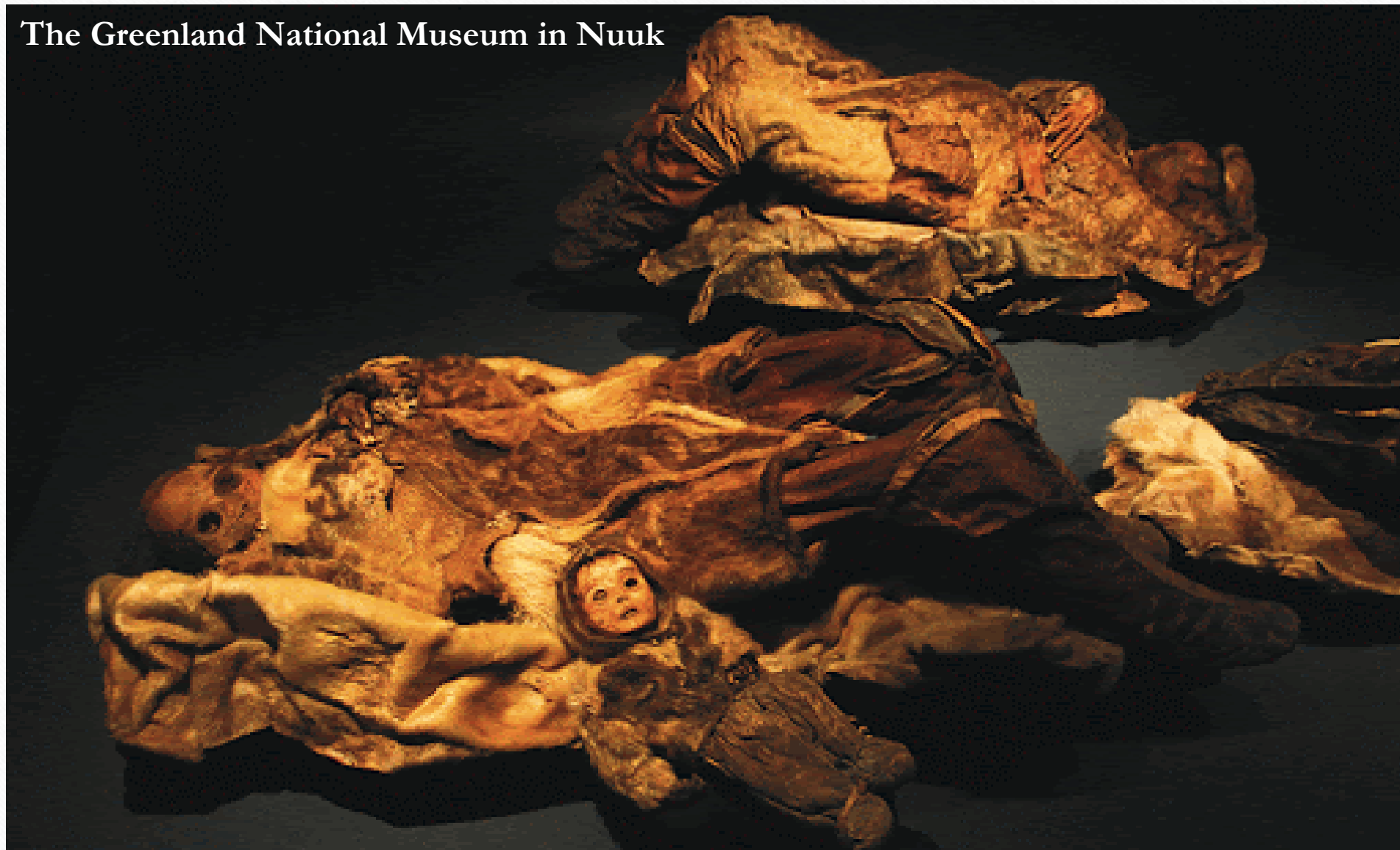
Hansen, Meldgaard & Nordqvist 1991: The Greenland Mummies. McGill-Queen's UP.







The Greenland National Museum in Nuuk

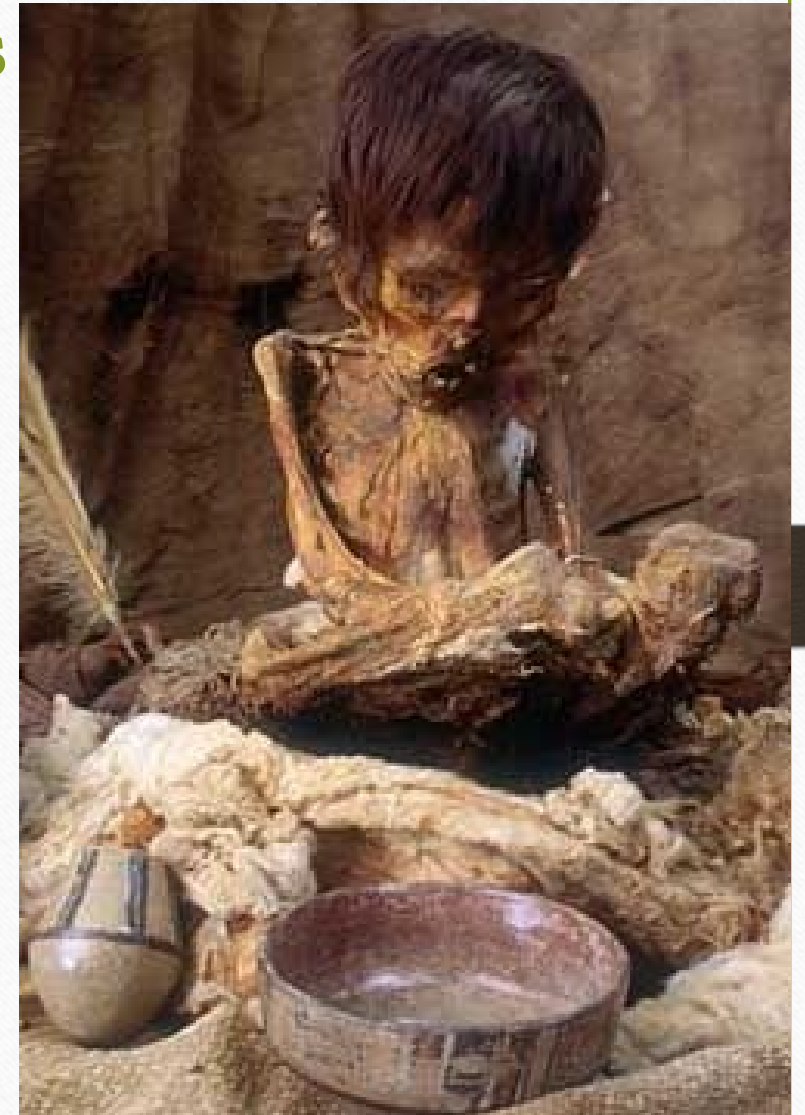




# Inca child sacrifices in the high Andes

A number of child mummies have been discovered on mountaintops in the Andes. They are human sacrifices from Inca times, connected to the so-called Capacocha ceremony. Humans and gifts were sent to Cuzco and then onwards to sacred places within the Inca realm. Some of these places were mountaintops.

One particularly interesting site has been found on top of the Lullaillaco Volcano, where a ceremonial structure was situated. Archaeological excavations revealed three mummies – a young woman and two children. Preservation conditions were excellent due to the very cold conditions at high altitude. Among the artefacts were a figurines of gold and silver, a feathered headdress, clothing, ceramics and wooden objects. Studies of changes in the isotopes of the hair show that the children had a change in diet about a year before they died, probably when they were chosen for the capacocha ceremony. There are also isotope indications that the children began their journey to the mountain several months prior to their death.



**Watch this video:** <https://www.smithsonianmag.com/travel/fascinating-afterlife-perus-mummies-180956319/>



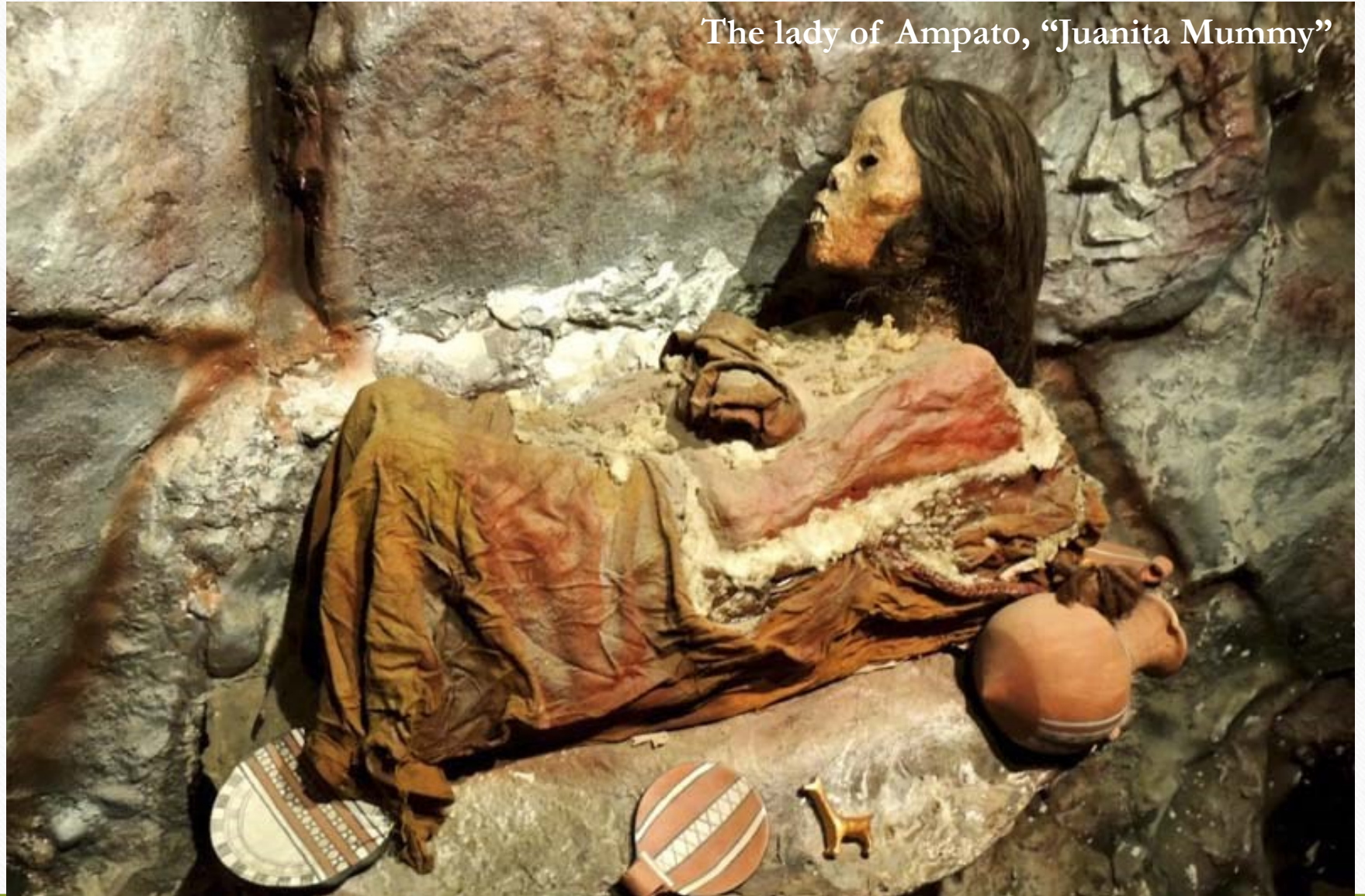


A thirteen year old Inca girl, found 1999 at an height of 6700 m, on top of the Lullailaco Volcano, together with two smaller children. Source: NBC News.



## Arequipa Mummies - Peru

Approximately in the year 1540, the volcano Sabancaya erupted, and the locals to placate the wrath of the volcano offered 3 live girls as a sacrifice. These had to be worshiped by the people of the place for some years, but with the passage of time they fell into oblivion, perhaps because it was very difficult to ascend to the mountain of more than 6 thousand meters of height.



The lady of Ampato, "Juanita Mummy"



# Chehrabad Salt Man (Iran)



## " SALT MAN "

In the winter of 1993, miners working in a salt mine, came across a body with long hair , a beard, and some artifacts .

The finds included the remains of a body , a foreleg inside a leather boot, three iron knives, a woolen half trouser, a silver needle or ear cleaner, a sling, parts of a leather rope, a grindstone, a walnut, some pottery shares, some designed textile fragments, and finally a few broken bones.

The salt mines are located at the foot of the hills facing the Chehrabad river, on the Southern part of the Hamzelloo village.

The mentioned body had been buried in the middle of one tunnel of approximately 45 meters length .

After archeological studies wich included C14 dating of different samples of bones and textiles, the saltman was dated to 1700 years ago . By testing a sample of hair, the blood group B+ , was determined . By using DNA dactyloscopy, the age of 37 and the height of 175cm were determined .

Three dimensional pictures (c.t scans) show the fractures around the eye and various damages that ocured before death as result of a hard blow .

Visual characteristics presented long hair and beard and a golden earring on the left ear indicating that he was a highranked man .

But the cause of his presence and death in the salt mine of chehrabad remains a mystery .





The site of salt mines at Douzlakh, Zanzan, Iran, where at least eight mummified human remains have been recovered







In 1994, commercial salt mining operations were being carried out in the Chehrabad Salt Mine when the first saltman was discovered. Along with his mummified remains, several artifacts, including iron knives and a gold earring, were also uncovered.

This saltman is easily recognized due to his long white hair and beard. His head is currently on display in a glass case in the National Museum of Iran (in Tehran). It has been estimated that the man lived around 1700 years ago, during the time of the Sasanian Empire, and died sometime between the ages of 35 and 40.

### Studying the Saltmen

In the following years more saltmen were discovered. In 2004, another saltman was found by miners, and an emergency excavation campaign was undertaken. Saltmen were also discovered in 2005, and the most recent mummy was uncovered in 2007. It is believed that the men lost their lives in the mine as a result of mining accidents. Whilst the first saltman is being kept in the National Museum of Iran, the subsequent four were brought to the Zanzan Archaeology Museum. The sixth saltman has been left in-situ.

The discovery of the saltmen has allowed archaeologists to get a glimpse into the lives of these ancient salt miners, and much scientific research has been conducted on the mummies, as well as the mine itself, since they were discovered more than two decades ago. Areas in which such research is being performed include archaeobotany, archaeozoology, isotope analysis, mining archaeology and physical anthropology.





Salt mummy no. 4, Archaeological Museum Zanzibar (photograph: Deutsches Bergbau-Museum).





Textile fragment, length c. 520 mm, Archaeological Museum Zanzan (photograph: Miras Farhangi).



Iron pick with wooden handle, length c. 210mm, Archaeological Museum Zanzan (photograph: Deutsches Bergbau-Museum).



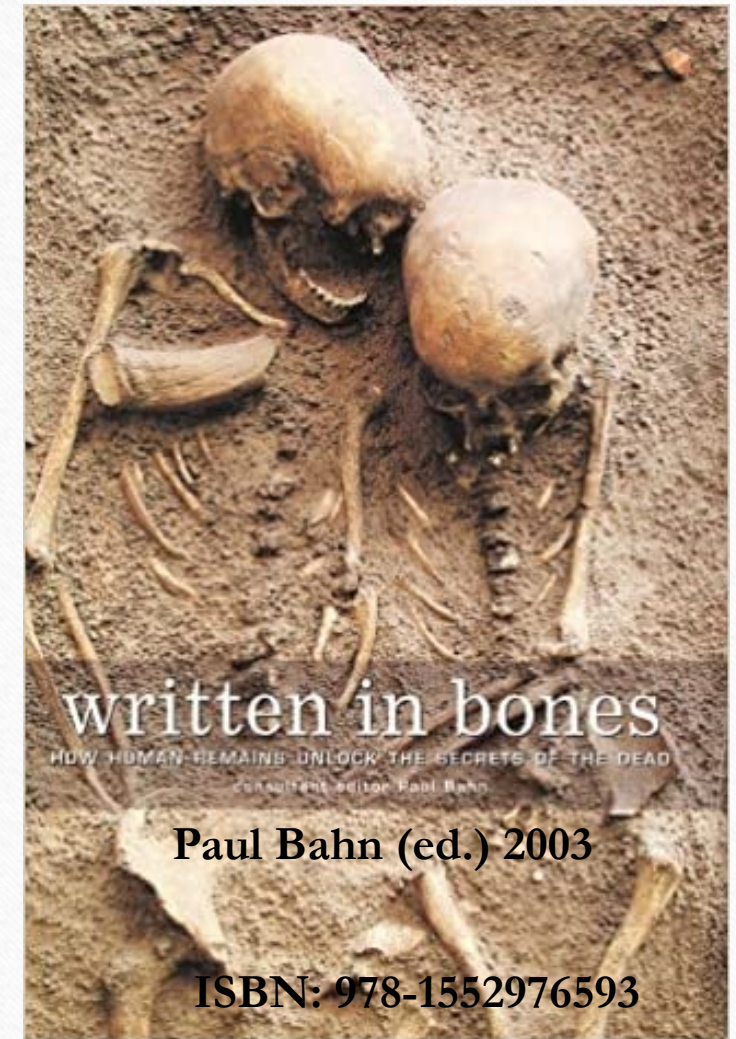
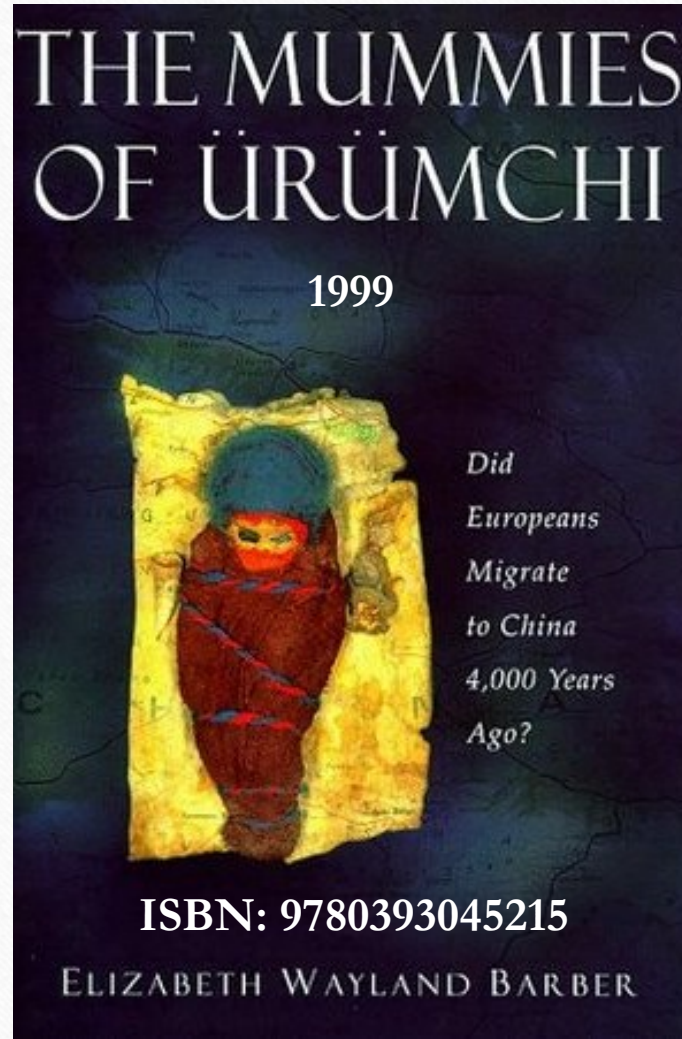
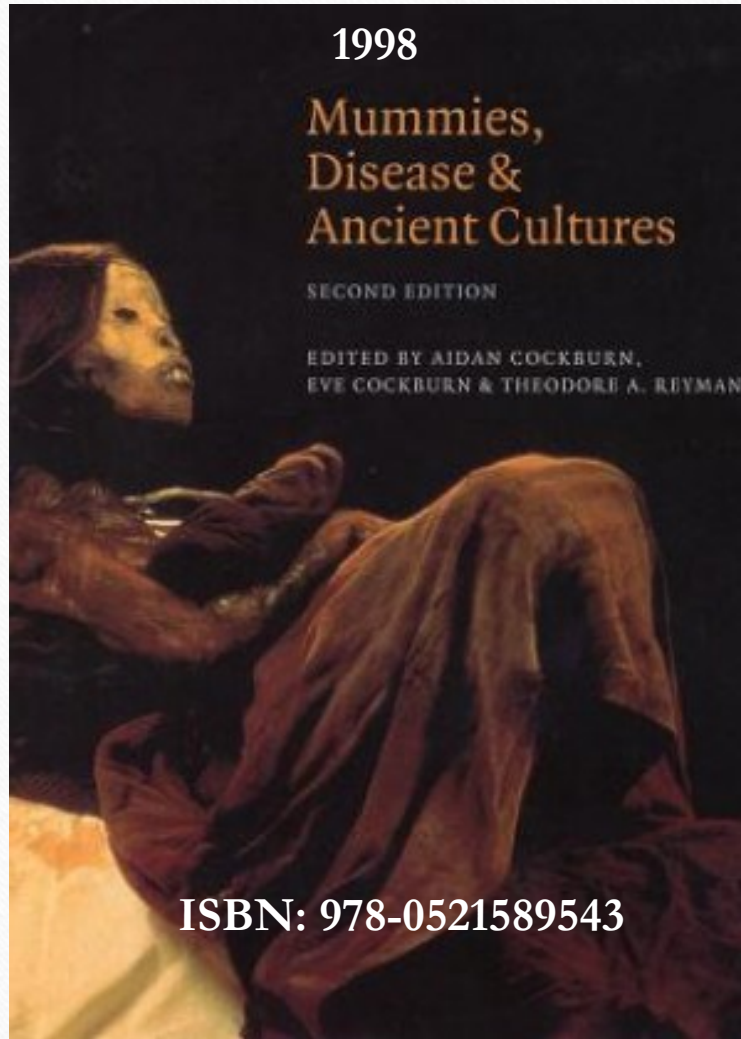


Pompei gypsum casts of  
burned body negatives  
79 A.D.





## Further reading

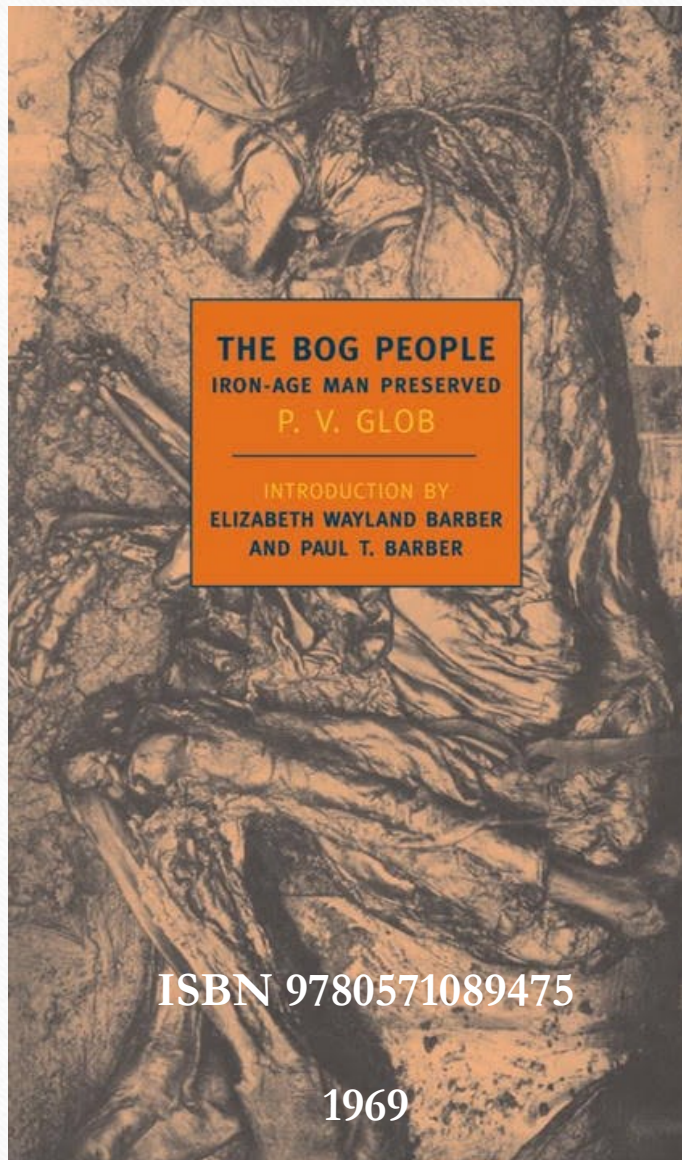






# THE BIOARCHAEOLOGY OF MUMMIES

KENNETH C. NYSTROM 2018  
ISBN: 978-1611328394

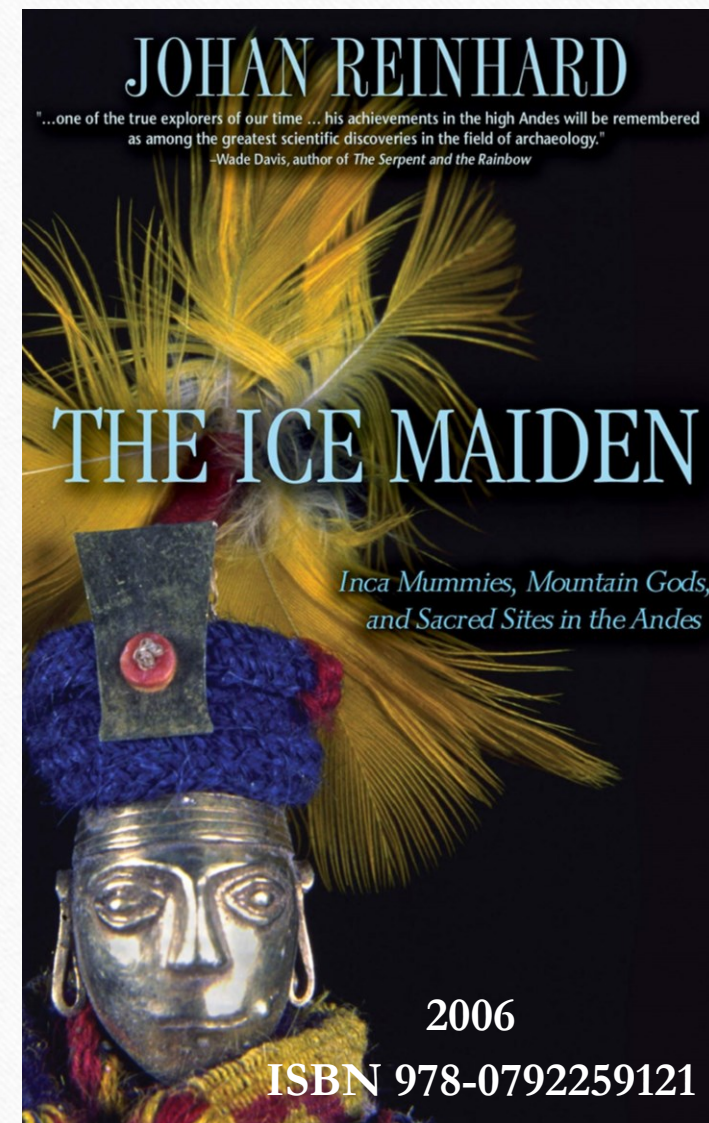


THE BOG PEOPLE  
IRON-AGE MAN PRESERVED  
P. V. GLOB

INTRODUCTION BY  
ELIZABETH WAYLAND BARBER  
AND PAUL T. BARBER

ISBN 9780571089475

1969



JOHAN REINHARD

"...one of the true explorers of our time ... his achievements in the high Andes will be remembered as among the greatest scientific discoveries in the field of archaeology."  
—Wade Davis, author of *The Serpent and the Rainbow*

# THE ICE MAIDEN

*Inca Mummies, Mountain Gods,  
and Sacred Sites in the Andes*

2006

ISBN 978-0792259121



# Archaeology of tattoos and body modification

The earliest unequivocal evidence for tattooing in the archaeological record, is the world-famous Ötzi, the Alpine glacial mummy of a Copper Age man (e.g. Fleckinger, 1999; 2018). Ötzi has around 61 tattoos on his body, consisting mostly of straight lines and crosses, created by rubbing charcoal into incised cuts, unlike the needle-poked tattoos. The prevailing opinion is that his tattoos, found on his ribcage, lumbar spine, wrist, knee, calves and ankles, serve therapeutic and pain-relieving purposes as they are all found on parts of his body with degenerative conditions or heavy wear and tear. Throughout of prehistory, tattoos played an important role in expression of cult, collective values and personal identity.



Pazyryk, Ukok Tomb II, male burial 600-300 BC

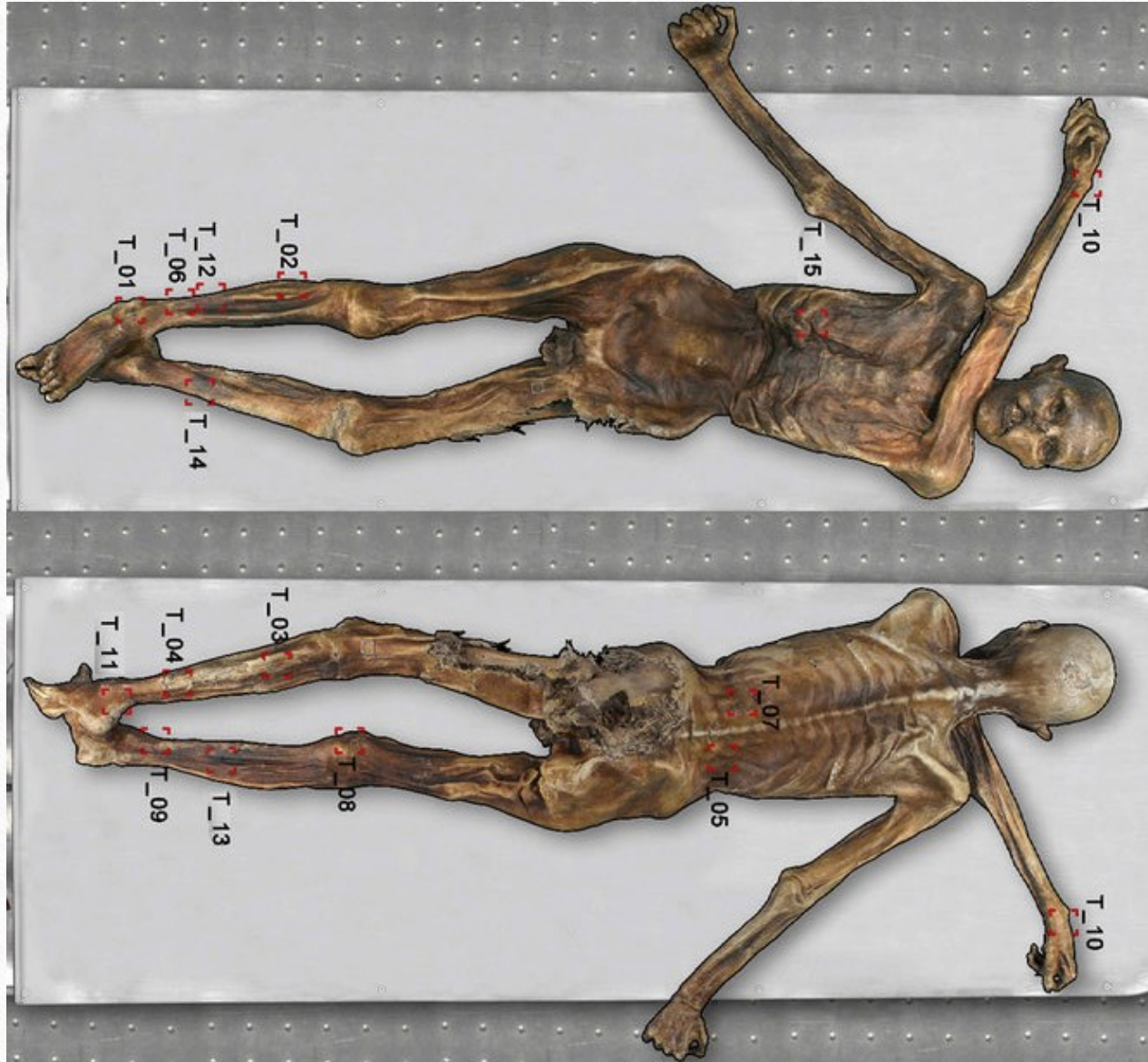


**Marco Samadelli 2015:** Complete mapping of the tattoos of the 5300-year-old Tyrolean Iceman, *Journal of Cultural Heritage* 16(5)  
Doi: 10.1016/j.culher.2014.12.005

This study documents for the first time the complete mapping of one of the world's most ancient tattoos present on a mummified human body dating back to over 5300 years ago, belonging to the so-called Iceman mummy. For this purpose, we utilised innovative non-invasive multispectral photographic imaging techniques capable of “seeing” in a range from IR to UV. An especially developed innovative software (HMI), which allows to measure and process the spectral reflectance sampled on seven bands with equidistant wavelengths for each pixel of scene acquired, has led us to identify and certify the presence of 61 tattoos divided into 19 groups in various parts of the body. The presence of the tattoos and their precise positioning on the mummy's body shall prove helpful in the future for the in-depth analysis of their relationship with recent scientifically acquired knowledge, to help determine the real function of tattooing in prehistoric times.

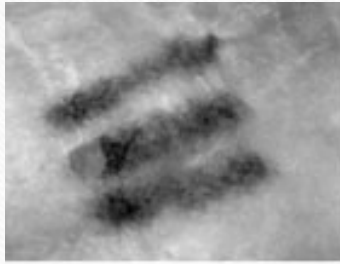






The mapping of all of the tattoos present on the mummy's body.

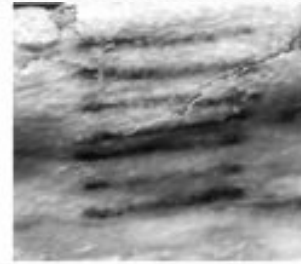




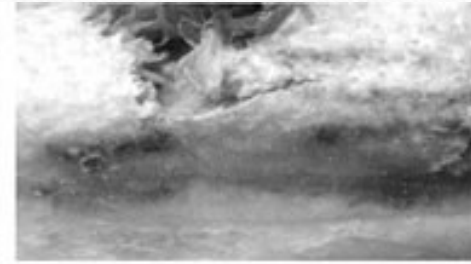
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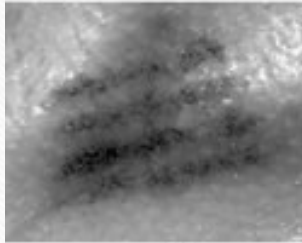
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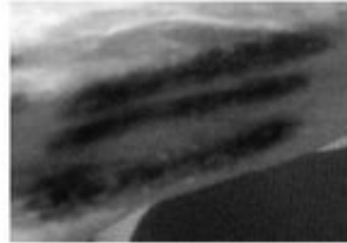
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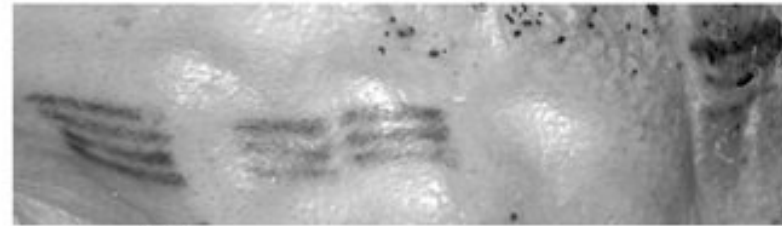
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T 05



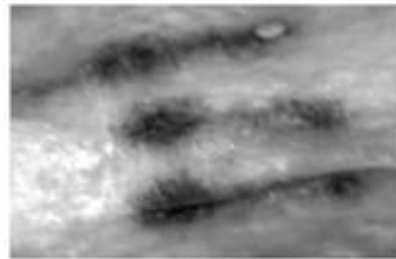
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T 07



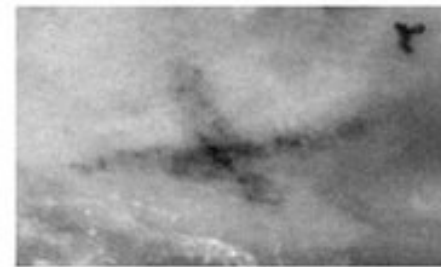
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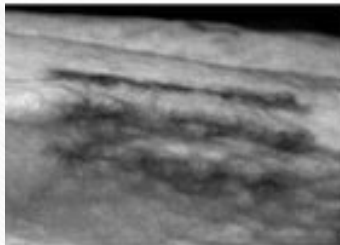
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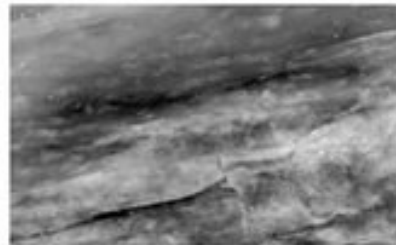
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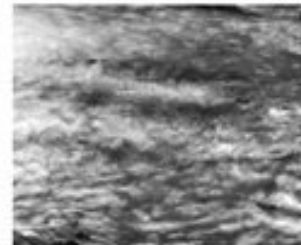
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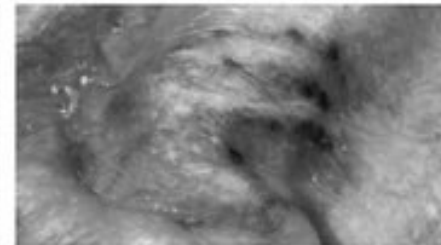
T 12



T 13



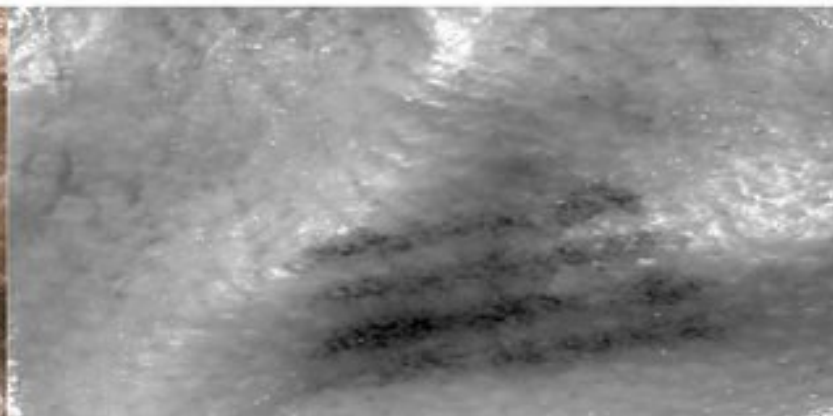
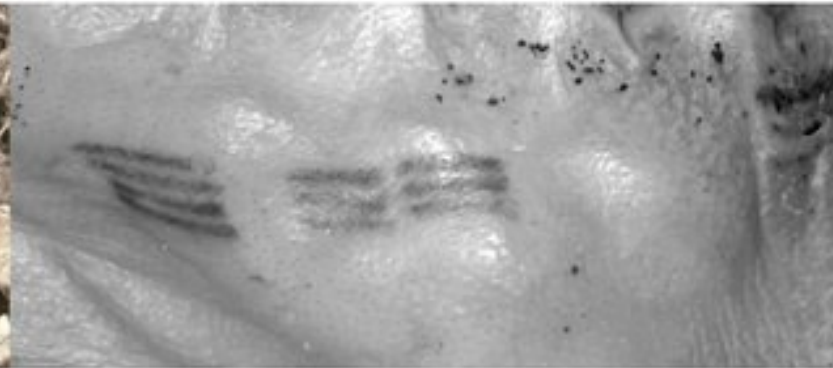
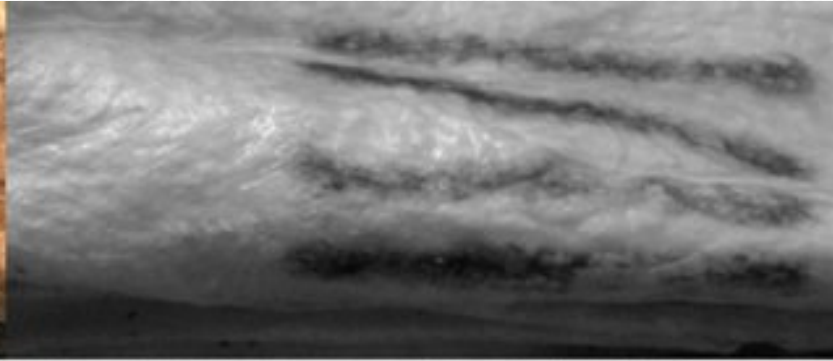
T 14



T 15

The set of tattoos seen through the results of the processing obtained by combining the HMI bands.





Comparison of tattoos (T 02, T 07, T 05) seen with the naked eye versus the results of the processing obtained by combining the HMI bands.

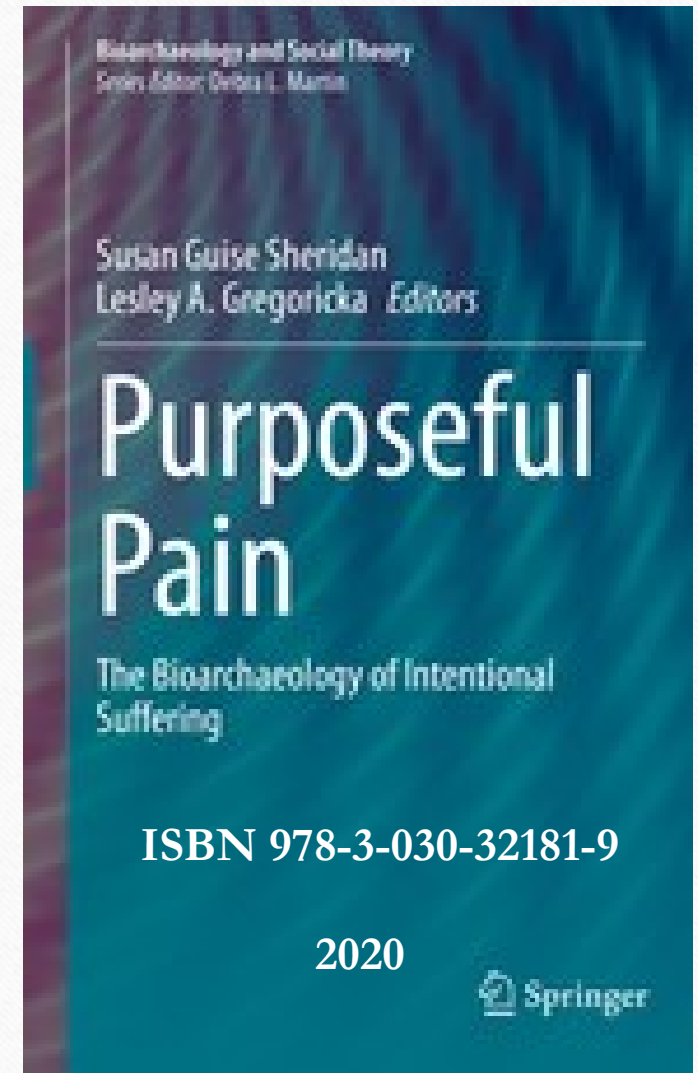


**Dario Piombino Mascali & Lars Krutak 2020: Therapeutic Tattoos and Ancient Mummies: The Case of the Iceman**, in: Sheridan, Susan Guise, Gregoricka, Lesley (Eds.) *Purposeful Pain. The Bioarchaeology of Intentional Suffering*,

doi: 10.1007/978-3-030-32181-9\_6

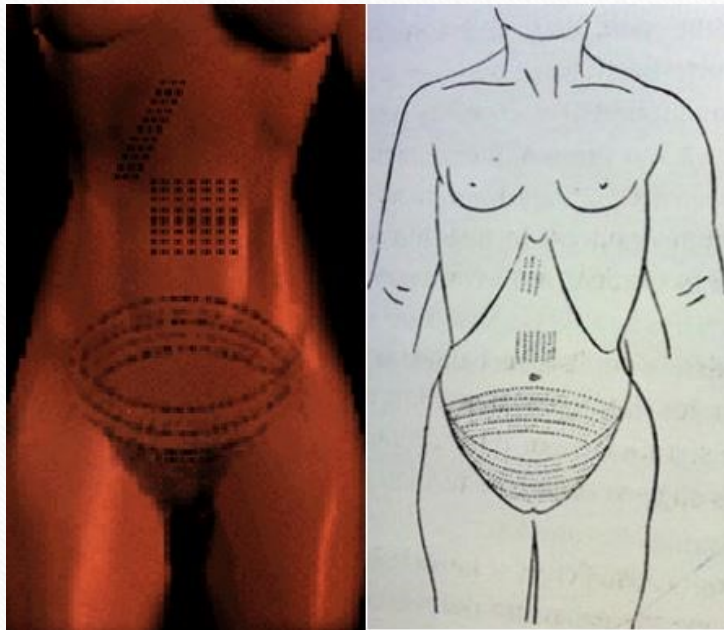
**Abstract:**

Tattoos have been reported from human remains representing a wide range of cultures and time periods. While the practice of tattooing can be studied using a variety of types of historical evidence, antiquity leaves only naturally and deliberately preserved human skin as a direct source. Today, scholarly research recognizes the Tyrolean Iceman known as Ötzi, dating from 5300 years ago, as the mummy with the oldest tattoos. A complete mapping of this mummy's tattoos was recently reported. This work has demonstrated the presence of 61 tattoos divided into 19 groups located on different parts of the body. The examination of these tattoos and their locations on the mummy's body are especially useful for helping researchers to better understand the function of tattooing in prehistoric times. The existing perception regarding tattooing in the past is that the practice evolved as a medicinal therapy. By mapping these tattoos, specific body regions targeted for preventive, curative, and spiritualistic medicine can be elucidated. Using ethnographic data and the bioarchaeological record of tattooed mummies, this chapter explores the development of corporeal markings that were significant from a medical viewpoint. This chapter also discussess the complex system of tools, techniques, and beliefs by which ancient people attempted to control their health, pain and status in society.





The second oldest tattooed mummy comes from South America, dated between 2563 and 1972 BC. The El Morro man, from Chile, is one of a number of **Chinchorro mummies**, but the only example with tattoos, this time in the form of two lines of dots on his upper lip – resembling a moustache. Stylistically, these tattoos are not too far from Ötzi's, but in this case, it is thought that the tattoos may be a signifier of status or allegiance. Tattoos as signifiers of social status are also seen on the earliest Egyptian tattooed mummies, like Amunet, priestess of Hathor (c. 2134 – 1991 BC, who possesses multiple tattoos on her thighs, abdomen and torso, under her right breast, on the inside of both of her elbows and her left shoulder. A more recent female mummy (c. 1300 – 1070 BC) also has over 30 tattoos, these much more elaborate than any seen before (except perhaps the **Tarim mummies** from China, c. 1800 BC – 100 BC), with lotus blossoms, cows, baboons, and Wadjet eyes across her hips, back, arms and neck. Here again, the mummy is interpreted as a priestess or someone with religious power.



Amunet, priestess of Hathor (c. 2134 – 1991 BC)



The El Morro man (2563 - 1972 BC)





Egypt, Deir El-Madina–Luxor west bank: tattooed mummy  
1300-1070 BC









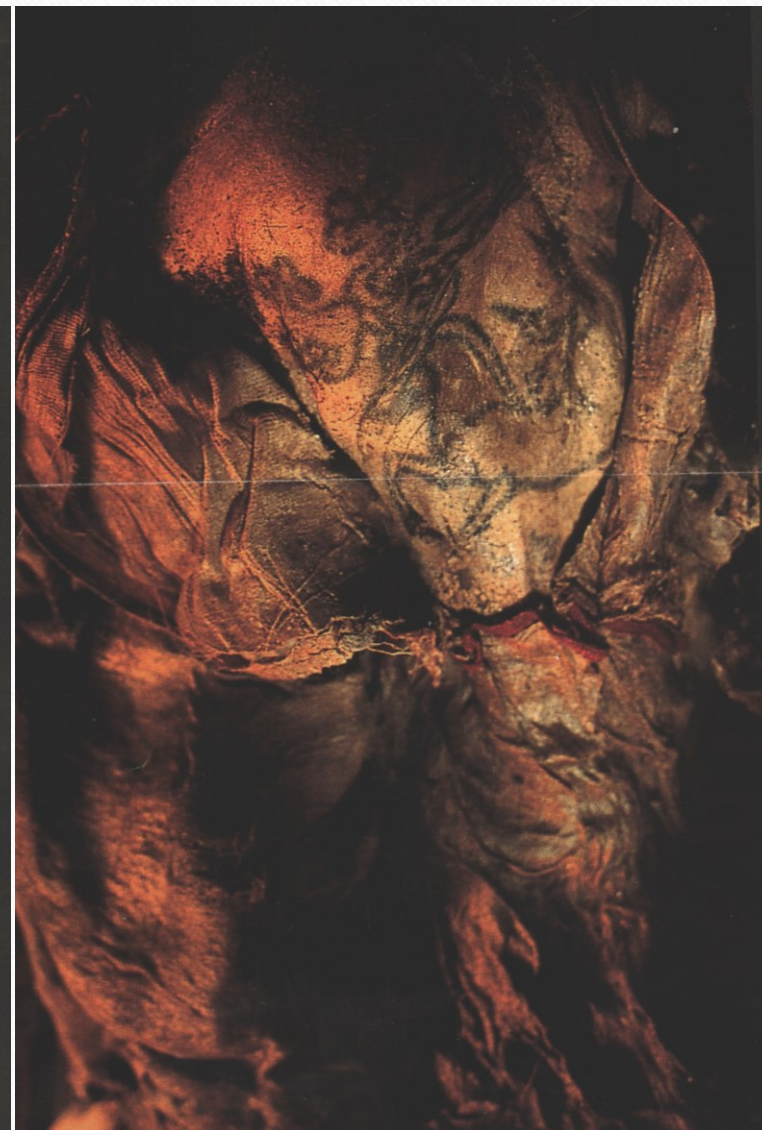
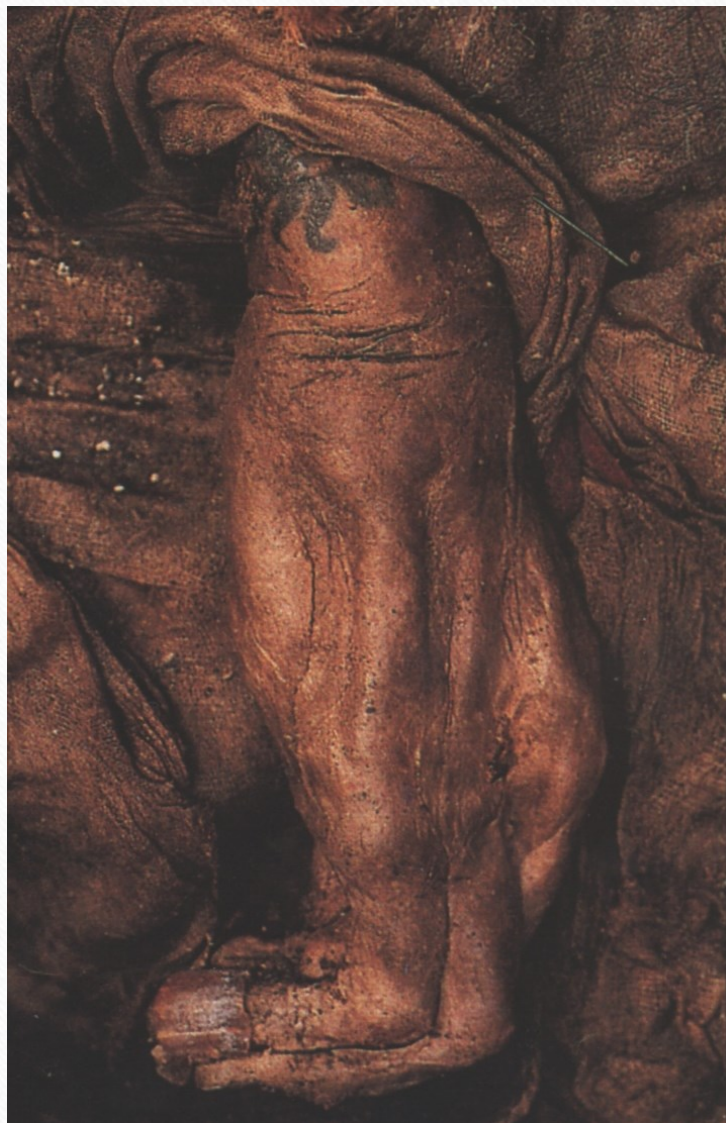
**Jennifer Paszik 2017: AE Ink: Investigating the Mechanics and Meanings of Ancient Egyptian Tattoos, 10.13140/RG.2.2.31223.27042**

Thesis Abstract: This dissertation aims to bring together the evidence of tattooing in ancient Egypt. It then evaluates and contributes to the hypotheses made about the potential meaning of these tattoos. Detailed and educated discussion within this area of research is still relatively new to the field and so all lines of enquiry published so far are explored. An additional aim of this dissertation is to use experimental archaeology and comparative studies in order to obtain a potential answer to the heart that UC 7790 is a set of tattooing implements. Comparing the tools, methods, and inks of other cultures that practice tattooing is a way to offer some guidance regarding the identification of tattooing tools in the archaeological record. The experiment reproduced the original points using the closest modern metal and testing each one with an organic mixture of charcoal and water, and Indian ink as a control ink. The reproduced needles are tested on pigskin and human skin to test efficacy and healing. The results show that the claims regarding the meaning of Egyptian tattoos are insecure and rely on little reliable evidence. The experiment proves that UC 7790 may have been tattoo needles as they successfully tattoo human skin and were probably hafted implements



The tattoos found on the body from Pit 23. Drawing by Ch. K. Wilkinson. (Roehrig 2015, 533)





Siberian Ice Maiden of Ukok



# Face Reconstruction



Man who died in  
Pompei 79 A.D.





Reconstruction of the "Amazon from Ak-Alach" by Marcel Nyffenegger (Flurlingen, Switzerland), 2010  
In cooperation with the Historical Museum Of The Palatinate Speyer and the Technical University Aalen (Germany)





A reconstruction of the Ice Maiden's face was created using her skull, in conjunction with measurements taken from the skulls, facial features, and skin thickness of present-day Altai inhabitants. The artist who created the reconstruction, Tanya Balueva, was documented as saying that the Ice Maiden "is a clear-cut example of the Caucasian race with no typically Mongolian features." Swiss expert Marcel Nyffenegger was asked to recreate a likeness of the supposed female warrior for the Historical Museum of the Palatinate in Speyer, Germany and reached a different, rather Asian look and how the Ukoku Princess really looked like? See the next slide...





THE UKOK ICE MAIDEN  
c. 400 BC





## Tarim Basin Urumchi

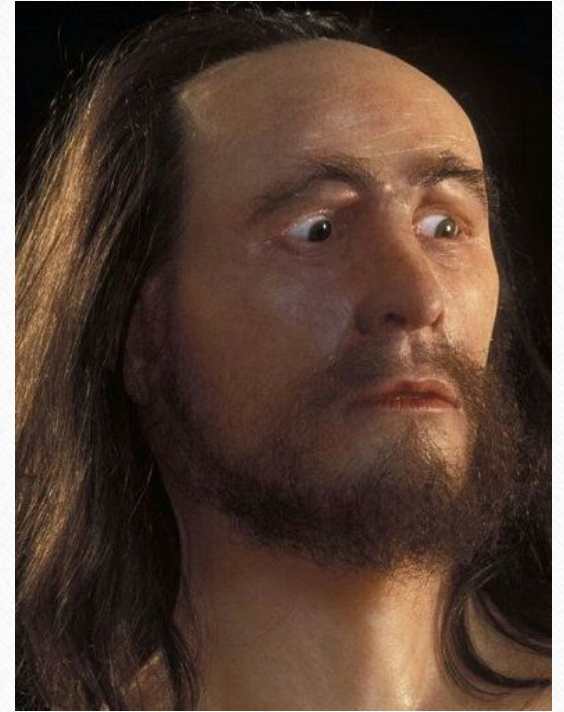
A 2008 study by Jilin University showed that the Yuansha (Urumchi region) population has relatively close relationships with the modern populations of South Central Asia and Indus Valley, as well as with the ancient population of Chawuhu.

In 2007 the Chinese government allowed a National Geographic Society team lead by Spencer Wells to examine the 'Tarim mummies' DNA. Wells was able to extract un-degraded DNA from the internal tissues. The study suggest the Tarim Basin was continually inhabited from 2000 BC to 300 BC and preliminary results indicate the people, rather than having a single origin, originated from Europe, Mesopotamia, Indus Valley and other regions yet to be determined

Between 2009–2015, the remains of 92 individuals found at the Xiaohe Tomb complex were analysed for Y-DNA and mtDNA markers. Genetic analyses of the mummies showed that the maternal lineages of the Xiaohe people originated from both East Asia and West Eurasia, whereas the paternal lineages all originated from West Eurasia. The Indoeuropean look of mummies and their reconstructed faces also suggest the western origin of the Tarim region inhabitants during the Bronze Age.



# Ötzi changing face through time







**Dutch forensic experts Alfons and Adrie Kennis, have created the most successful image of Ötzi in 2011**

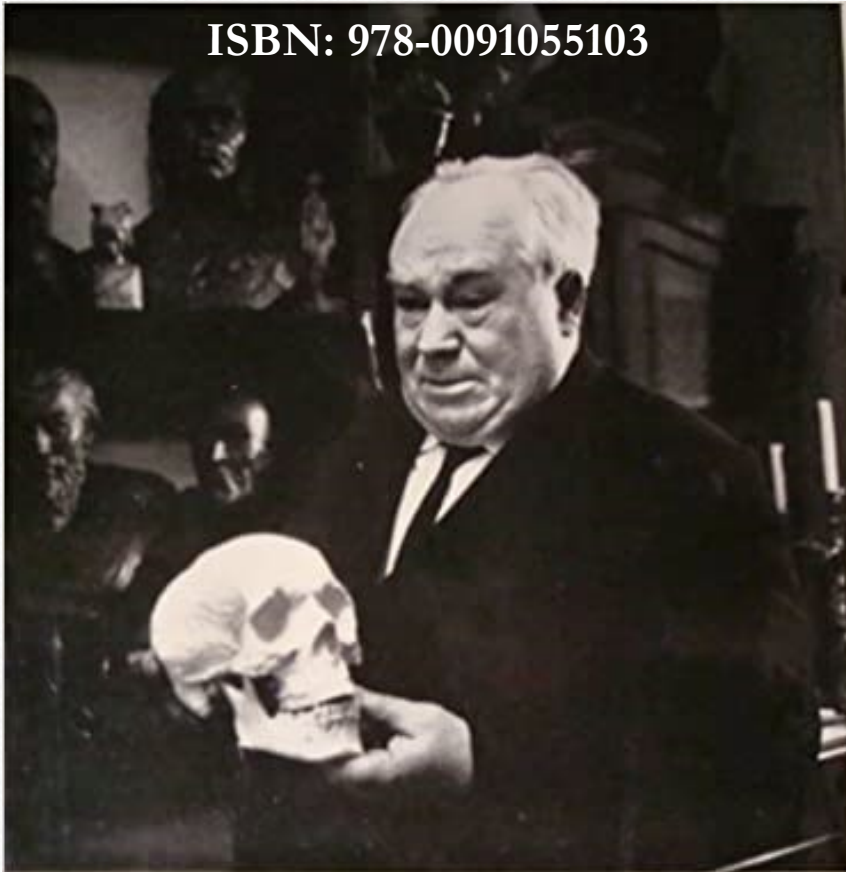
Photo: Heike Engel-21Lux/ South Tyrol Museum of Archeology







ISBN: 978-0091055103



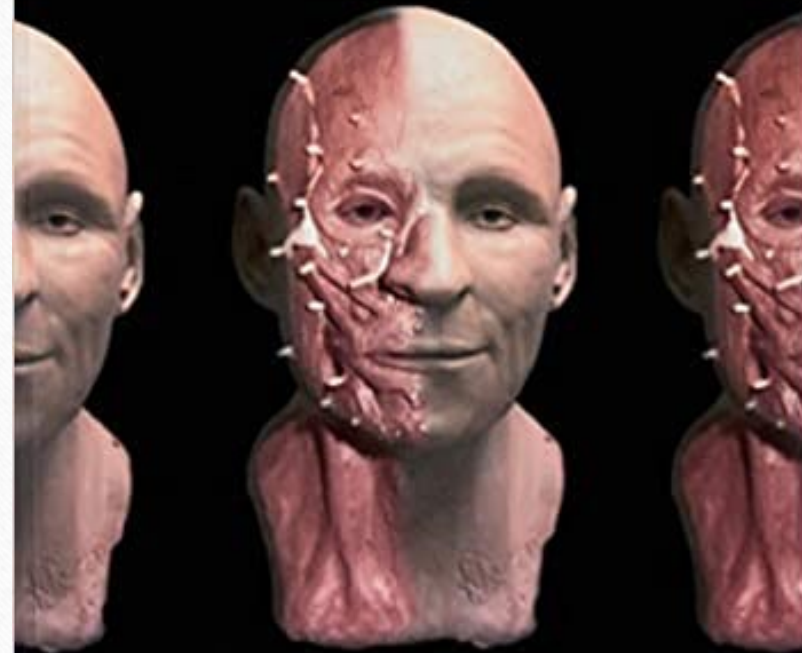
# THE FACE FINDER

M.M. GERASIMOV 1971

## Forensic Facial Reconstruction

Caroline Wilkinson

2008



ISBN: 978-0521090124

CAMBRIDGE



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attention!

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