ICEMAN

"ÖTZI"

3,300 BC

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(Compiled from various sources)

(2014)

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Introduction

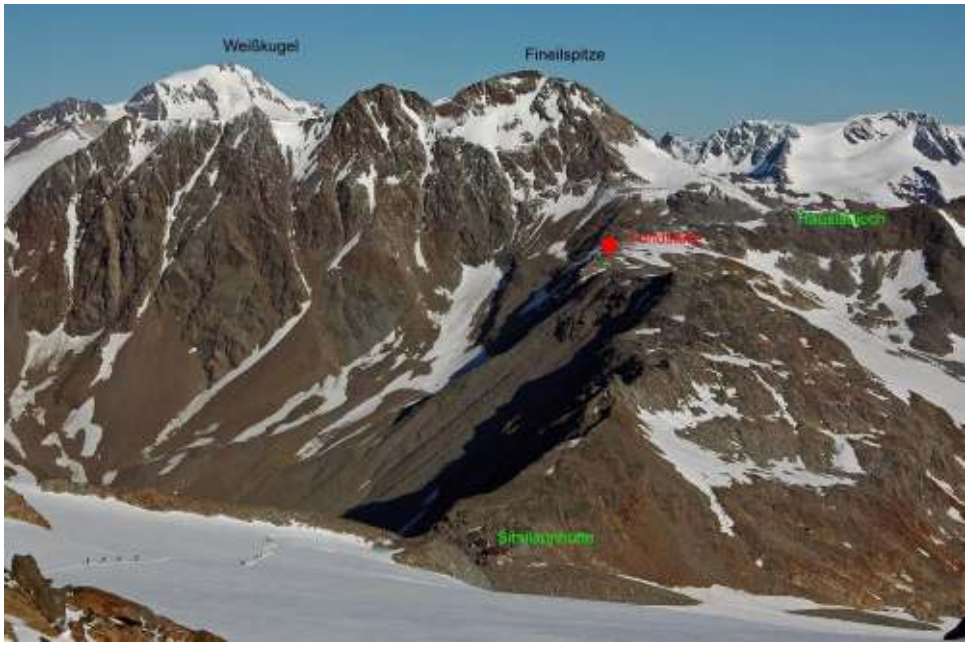
Ötzi; (also known as Ötzi the Iceman, the Similaun Man, the Man from Hauslabjoch, Homo tyrolensis, and the Hauslabjoch mummy) is the natural mummy of a male who lived +/- 3,300 BC.

Ötzi is Europe's oldest known natural human mummy,
and is displayed in the South Tyrol Museum of Archaeology
in Bolzano, South Tyrol, Italy.

On Thursday, 19 September 1991, at +/- 13:30 on a sunny afternoon Erika and Helmut Simon, from Nuremberg in Germany, were enjoying a vacation walk through icy and rock-strewn terrain high up on a mountain overlooking the Ötz valley.

On their descent from a peak near Tisenjoch they departed a little from the usual route hoping to find a finding a short cut. As they crossed an elevated plateau near a mountain glacier at some 10531 feet above sea level, they passed a gully filled with thawing ice and melt-water, and it was here that they discovered a human corpse - Ötzi.

Thus it was that Ötzi was discovered 19 September 1991 in the Ötztal Alps near the Similaun mountain and Hauslabjoch on the Austria/Italy border.



Location of the Discovery
in the Ötztal Alps near the
Similaun mountain

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Physical Details

- **Height** - 1.65 m (5 ft 5 in)
- **Weight** - 50 kg (110 lb; 7.9 st)
- **Born** - c. 3300 BC near the present village of Feldthurns (Velturno), north of Bolzano, Italy
- **Died** - (aged +/- 45); Ötztal Alps near the Similaun mountain and Hauslabjoch on the Austria/Italy border
- **Cause** - Blood loss because of an arrow wound in left shoulder

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Stomach Contents

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 grain as well as roots and fruits. The grain from 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.

Ötzi photographed by Helmut Simon
when 1st discovered, September 1991

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 (a few hours old) at the time of Ötzi's death, which places the event in the spring. Einkorn wheat is harvested in the late summer, and sloes in the autumn; these must have been stored from the previous year.

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.

Ötzi in the glacier

High levels of both copper particles and arsenic were found in Ötzi's hair. This, along with Ötzi's copper axe which is 99.7% pure copper, has led scientists to speculate that Ötzi was involved in copper smelting.

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Tools and equipment

Other items found with the Iceman were a copper axe with a yew handle, a flint-bladed knife with an ash handle, a retoucher/pressure flaker, a quiver of arrows, an unfinished longbow, birch containers, a backpack, a net, and a belt.

Axe

Ötzi's copper axe had a blade that was 3.7 in long, and was secured to a yew handle 24 in long. The blade was attached using birch tar and string, and more than half of the blade was inserted within the handle. The blade was made of almost pure copper and was worked using cold-hammering after casting.

Knife

Another tool was a small flint knife which measured 5.2 in in total length. The handle was made of ash, and the sheath of woven lime wood bast. A string was attached to the back of the knife.

Retoucher/Pressure Flaker

The iceman also had a tool designed for flint knapping. It consisted of a piece of lime tree branch, which was pointed on one side. On the pointed side a hole was drilled, into which a bone plug (stag antler) was inserted with which the knapping was done.

Quiver of Arrows

A quiver of arrows was also discovered alongside Otzi, which was made of leather, and held 14 arrows with viburnum and dogwood shafts. Two of the arrows were completed. They had flint tips, held with birch tar and bindings. The other 12 arrows were unfinished. Also in the quiver was what was presumed to be a bow string, an unidentified tool, and an antler tool which might have been used for sharpening arrow points. There was also an unfinished yew longbow that was 1.82 meters (72 in) long.

Bark Containers

Two birch bark containers were also discovered, possibly used to carry some other items. They were about 5.9 in to 6.0 in in diameter and about 7.8 in in height. They were stitched together using tree fiber. Tests have shown that one of them contained maple leaves as well as spruce needles and charcoal. It is possible that this was a method for carrying an ember from the last camp site.

Backpack

The backpack was very deteriorated at the time of discovery, but it appears to have had a frame consisting of a bent hazel branch about 6.5 ft long, held together by two 15.7 in larch wood pieces at the base. The pack was probably about 3 ft in length.

Net

A net was also discovered, made of tree bast. Such a net was probably used for catching rabbits or birds.

Belt

Otzi had a long belt with a pouch on the side. In the pouch he had several flakes of flint, a 2.8 in long bone awl, and a small drill. The majority of the pouch was filled with tinder fungus. Some traces of iron pyrites were also found, indicating that he was perhaps using a flint and steel method of fire creation.

In addition, among Ötzi's possessions were berries, and two species of polypore mushrooms with leather strings through them. One of these, the birch fungus, is known to have antibacterial properties, and was probably used for medicinal purposes. The other was a type of tinder fungus, included with part of what appeared to be a complex fire-starting kit. The kit featured pieces of over a dozen different plants, in addition to flint and pyrite for creating sparks.

Ötzi's copper axe was of particular interest. The axe's haft is 60 centimeters (24 in) long and made from carefully worked yew with a right-angled crook at the shoulder, leading to the blade. The 9.5 centimetres (3.7 in) long axe head is made of almost pure copper, produced by a combination of casting, cold forging, polishing, and sharpening. It was let into the forked end of the crook and fixed there using birch-tar and tight leather lashing. The blade part of the head extends out of the lashing and shows clear signs of having been used to chop and cut.

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Shoes

When Ötzi was recovered, the right shoe was still on his foot. This consisted of an oval leather sole with turned up edges that were held in place with a leather thong. A woven net of grass was attached on the inside to hold hay in place acting as protection against the cold.

The shoe was closed with a leather upper that was attached to the sole using another leather thong.

The shaft around the ankle was bound with grass filaments to prevent moisture from getting into his shoes. The soles of the shoes were made of brown bear skin. The uppers were make of deerskin and were closed using shoe laces.

Original shoe, with the inner on the right, and the stuffing and part of the outer shoe on the left

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Bearskin Hat

A Bearskin headgear was discovered during the second examination of the site, which was made of the pelt of a brown bear and had two leather thongs attached to the lower rim for the purpose of tying it under the chin.

Ötzi's Bearskin Hat

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Grass Cape

Ötzi's cloak was made of long stalks of Alpine grass and was open at the front. The original length is thought to have been about 90 cm and would have covered the Iceman's entire torso and his thighs. Some Alpine shepherds wore grass and straw cloaks for rain protection into the 20th century.

This is what Ötzi's cape might have looked like

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Tattoos

Ötzi is covered with more than 50 tattoos in the form of lines and crosses made up of small incisions in the skin into which charcoal was rubbed.

Because they are all found on parts of the body that show evidence of a lifetime of wear and tear - e.g. ankles, wrists, knees, Achilles tendon, and lower back, it has been speculated that that the tattoos were therapeutic, rather than decorative or symbolic.

Above - The Tattoos

When Ötzi was first discovered, archaeologists were very excited because they had never before seen Copper Age tattoos, and because acupuncture as a treatment for joint distress, rheumatism, and arthritis was thought to have originated in Asia more than 2,000 years later.

Radiological examination of his bones showed "age-conditioned or strain-induced degeneration" in these areas, including osteochondrosis and slight spondylosis in the lumbar spine and wear-and-tear degeneration in the knee and especially the ankle joints.

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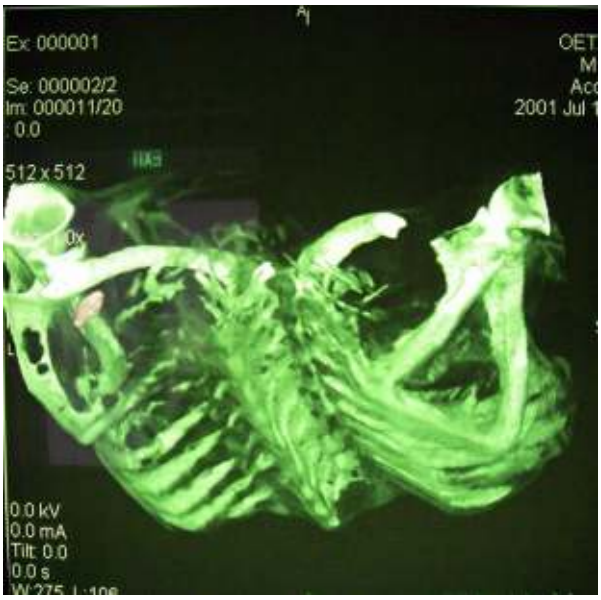
Cause of death

Cause of death was from blood loss from an arrow wound in shoulder, which was estimated to have been inflicted some 8 hours prior to death.



Otzi's chest with the arrow head depicted in a different colour on the left

Arrowhead in Shoulder

Speculation involving struggle followed by cold death

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.

However, 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 speculated that death was caused by a blow to the head, though researchers are unsure if this was because of a fall, or from being struck with a hard object (e.g. rock) by another person.

Skull Trauma

Unpublished and thus unconfirmed DNA analyses claim traces of blood from four other people on Ötzi's gear: one from his knife, two from the same 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 unnatural posture in death (frozen body, face down, left arm bent across the chest) suggests that the theory of a solitary death from blood loss, hunger, cold and weakness is incorrect. Rather, before death occurred and rigor mortis set in, the Iceman was turned on to his stomach in an effort to remove the arrow shaft.

In May 2012, researchers using Raman spectroscopy and atomic force microscopy concluded that Ötzi did not die immediately from his shoulder wound. They detected dried blood cells and possibly fibrin in a state of degradation from maturity, suggesting an established blood clot of a few days' old.

The DNA evidence suggests that he was assisted by companions who were also wounded; pollen and food analysis suggests that he was out of his home territory. The copper axe could not have been made by him alone. It would have required a group tribal effort to mine, smelt and cast the copper axe head. This may indicate that Ötzi was part of an armed raiding party involved in a skirmish, perhaps with a neighbouring tribe, and this skirmish had not gone well.

When the Iceman's mitochondrial DNA was analyzed by Franco Rollo and his colleagues, it was discovered that he had genetic markers associated with reduced fertility,

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Blood

In May 2012, scientists announced the discovery that Ötzi still had intact blood cells. These are the oldest blood cells ever identified.

In most bodies this old, the blood cells are either shrunken or mere remnants, but Ötzi's have the same dimensions as living red blood cells and resembled a modern-day sample.

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NATIONAL GEOGRAPHIC DAILY NEWS

5 SURPRISING FACTS

ABOUT OTZI THE ICEMAN

(Adapted)

http://news.nationalgeographic.com/news/2013/10/131016-otzi-ice-man-mummy-five-facts/#close-modal

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Scholars continue to be amazed by the ancient man found frozen in the Alps

A report that Ötzi the Iceman has 19 genetic relatives living in Austria is the latest in a string of surprising discoveries surrounding the famed ice mummy. Ötzi's 5,300-year-old corpse turned up on the mountain border between Austria and Italy in 1991. Here is a rundown of the latest on the world's oldest Alpine celebrity, and some of the other remarkable things we've learned about Ötzi.

1. The Iceman has living relatives.

Living links to the Iceman have now been revealed by a new DNA study. Gene researchers looking at unusual markers on the Iceman's male sex chromosome report that they have uncovered at least 19 genetic relatives of Ötzi in Austria's Tyrol region.

The match was made from samples of 3,700 anonymous blood donors in a study led by Walther Parson at Innsbruck Medical University. Sharing a rare mutation known as G-L91, "the Iceman and those 19 share a common ancestor, who may have lived 10,000 to 12,000 years ago," Parson said.

The finding supports previous research suggesting that Ötzi and his ancestors were of farming stock. The study used Y-chromosome markers that are passed from father to son to trace the Neolithic migrations that brought farming to Europe via the Alps. Ötzi belonged to a Y-chromosome group called haplogroup G, which is rooted, like farming, in the Middle East.

The study's overall results fit the idea that the changes of the Neolithic Revolution spurred people westward into the Tyrol region, Parson said.

He is nevertheless wary of any suggestion that Ötzi's distant relatives might be a chip off the old block, either physically or in their liking for simple grain porridge.

2. He had several health issues.

Since Ötzi's discovery in an alpine glacier more than two decades ago, scientists have subjected his mummy to a full-body health check. The findings don't make pretty reading. The 40-something's list of complaints include worn joints, hardened arteries, gallstones, and a nasty growth on his little toe (perhaps caused by frostbite).

Furthermore, the Iceman's gut contained the eggs of parasitic worms, he likely had Lyme disease, and he had alarming levels of arsenic in his system (probably due to working with metal ores and copper extraction). Ötzi was also in need of a dentist - an in-depth dental examination found evidence of advanced gum disease and tooth decay. (See video: "Iceman Autopsy.")

Despite all this, and a fresh arrow wound to his shoulder, it was a sudden blow to the head that proved fatal to Ötzi.

3. He also had anatomical abnormalities.

Besides his physical ailments, the Iceman had several anatomical abnormalities. He lacked both wisdom teeth and a 12th pair of ribs. The mountain man also sported a caddish gap between his two

front teeth, known as a diastema. Whether this impressed the ladies is a moot point - some researchers suggest that Ötzi might have been infertile.

4. The Iceman was inked.

Ötzi's frozen mummy preserves a fine collection of Copper Age tattoos. Numbering over 50 in total, they cover him from head to foot. These weren't produced using a needle, but by making fine cuts in the skin and then rubbing in charcoal. The result was a series of lines and crosses mostly located on parts of the body that are prone to injury or pain, such as the joints and along the back. This has led some researchers to believe that the tattoos marked acupuncture points.

If so, Ötzi must have needed a lot of treatment, which, given his age and ailments, isn't so surprising. The oldest evidence for acupuncture, Ötzi's tattoos suggest that the practice was around at least 2,000 years earlier than previously thought.

5. He consumed pollen and goats.

The Iceman's final meals have served up a feast of information to scholars. His stomach contained 30 different types of pollen. Analysis of that pollen shows that Ötzi died in spring or early summer, and it has even enabled researchers to trace his movements through different mountain elevations just before he died. His partially digested last meal suggests he ate two hours before his grisly end. It included grains and meat from an ibex, a species of nimble-footed wild goat.

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