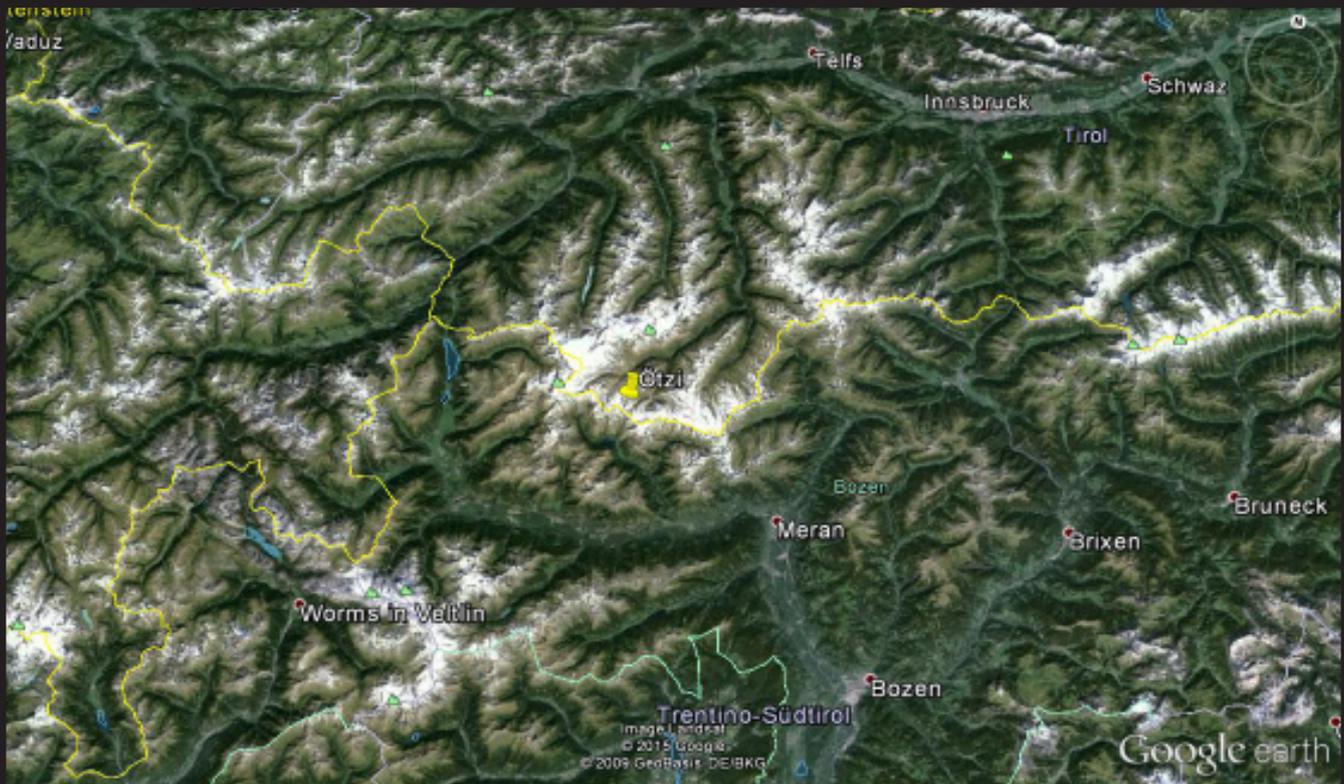


# “Ötzi” The Ice Man

Sensational  
Discovery  
in the Alps





**Introduction**

You might have heard about the sensational discovery about 25 years ago of the so-called “Ice Man” found by hikers in the Austrian Alps. At first it was believed to be the frozen body of a missing mountain climber.

But the antique looking copper axe found next to him raised doubts. Unfortunately the dead body plus other remains were hacked rather unprofessionally out of the surrounding ice. But after having been taken to forensic pathologists, it became immediately clear, that this discovery was not a body of a dead alpine hiker, but much older possibly from the Bronze Age.

**Icy Facts**

The news around the “Ice Man” created a real press hype of weird stories and plenty of freewheeling theories about his provenance and death. But let’s stick with the facts.

The completely dehydrated and mummified body was found off the normal hiking track at an altitude of 3,210 meters in a shallow dip at Tisen Neck just below Finail Peak in the Ötztal Alps.

The Similaun hut on Austrian territory is only an hour’s hike away. And from there a hasty recovery process was set into motion. Therefore the body ended up in Innsbruck Austria and the first research was done there. But finally it was established, that the “Ice Man” was found 92 meters from the border on Italian territory. So today the still frozen body is now exposed at its own museum in Bolzano in northern Italy.

You can imagine that this is a very special find, because this mummified body was so well preserved by ice. In addition the “Ice Man” was found with all his clothing and a long list of prehistoric equipment.



After 25 years research is still going on and regularly new revelations astonish experts. Imagine about thirty research applications from a multitude of specialists from around the world are received per annum.

**Real Sensation**

Besides his perfect condition, his various weapons plus tools made the “Ice Man” a sensational discovery. There are only

few Neolithic mummies, such as the Lindow Man found in England, or the Tollund Man in Denmark. In addition this was the first archaeological excavation in glacial ice conditions above 3,000 meters. But this discovery is also the oldest, because "Ötzi", as he is also called, lived 5,300 years ago in the southern alpine valleys. Recent DNA tests show, that he came from the Lake Garda area, but had ancestors also from the Mediterranean islands of Sardinia and Corsica.

### Historical Context

To enable you to better understand this sensational discovery and all the details about his clothes, tools and way of living, here are some historical facts. In Egypt for example it was the end of the Gerzan or Naqada Culture and the start of the Pre-Dynastic Period with the very first mentioned ruler "Pen-abu" meaning the elephant. This is really the start of the Egyptian civilization becoming so highly advanced later on.

But we also have to remember that 30,000 years earlier the first art objects and musical instruments were made from mammoth ivory during the Aurignacian Period in southern Germany. And in France the highly realistic and artistically beautiful cave paintings were created at Chauvet. The very first permanent settlements with farming and animal domestication took place in the Fertile Crescent in the Near East about 10,000 years before his time. And this so-called "Neolithic Revolution" moved slowly to Europe. So "Ötzi" lived in an environment with permanent settlements, well developed farming and animal husbandry.

### Climatic Conditions

Experts established that the "Ice Man" died in spring, when snow was still falling and covered the alpine pass he crossed. His body was covered only by a thin layer of snow at the time of his death. So the extreme sun at this altitude plus the typical alpine dryness could dehydrate and mummify his body quickly. In the following winters his body was then covered by more and more snow and remained in glacier conditions for thousands of years. It is assumed that up to twenty meters of snow and ice covered his body for some time. Only the recent global warming and climb in temperatures melted the ice pack down and gave him free.

### The Ice Man

Let's talk about "Ötzi" first before we look at his clothes, weapons and tools. He was about 1.6 meters tall and his weight was approximately fifty kilos. And he was about 45 years old when he died.



*experts think neolithic hunter and herders looked and were equipped like this*



*example of a neolithic individuals clothing the climate was much colder than today*

Which is relatively old for a Neolithic man living at that time and can be compared to 75 years in today's terms. Interesting other facts are his European shoe size being 38 and he had brown eyes and curled long brown hair plus a sizeable beard.

### Medical Condition

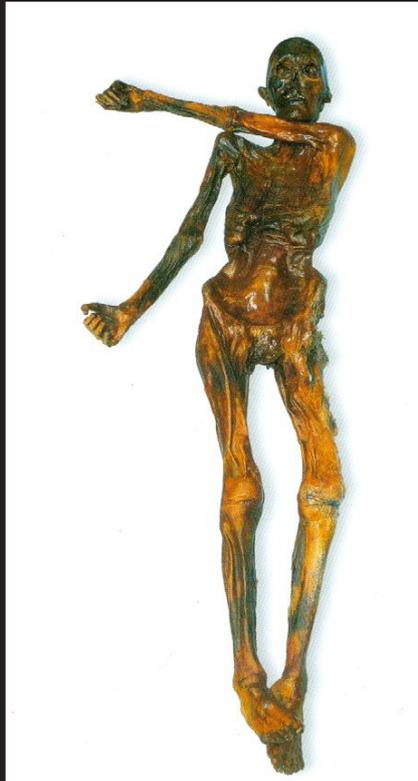
Nevertheless for his old age he was very fit and had no fatty body tissue at all. But age degeneration signs were obvious including worn joints and his arteries were covered with the typical calcium layer, which comes normally with age. Actually he suffered from arthritis, heart disease and had also borreliosis. In addition he was lactose intolerant, which at the time was a normal condition.

His worn and degraded teeth show that he ate lots of corn mixed with fine sand resulting from the stone milling process. He had also problems with caries and specific teeth marks indicate, that he used his teeth also as a tool for certain tasks.

His blackened lungs tell another story. He must have inhaled a lot of smoke from open fire places in closed huts and possibly he spent time close to ore and copper smelting too.

### Anomalies Found

Fascinating are certain anomalies experts discovered. For example he was missing his twelfth rib bow, but this did not hinder him at all in his daily tasks. Visible was his diastema a four millimeter wide space between his front teeth, which still can be seen with some individuals today. He also had



no wisdom teeth, which might be explained with evolutionary reasons.

### Many Tattoos

At first archaeologists were puzzled by the over fifty tattoos found on his entire body. They are situated on his back, lower leg, foot and knee in groups of short lines plus some crosses. But paleo-pathologists had a



fitting explanation. In these small cuts charcoal was rubbed in to create a medical reaction. In all these places his bones show degeneration and must have hurt. These cuts were actually used for healing purposes.

What is surprising, that all these cuts are situated exactly where acupuncture needles are set today. Was this possibly proof of the first acupuncture treatment 2,000 years before the first usage became known in Asia?

### Reasons for his Death?

As already mentioned there were for years numerous theories doing the rounds in the international press about his death. Only in 2001 years after his detection a small stone arrow head still stuck in his back below his left shoulder was discovered during renewed scanning.

The entry wound was only two centimeters wide and due to the extreme dehydration and mummification was overlooked. Imagine his body is today only weighing thirteen kilos.

Despite the fact that the arrow head missed his lung only by fifteen millimeters, it nevertheless damaged an important nerve bundle. So his left arm was paralyzed and he died within minutes through strong bleeding because it hit the important *arteria subclavia*.

The arrow must have hit him from a distance, because it entered not too deep in his body, but nevertheless the rapid and intense bleeding killed him rather quickly. He also received a hit

on his head, which is indicated by skull fractures and a brain haematoma. But this could also have happened through a fall on the steep and rocky slopes he climbed up to the pass.

### Various Theories

I want to mention only a few of the most suitable theories about his death. Was he killed to be robbed? Possibly not, because the equipment he was found carrying, seems to be complete. His copper axe for example was a valuable tool, but was not taken. This axe also indicates, that he was an elite member of his clan.

But then was he herding and killed in the process of animal theft? Yes one of the most valuable belongings of a clan were their herds, in his case goats and sheep. So was he robbed of that and injured in the battle and left behind. We know that at the time it was the task of elite clan members and trained warriors to herd animals away from settlements in the mountains.

Another theory was investigated too. Was he a ritual burial to appease gods? We know that human sacrifice was practiced, but also in this region? Some circumstances might suggest a ritual burial. There are various items found, which point into this direction. For example his unfinished new bow, and the various lengths of his arrows, produced by different persons. Were they assembled as burial gifts as it was customary at the time?

### Other Injuries

The "Ice Man" must have been involved in a serious fight a few days before his death. He received a deep cut on his right hand, which must result from defending himself against a

knife attack. Indications are, that he was exposed weeks and months before to various aggressions. Examinations of his finger nails show, that he suffered high stress levels about five and again four and finally two months before his death.

This suggests, that he or his clan were repeatedly attacked and he might have been the only male member of his clan left and fled. Various old injuries like serial rib fractures and a broken nose confirm possible aggression between clans or



new groups moving into his territory.

### Ice Man Clothing

The clothes found show, that at the time our ancestors were exposed to a harsher climate. His full set of clothing included cap, upper body coverage, leggings, belt, loin cloth, shoes and a grass mat.

All pieces were made of tanned leather and fur using cow or deer sinew and tree bark strips to needle them together. All his clothing show heavy wear and tear plus various repairs possibly executed when

necessary on the way. His coat was made from long goat leather pieces fit together with regular stitches. The use of alternative stripes of dark and light leather is interesting. Was it a sign of status or early Neolithic fashion design?

His leggings were also made from goat leather and were attached at the feet with deer leather stripes to his shoes. At the top the leggings were bound with stripes to his belt. The five centimeter wide and two meter long belt was made of cow leather. It was wound twice around his waist and then knotted together.

A small belt pouch was sewn to the belt and contained various small tools, including a sharp flint scraper, flint drill, flint stone piece, bone awl and tinder sponge. This sponge was used to make fire. This was done with pyrite and flint stones. The tinder sponge with a few drops of urine caused a chemical process and lit up easily by the sparks.

His loin cloth was about one meter long and made from goat leather and worn between the legs and held by his belt. The front part also covered his belt pouch with the small tools and tinder sponge against rain.

His shoes were special too and had a double lining. The inner shoe was made out of a hay insulation and held together by a woven net of strings fixed to the sole. The outer shoe was made from deer leather and also fixed to the oval shaped sole. Woven and twisted straps around the shoes and soles gave enough grip to the sole to safely walk over rocky mountain slopes.

### Ancient Copper Axe

A most fascinating list include

various weapons and tools the "Ice Man" carried with him. These made him rather self sufficient. A copper axe is the most precious item of any clan member during the Neolithic Period.

It was used as weapon and tool for various purposes. Possibly "Ötzi" did fell the small yew tree with it from which he then cut his new bow. This is also the oldest fully intact copper axe example worldwide. The copper head is ten centimeters long and has 99% copper content with minimal traces of silver and arsenic. It was sharpened by hammering technique.

The handle is sixty centimeters long and birch tree tar resin plus leather strips were used to fix the heavy copper piece to the wooden handle. A copper axe is a clear sign of being an elite clan member. But possibly he was an important warrior or even clan chief.

### Flint Knife

When found he still held his thirteen centimeter long flint stone knife in his hand. Interesting though the sharp flint blade comes from a deposit at Monti Lessini east of Lake Garda. The handle was made of ash tree and the knife's sheath was fixed to his belt.



*picture of the mountain pass he climbed he died a few meters behind this ridge today marked with a stone pillar*

It is remarkable that his various pieces of equipment were made from so many different kinds of wood, each with the best quality for the specific needs. Maximum elasticity for the bow, best strength for the axe handle and stability and lightness for the arrows.

### Quiver & Arrows

His leather quiver bag was nearly a meter long and had a rectangular form, which was stabilized by a hazel branch on one side. It contained twelve unfinished arrows, plus two finished ones ready to use.

In the quiver also four sharp antler end pieces plus a two meter long rope and animal sinew was discovered. This needs to be seen in context with the unfinished bow and arrows. Two usable

arrows were equipped with flint heads and bird feathers at the end. But surprisingly they were of different lengths and one even too long for closing the quiver flap top. When examining the feathers on the shaft, it was found that the arrows were produced by two

different men, one left and the other right handed.

What does that tell us? Was "Ötzi" involved in serious fighting and used all his arrows? Did he collected the arrows shot at him but missed? But what did happen to his most important weapon and hunting equipment his bow?

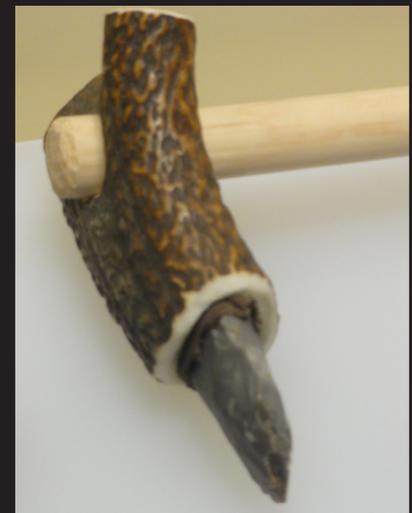
### Unfinished Bow?

His new wooden bow leaning against a rock next to him was still unfinished and had no string. This raw bow was 1.8 meter long and made from yew tree. This bow was recently rebuilt and tested to establish its precise capacities.

The tests have shown, that animals could be killed with precision shots from thirty to fifty meters with arrows fully penetrating the animal's body. And it also showed that maximum distance shots could

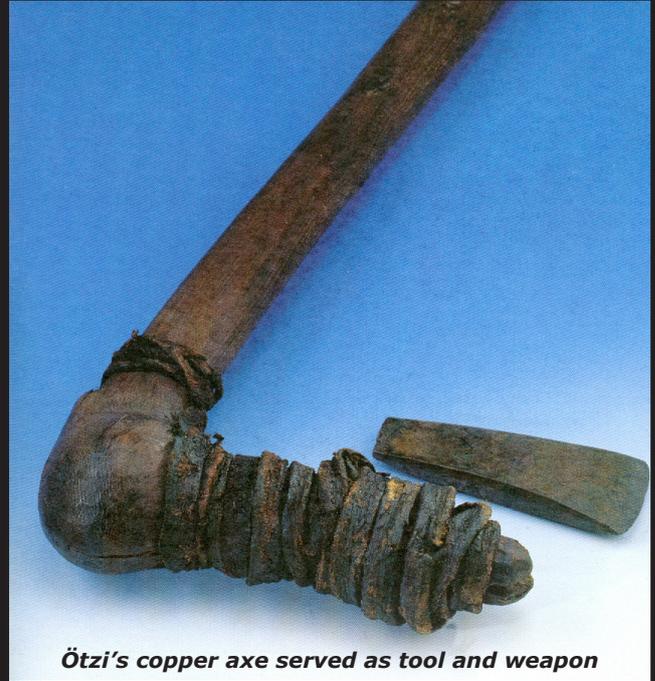


*replicas of some neolithic axes & below arrow head examples*





*flint stone knife Ötzi was still holding in his hand*



*Ötzi's copper axe served as tool and weapon*

reach up to 180 meters. So his type of bow was an excellent hunting and defense weapon.

The bow and arrow story is alarming, because the "Ice Man" could not really defend himself with this insufficient pieces of equipment. He must have been chased and therefore trying to flee up the mountain pass to escape. Nevertheless he started and tried to refurbish his arsenal of arrows and work on a new bow.

### Other Equipment

It is amazing what Neolithic travelers took on trips. His back pack is one of these multiple use pieces of equipment. It was

made from a "U" bent hazel tree stick with two wooden plates at the back and was possibly fitted with a large leather carry bag.

### Unique Retouch Tool

For a long time experts could not make out what purpose a peculiar pencil shaped tool had, because no similar piece of equipment was ever found before. But over time it became clear, this was a unique flint stone retouch and sharpener tool. The twelve centimeter long handle was made from lime tree. A fire hardened deer antler piece was inserted in the center, so it could be used to produce the cutting edges of flint blades by applying the necessary pressure.

### Fire Box?

He also carried with him a midsized round birch bark box. This he used for transporting glowing charcoal in insulating leaves. The embers kept glowing for some hours and this helped to light a fire rapidly when needed.

### Medication

Another thought-provoking item he carried, were the two pieces of tree sponges. He used these for medical treatments for example to stop his bleeding hand palm or as antiseptic against possible infections. So medicine was not unknown to our ancestors 5,000 years ago. The list they used at the time was long and included many herbs and saps.



*flint stone scraper to cut meat plus arrow & spear heads*



## Stomach Content

How do you examine the stomach content of a 5,000 year old fully dehydrated mummy? Just consider that the "Ice Man" is actually older than the oldest known Egyptian mummies.

Surprisingly only in 2009 his stomach was discovered. It was previously believed not to exist any longer and therefore overseen. For what ever reason it was pushed up into his upper body next to his lungs.

Just towards the end of 2015 experts published another new research result. A rather aggressive version of the stomach bacteria *helicobacter pylori* was found not in his gastric mucous membrane, which did not exist any longer, but in his stomach content. In this aggressive form it is responsible for ulcers and even stomach cancer. But certainly "Ötzi" must have had regular stomach pain.

This stomach bacteria is known to have troubled humans for 100,000 years and today half of the world population has it in a mild form. But this aggressive version is today only found in Mid and South Asian population. This opens up a total new discussion about his prehistoric descent and origin.

The latest results from DNA analysis show that his mother belonged to a small alpine tribe, which has died out. But his father's tribe has wide spread origins all across Europe. Surprisingly 19 males alone in Tyrolia are related with Ötzi.

## What did he eat?

Newly developed research

techniques showed, that he moved around a lot in his last days and spent time in the Vinschgau Valley about twelve hours before his death. They could also prove that he had a meal there made of einkorn, meat and vegetables cooked on open fire.

## Moss on the Menu?

But what can we make out of the fact, that in his digestive system six different types of moss were found? Why did he eat these? They had no nutritional value at all. Recent research went further and offered interesting new results.

## Rather varied Meal

The above indicates that he had another meal about an hour before his death. This contained for example corn, ibex or billy goat meat possibly dried, an apple and a very fatty substance still not defined. Why did he consume this before he made his strenuous trip up the mountain pass?



What is astonishing, fatty food was not really on the Neolithic menu at the time. So he must have eaten it for a purpose, similar to the moss. Possibly to give him the needed strength and energy to overcome the expected cold temperatures and long march ahead of him.

## But who was he?

Certainly he was a high ranking member of his clan. This is proven by the prestigious weapons he was carrying. He certainly was a clan elder and definitely a well trained warrior and excellent hunter as well as a herder of his clans most important possessing, a flock of sheep or goats.

## Was he a Shaman?

We know that at the time shamans lived alone and away from their tribe. They also climbed mountains for certain rituals. But we can assume he was not a shaman, because he did not carry any shamanic utensils with him. So that possibility is out of the question.

## Was he a prospector?

What does a single man do in the mountains? Was he searching for valuable copper ore deposits necessary to produce important arms? We can also drop the idea that he was on an ore prospecting tour high up in the mountains, because he had no samples nor necessary equipment for this job with him.

## Was he a trader?

Assumptions are he was also not on a trading mission, because no trading items were found with him.

## Flight of his Life!

As we have seen above, all indications are, that most certainly he was fleeing from great danger. But he was still hit from a long distance by an arrow in his back just before he reached the mountain pass. Heavily bleeding possibly he lost his consciousness and collapsed and died quickly in a small dip. Here off the normal hiking track he was found by accident in 1991 after 5,300 years.