Ötzi the Iceman: Stone Age Crime Scene

Five thousand years ago, a man died on a mountaintop, and a mystery was born. Entombed in ice and snow, his remains lay preserved for millennia until 1991. Scientific study of his body has yielded numerous discoveries, but questions about the manner of his death still linger.

September 1991 turned out to be hotter than normal in the Austrian Alps. Helmut and Erika Simon, a German couple with years of mountaineering experience, were just starting a perilous descent on the Ötztal Alps on the Austro-Italian border. The Simons had made it to the summit, an altitude of more than 11,500 feet, and decided to come down using a challenging, alternative route.

After descending through plunging gorges and rocky overhangs, they found themselves looking over a narrow ravine, flooded with meltwater from the glaciers. On their way down, they suddenly spotted a brown object protruding from the slushy ice. Helmut thought it looked a little like a doll,

but on drawing closer, the couple found themselves looking at the head and shoulders of a corpse.

Beside the dead body were a few objects: some kind of case, apparently made from bark, and a little farther away lay what appeared to be a blue ski binding. Helmut and Erika assumed that the body must have been a skier who died in an accident years before. The couple completed their descent, returned to their hostel, and reported their findings to the owner, who contacted the Italian and Austrian police.

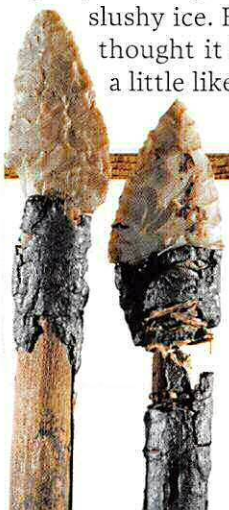
Recovering the Body

The following day, officials flew in a helicopter to the Alpine site but were unable to extract the body, For three days, they worked using picks, ski poles, and even a pneumatic drill (one of the officers accidentally damaged the left hip and thigh of the body and its clothing), but the ice would not yield.

As the police continued their efforts, they noticed near the body a strange assortment of objects that didn't appear to belong to a modern-day skier: pieces of leather, string, and clumps of hay. After finally freeing the frozen remains, they all recognized they had a mystery on their hands. Who was this man?

FOLLOWING A FAILED ATTEMPT, Ötzi is finally freed from the ice. A tool used in the earlier efforts had damaged the body, especially the left hip.

Reinhold Messner, an experienced Italian mountaineer who had climbed up to see the body, observed certain details at the scene that



TWO ARROWS WITH FLINT HEADS DISCOVERED IN THE QUIVER CARRIED BY ÖTZI. SOUTH TYROL MUSEUM OF ARCHAEOLOGY, BOLZANO, ITALY
ROBERT CLARK

1991
Two German mountaineers come across Ötzi's body during a hike in the Alps near the Austria-Italy border.

2001
Radiologist Paul Gostner discovers an arrowhead lodged in Ötzi's shoulder blade, suggesting a violent death.

2010
An autopsy reveals Ötzi died from a blow to the head delivered shortly after he ate a last meal of alpine ibex, a wild goat.

2015
Using nanotechnology, a new analysis of Ötzi reveals traces of the oldest human red blood cells ever detected.

SYGMA/CORDON PRESS

piqued his curiosity. The body looked strange to him: The skin was leathery and tough. Messner raised the intriguing possibility that this was no recent accident and that the body could have been there for hundreds or perhaps thousands of years. Whatever its exact age, he felt certain that they were dealing with an important archaeological discovery—a case to be solved by archaeologists rather than the police.

Gathering Clues

The rumors surrounding the mysterious body soon reached Konrad Spindler, director of the Institute of Prehistoric Alpine Research at the University of Innsbruck. Once the body was freed from the ice, he went to Innsbruck's Institute of Forensic Medicine to see it,

ÖTZI'S LIFE: NASTY, BRUTISH, AND SHORT

WHEN HE DIED, ÖTZI suffered from a wide range of health problems, even though he was estimated to be 45 years old. Scientists found problems typically seen in much older people today: worn joints, hardened arteries, gallstones, and tooth decay.

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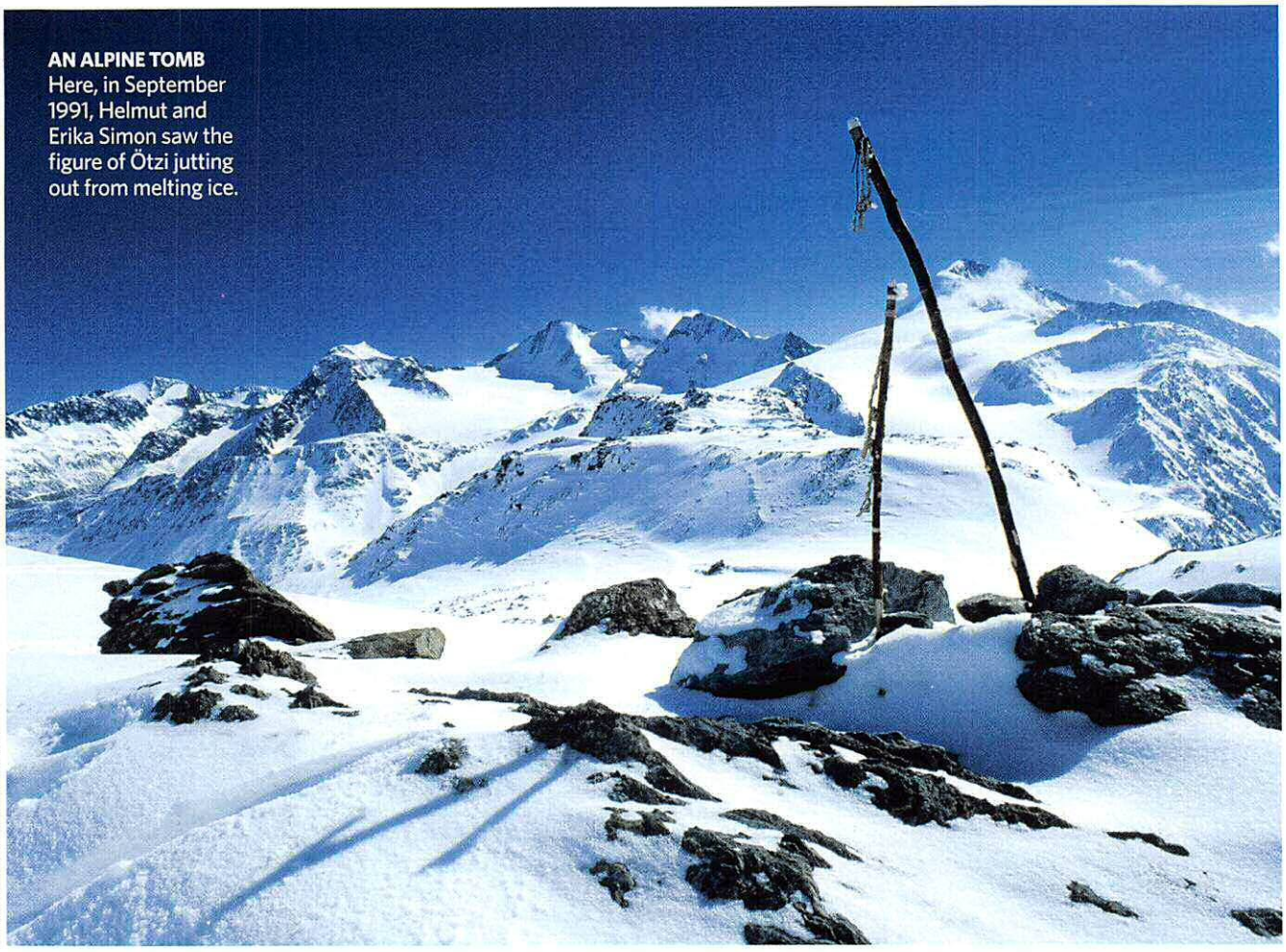
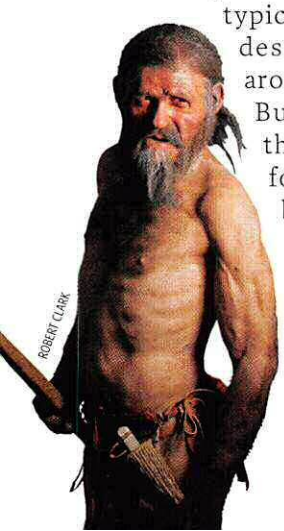


AN ALPINE TOMB
Here, in September 1991, Helmut and Erika Simon saw the figure of Ötzi jutting out from melting ice.

GERHARD ZWERGER-SCHONER/AGE FOTOSTOCK

along with the collection of tools found strewn around. Among the recovered items were a quiver with arrows, a leather hat, a copper ax, and a birchbark pouch container with embers to make fire.

These objects intrigued Spindler, especially the ax. Spindler noted it was a typical Bronze Age design dating to around 2000 B.C. But the rest of the possessions found with the body were cruder, suggesting the man may have lived in an even earlier period than initially thought.



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RECONSTRUCTION OF ÖTZI. ALFONS AND ADRIE KENNIS

To answer the question of when he lived, scientists turned to carbon-14 dating. Two separate laboratories, one in Zurich, Switzerland, and the other in Oxford, England, assessed the body's bones and tissues. Both labs confirmed an astonishingly early date: 3000-3200 B.C.

Identifying the Body

Named for the Ötztal Alpine range, which had been his tomb for 5,000 years, Ötzi's body became the subject of intense scientific study. But more questions arose than answers. Who was the Iceman, how did he live, and how did he die?

Analysis of the tools that Ötzi had been carrying when he died led Spindler to be fairly certain that Ötzi had lived somewhere in the Venosta Valley, a day's walk from where he was found. Certain objects discovered in tombs in the region, such as stone axes, had been dated to the same time period as Ötzi. Flints and copper axes of a similar design had also been found near Merano, just over the Italian border.

Another clue to Ötzi's identity came from studies in the field of paleobotany. Caught in the iceman's clothes were fragments of a primitive variety of wheat that had been cultivated in the valleys surrounding the Ötztal mountains. In addition, the place where Ötzi's corpse was found lay on an ancient path used by herdsmen to move their livestock to high summer pasture and back down for the winter months. The researchers concluded that Ötzi must have belonged to an agricultural and herding community based in the valley.

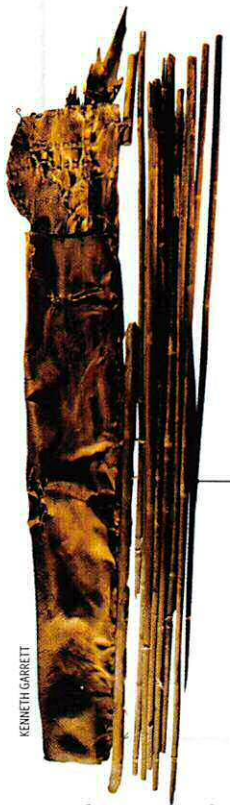
But all these results gave rise to another tantalizing question: If Ötzi had indeed been an experienced herdsman, what could have caused his death in a place he must have known so well?

Murder Most Foul

A series of x-rays were carried out and incisions

The Iceman Cometh Prepared

ÖTZI'S TOOLS AND CLOTHING show he was well prepared for mountain life. He was wearing warm clothes: a hat, a cape made of plant fibers, socks made of cord, and shoes made of hay and hide. He carried weapons and firemaking tools.


KENNETH GARRETT


ROBERT CLARK

His hat is made of patches of leather sewn together, with two strips for fastening under the chin.

The quiver, made of animal skin, contained 12 arrow shafts. Its cord is lost, and the support is broken.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Both Ötzi's shoes were recovered, the right better preserved than the left. It was still on Ötzi's foot when he was found.


BRIDGEMAN/ACI

Birchbark containers were found near Ötzi's body. One contained embers for making fire.


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The copper ax had been repaired by Ötzi, who attached the axhead to the handle with glue made from birch bark.

made into the thorax. These tests revealed four broken ribs on the right side that had not had time to heal. Ötzi must have sustained the injury shortly before death. A cut on his right hand had started to form scar tissue. Another detail that attracted researchers' attention was the apparent disarray in which his tools were found.

Were his injuries caused by an accident or something more sinister? An early theory suggested Ötzi had been forced to flee his village, packing his tools in a hurry.

Time, however, ran out for researchers in Innsbruck. The authorities ruled that as Ötzi had been discovered on the Italian side of the border, the Iceman and all his belongings had to be moved to Italy, where they have remained in the South Tyrol Museum of Archaeology ever since.

There, scientists analyzed the corpse using computed tomography and DNA analysis. In 2001, radiologist Paul Gostner discovered an arrowhead lodged in Ötzi's left shoulder. Could Ötzi's death have been a case of neolithic homicide?

Later tests supported this hypothesis, especially in 2010 when neurologists discovered a buildup of blood around the stem of Ötzi's brain, suggesting a major trauma to the head. This evidence suggests that that he was attacked on the mountain, perhaps managing to escape with only a wound at first, before being hunted down and killed later.

These developments supported a theory of murder, but other findings indicated that Ötzi might not have been fleeing when he was attacked. Analysis of Ötzi's stomach shows that it contained grains and ibex, a wild goat. This belly full of meat suggests that Ötzi did not "eat and run" prior to his death but sat down to a hearty meal. Perhaps he was ambushed by his killer just after finishing dinner?

The exact circumstances that led Ötzi to his Alpine demise may never be clarified. Yet even if we cannot be sure why he died, modern archaeological techniques tell us enough to be able to construct a reasonable hypothesis as to what happened in his last, violent moments: Someone shot an arrow at him, piercing his shoulder blade. He fell, sustained a crushing injury to the head, lost consciousness, and bled to death on the mountainside. The climatic conditions of the Alps did the rest, encasing the body with snow, preserving the Iceman in the ravine in which he was finally discovered, more than 5,000 years later, on a warm September day in 1991.

—Carme Mayans