

1991-1997 Research on the Ice Man

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ABSTRACT - After the discovery of the Ice Man on 19th September 1991, the problem was how to restore and preserve the remains. During the initial phase of restoration, the objects were classified and tiny samples (milligrams) were taken from particular parts of the objects to define the raw materials that the artefacts were made from. Along with this, the first archaeological experiments began to acquire other information on the composition of the materials, the working technique and the functional purposes of each archaeological finding.

Key words: Ice Man, Restoration, Experimental archaeology

Parole chiave: L'Uomo dei Ghiacci, Restauro, Archeologia sperimentale

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After the discovery of the Ice Man on 19th September 1991, the problem was how to restore and preserve the remains.

This problem was quickly resolved, as the world-wide famous restoration department of the Roman-Germanic Central Museum of Mainz announced that they would take care of this case.

Other small findings including a hat made of bear's fur and a fragment of a bow were discovered during the 1992 excavations as well as the remains of a vessel made from birch tree bark that was subsequently reassembled with other fragments that were found in 1995 by Torstein Sjøvold.

After 4 years of successful restoration works on the Ice Man's artefacts, they were transferred again from Mainz to Innsbruck for yet another scientific analysis at the end of 1995. In the meantime a climatic room had been installed there, in which the precious remains were placed.

At the end of 1991 during the initial phase of restoration the objects were classified and tiny samples (milligrams) were taken from particular parts of the objects to define the raw materials that the artefacts were made from.

Since some raw materials had not yet been found in archaeological findings up till then, new methods

for identifying the materials had to be developed. It was for this reason that some of the research took longer than expected.

This was the case for the origins of the feathers of the arrows that were classed after long analyses by the Zoological Institute of the University of Mainz in ten possible types of birds that probably existed during the presumed life span of the Ice Man and precisely: the black woodpecker, the alpine chough, the alpine crow, the imperial crow, the wood grouse, the ibis, the golden eagle, the vulture, the Egyptian one and the griffin. In order to identify the mushrooms, analysis was carried out by the Institute of Organic Chemistry of the Technical University of Vienna and the Microbiological Institute of the University of Innsbruck.

The two mushrooms on the leather straps were identified as *Piptoporus betulinus* and the black blotch in the belt pocket as *Fomes fomentarius*. These two analyses are only part of the innovative research elaborated during experiments on the Ice Man.

In the meantime another analysis was carried out to no avail. Long after the discovery, the bow of the Ice Man still smelt like "cow's dung". Even though very modern methods were used by the IBM Laboratory of Organic Chemistry of Mainz, it was not possible to identify this smell. A substance was probably applied

to protect the bow from humidity, which was the greatest enemy of weapons. At present the bow does not smell any more.

Small particles of the internal lining of the birch vessel were analysed by the same Institute to acquire information as to the contents. Even though great effort was put into this research, it was unsuccessful.

In the meantime the first results of the various analyses were obtained and so in June 1992 a First International and Interdisciplinary Symposium was held at Innsbruck. The Institute of Pre- and Protohistory prepared a report which was published three months later. Other two volumes were also edited in 1995 and 1996. Experts who were working on the project, both in the scientific and scientific-popular fields, published many other studies.

As an outcome of the research on the Ice Man other archaeological issues came about which led to further research projects. One of these issues was the provenance of the flint used for the making of six artefacts. During a project financed by the Austrian Fund for Scientific Research, amongst other things, Alexander Binstener discovered the source of flint, the same raw material that the Ice Man used.

The deposit is in the small village of Ceredo on the Lessini Mountains, East of Lake Garda. In 1996 excavations carried out by the Institute of Pre- and Protohistory under the supervision of Gert Goldenberg showed in fact that Neolithic mineral and flint trading activities were carried out not only from Northern Italy up the Alto Adige and Hauslabjoch where the Ice Man was found, but this raw material was also used beyond the Alpine barrier up to the Danube area of Southern Germany.

Similarly, Walter Leitner of the Institute of Pre- and Protohistory carried out archaeological research and excavations at the Ötz Valley prehistoric settlement, which is probably where the Ice Man sought shelter. With regard to this the colleague of mine will draw up a report during this session

When the Ice Man's artefacts were brought back from Mainz, a detailed list of the equipment had to be made. With the new methods developed by the Institute, the scientific draftsmen Andreas Blaickner and Michael Schick elaborated models in scale and perspective. Normally these drawings provide clear details on the materials and the traces of the working techniques which otherwise can hardly be seen in the photos. Therefore these drawings are not merely documents but also representative interpretations and are much more expressive than the usual photographs.

A detailed photographic documentation was still created by the Huber Photographic Studio of Innsbruck as well as by other photographers. A complete written classification of all the different parts of the equipment was drawn up. This took almost two years and was

completed in 1997 when the remains of the Ice Man had to be transported back to Alto Adige as was agreed upon.

The elaborated documentation represents the introduction of the final publication on all the equipment of the Ice Man, which I will personally take care of in the next few years.

Along with this, the first archaeological experiments began two years ago to acquire other information on the composition of the materials, the working technique and the functional purposes of each archaeological finding. This work is being carried out under the supervision of Harm Paulsen of the Schleswig-Holsteinisches Landesmuseum in Gottorp Castle. I would like to give an example. It was affirmed even scientifically that the copper axe belonging to the Ice Man had no particular use as the metal was too soft for practical activities and it was probably a status symbol or a ritual object, a sign of dignity, a symbolic object or a ceremonial axe. The Ice Man must have been a religious man, a rich farmer, a shaman or a leader.

Archaeological experiments had never been carried out before with a copper blade of an axe. Paulsen made the hilt from a yew tree trunk with a branch that was bent towards the right. A groove was cut into the trunk with a branch. Gerhard Sperl of the Montanuniversität Leoben smelted a blade of pure copper. He then fixed the blade onto the hilt and glued it with birch tree pitch, tying it tightly with a leather strap just like the Ice Man's axe.

In order to carry out the bow experiment realistically the botanists of Innsbruck looked for a highland yew tree to cut. The particular growth of this tree had to be similar to the one used by the Ice Man to produce a new bow. The Man of Hauslabjoch had lost or broken his old bow and so obviously had to make another one in order to survive. He died before completing the task. As he had cut a green tree for his new bow, if we wanted to carry out the experiment in the same way, we had to work solely on green wood with ancient implements. The Ice Man chose a yew tree wood with 50 rings on a surface of 3.5cm inside the original transversal section of the trunk. This wood was just slightly better than the one we used for this experiment. This is one of the hardest woods of Europe. It was a hard job for our botanist to find a similar wood with close rings. After about a year of discussions with the forest authorities we obtained the permission to fell it - the yew tree is a protected species in Austria and it cannot be felled without authorization.

The bark and the sapwood were easily cut into but as there were two trunks the tree could only be worked on one side. Paulsen made a deep wide cut into the tree and hacked at the tree with the sharp copper axe. The cutting blade bore the blows well and only slightly lost its sharpness. Only on one occasion was it

re-sharpened. Using the same method as beavers the cut became deeper and after about 45 min the tree was felled. The experiment was successful!

This proved that the Ice Man's axe was used as an implement and that could also have been used as a weapon if need be.

Paulsen is now letting the wood dry so that it will not crack. Paulsen will finish the work that the Ice Man did not manage to do. He will also try out the bow to see if it works. The results are promising.

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