

# Preliminary research reports

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Ice-man or *Ötzi* as he is affectionately known was discovered in 1991 by two German hikers in the Alps on the Austro-Italian border. The hikers from Nuremberg were on a mountain trek when they came across what resembled human remains; they took a photograph and alerted the authorities. The police assumed the couple had found a 'glacial corpse', which are common in the area<sup>1</sup>. The Austrian authorities took charge and freed the body from the ice with a jackhammer (which some think accounts for *Ötzi*'s broken ribs and wounds on his side) and scattered and destroyed some of *Ötzi*'s possessions<sup>2</sup>. The body was then rushed to the forensic unit at the University of Innsbruck, Austria.

Professor Konrad Spindler took charge of the body and began his research, he determined from an axe found with the body that *Ötzi* was at least 4000 years old<sup>3</sup>, later forensic examinations, such as radiocarbon dating found *Ötzi* to have lived 5,300 years ago<sup>4</sup>. It was initially thought *Ötzi* was stuck in a snow storm<sup>5</sup> but he was later determined to have died of a lesion to the subclavian artery caused by an arrow wound<sup>6</sup>. Methods of Preservation The circumstances of *Ötzi*'s death, although unfortunate for himself were extremely good for modern scientists and archaeologists. The body of *Ötzi* is a superb example of 'wet mummy' or 'ice mummy' preservation. *Ötzi*'s body had been trapped under glacial ice for over 5000 years; this and the relatively low amount of sunlight received at that underground level helped to deter bacteria from growing in and decaying the body. In 2001 however Thomas Bereuter (of Vienna University of Technology) took samples of *Ötzi*'s skin to determine why *Ötzi* had been preserved so well.

In looking for chemical changes Bereuter discovered that *Ötzi's* body fat had been converted into a material known as adipocere, a waxy substance almost completely resistant to decay. Adipocere can only form if a body is in water, leading to the conclusion that the ice-man was not always frozen<sup>7</sup>. At Innsbruck *Ötzi's* body began to grow fungi after being exposed to room temperature during a medical examination, it was soon realised that *Ötzi's* alpine condition would need to be recreated; the body was put into a freezer and when taken out was only allowed to be in room temperature for half an hour<sup>8</sup>. In addition *Ötzi's* body is also sprayed with water regularly to prevent it from dehydrating. In 1998 *Ötzi's* body was transported to Bolzano (Italy)<sup>9</sup>, the move had to occur quickly to prevent another growth of fungi in the body.

*Ötzi* was soon rushed into the South Tyrol Museum, where a specially made display case was waiting; the ice-man is only put on display for a certain amount of time (12 hours) before being wheeled back into a freezer<sup>10</sup>. Sources & Supporting Evidence Source 1: Myself, J.....

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.. a with *Ötzi*. N. B. *Ötzi's* clothes have been recreated, highlighting how harsh alpine conditions must have been.

Source 2: T. Hurley, et al, *Antiquity* 1 Past Perspectives The body of *Ötzi*. The body is missing the epidermis (outer layer of skin) revealing the adipocere (fat converted to wax), which played a significant part in preservation. Source 3: This photo depicts information on the excavation of *Ötzi* and his artefacts. Taken from the Maritime Museum exhibit.

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Source 4: <http://www.bbc.co.uk/science/horizon/2001/icemanmummy.shtml>#Professor Berueter testing iġ<sup>1</sup>/<sub>2</sub>tzi's tissue, proving that adipocere played a significant role in iġ<sup>1</sup>/<sub>2</sub>tzi's preservation.

#### PART B: TUTANKHAMEN, THE BOY KING

##### Background of

Discovery Tutankhamen's tomb was discovered in the Valley of the Kings in 1922 by Howard Carter. Carter had been assigned as a director of excavations by Lord Carnarvon in 1907 as he was already a well-known excavator<sup>11</sup>. Despite the wide held belief at the time that the Valley of the Kings no longer contained any undiscovered tombs, Carter was convinced due to numerous monuments with Tutankhamen's name, which were found nearby<sup>12</sup>. Carter began his campaign for an undiscovered tomb in 1917, he dug near the present site of Tutankhamen's tomb however workers huts blocked him from proceeding. On 4 November 1922 Carter recorded and cleared the huts. He soon discovered a carved step, almost identical to others found in the valley.

Carter stated he 'almost dared to hope' that he had found Tutankhamen's tomb<sup>13</sup>. After Carter had uncovered the remaining steps he contacted Lord Carnarvon and waited until Carnarvon's arrival to proceed with excavations. Once Carnarvon had arrived with his daughter Carter broke through the tomb's entrance<sup>14</sup>. The tomb consisted of 6 sections; the entrance, corridor, antechamber, annexe, burial chamber and treasury. The tomb contained hoards of treasure however; part of it had been looted by grave-robbers.

Methods of Preservation The mummy of Tutankhamen is an example of dry mummy preservation. The ancient Egyptians had a long (70 days) and

complicated process to mummify a body for its journey through the afterlife. The first stage of embalming was known as purification, where the body was washed with a solution of natron salt and water<sup>15</sup>. The process then involved the removal of organs or evisceration; organs were then placed in canopic jars<sup>16</sup> and were found in the burial chamber. The body was then dehydrated and covered with natron for 40 days. After this the embalmer would rub wine and oil into the skin to give the mummy some semblance of a life-like appearance.

In Tutankhamen's case however the 'unguents' were used far too liberally and subsequently burnt away his skin tissue<sup>17</sup>. His body was then bandaged, a process which lasted 15 days. Herodotus stated that the Egyptians had "linen cut into strips and smeared on the under side with gum (resin)"<sup>18</sup>. Tutankhamen's arms also helped to identify him as a Pharaoh as they were crossed over his chest, in a regal position. After wrapping the body had a mask placed over it, and was then placed into the burial coffin. The dry conditions of the Egyptian desert also helped to provide an environment for preservation.

However nothing could hide the fact that Tutankhamen's body had been hastily and poorly preserved compared to both his predecessors and successors<sup>19</sup>. Despite this rather haphazard burial, Tutankhamen's mummy and tomb are excellent windows into the past (albeit only to the upper echelons of ancient Egyptian society). Tutankhamen's body may also provide an invaluable amount of information into the process of mummification and its variations. Today Tutankhamen's mummy is kept in the burial chamber of his tomb<sup>20</sup>, to further preserve him the tomb is only open at certain times of

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the year and only being limited to 400 tourists per day. The tomb is closed for the remainder to conserve the current condition of the mummy<sup>21</sup>.