

Frozen archaeology meltdown

To the Editor — In the central Asian Altai Mountains, approximately 700 tombs have been preserved for 2,500 years by ice lenses or permafrost¹. They contain frozen mummies, wood, leather and textiles, which are very rarely preserved and can provide a unique insight into the culture of prehistoric societies in this region. As a result of increasing ground and surface temperatures over the past century, these tombs and their deposits are now within only a few degrees of melting.

As in the Altai Mountains, climate change during the twenty-first century may have a substantial impact on sites of 'frozen archaeology' worldwide. The speed of the degradation has occasionally prompted rescue archaeology, carried out under less than ideal conditions with limited funding and a lack of long-term goals. For example, a coastal cemetery near Barrow, Alaska is eroding at rates of up to 20 m yr⁻¹, because the sea ice that used to protect the coastline has receded². As a result, indigenous people's remains that date back to the fourth century AD are being exposed at a rapid rate. At present, rescue work is carried out annually in an attempt to document, stabilize and relocate the cemetery material that is being washed away owing to high beach erosion.

Such rescue action is not always welcome. In 1993 a frozen mummy nicknamed 'The Ice Maiden' was discovered in the Altai Mountains in Siberia (see image). The unique preservation of this tattooed mummy and the warming Altai climate prompted Russian archaeologists to transport her to the Siberian capital of Novosibirsk for scientific study. The removal resulted in political unrest in the local shaman community, located in the Kosh-Agach region, who demanded that the mummy be reinterred. However, reluctant to leave the mummy to deteriorate, the scientists refused to return it to its thawing grave. After 16 years



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of debate, a petition with almost 5,000 signatures and a decision by the central government in Moscow, the plan is to return the mummy to a purpose-built exhibit in the museum at Gorno-Altai in the Altai region³.

For indigenous people, the loss of their archaeological treasures can have a detrimental effect: archaeology can support their heritage, land rights and political status. The impact of enhanced warming in the twenty-first century will be strongest in the cryosphere, where archaeological remains, including organic material, are particularly well preserved.

Climate change is already having a rapid and significant effect, with remains emerging where glaciers retreat, and where coastal erosion accelerates because sea ice is melting. Without a global body and a legal framework to mediate between the interests of scientists, governments and indigenous

people, the loss of precious archaeological remains both to the distant descendants of the mummified people and the scientific community will continue. □

References

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