Ancient Italian artefacts get the blues

Scientists accuse officials of neglect as chemicals discolour stored relics.

Alison Abbott

A mysterious blue sheen that is creeping over precious archaeological artefacts has sparked a political firestorm in Italy. Scientists are battling local authorities to save the damaged collection — and determine who is to blame.

The prehistoric treasures — including human bones and stone tools — come from sites near Verona, which were inhabited by some of Europe’s last known Neanderthals when anatomically modern humans were beginning to dominate the region. Scientists say that comparing DNA from the remains with DNA from Neanderthal bones found elsewhere may show how the last Neanderthals moved across the continent seeking refuge, for example.

But now some of the remains face irreparable damage, as they lie deteriorating in a former military armoury in northern Italy. The artefacts were moved there in 2007 and 2008 after Verona’s town council sold their original home — an eighteenth-century castle that provided overflow storage for Verona’s Natural History Museum. The money from the sale was intended to refurbish the arsenal to provide a new home for all of the museum’s collections, but the funds were subsequently reallocated.

Concerned scientists are about to send a petition to Sandro Bondi, Italy’s minister of culture, demanding that the artefacts be immediately transferred to safe premises. They are also calling for an expert committee to assess the damage, and for an investigation to identify who is responsible for endangering the collection — potentially a crime under Italy’s strict laws on cultural heritage.

Reid Ferring, a geologist and archaeologist at the University of North Texas in Denton, says he signed the petition because he finds it “devastating that the collection with such a high scientific value has been damaged”. He points out that Verona is a World Heritage Site. “You would think they would have paid better attention to their historic collections.”

The collection’s curator, Laura Longo — who declined to comment to Nature because she has been asked by the museum not to speak to the press — first became concerned when she gained brief access to the relocated artefacts in February, and found that some of the flint tools were turning bright blue. She then provided four samples of the discoloured flint to Gilberto Artioli, a geo-archaeologist at the University of Padua, for chemical analysis.

Over the next three months, she reported the problem to the museum’s director and also to Vincenzo Tine, the regional representative of the ministry of culture in Venice. Last month she sent a formal report to Stefano de Caro, the ministry’s general director for archaeology in Rome, and to the department of military police concerned with crimes against cultural heritage. That department has already referred the case to Verona’s public prosecutors.

Meanwhile, Artioli’s first analyses quickly showed that the samples — and also the cardboard they were delivered in — were impregnated with hydrocarbons, which he says may come from petrol, or from lubricants once stored at the arsenal and used to keep the weapons there in working order. “But this did not explain the blue colour,” he says. He suspects that hydrocarbon vapours carried a pollutant onto the flints, where it reacted to form a “very stable and durable” blue pigment that was previously unknown.
More chemical detective work could easily determine the source of this pollutant, Artioli says. But the results would be political dynamite. If the contaminant came from the walls or floor of the building, the municipality of Verona could be guilty of allowing cultural heritage items to be transferred to a building that had not been properly checked for pollutants.

Tine, whose office is responsible for ensuring compliance with cultural-heritage laws in the Veneto region, suggests that the source of the pollutant may be the padding in the storage cabinets acquired for the artefacts in their new premises. He also plays down the seriousness of the problem. "Only a hundred or so of the millions of objects in the collections have turned blue, and they can easily be restored to their original colour," he says.

But scientists see things very differently. "Up to 30% of the flints are turning blue," says Artioli. "Sure, we can bleach the colour out, but then palaeontologists will never be able to do any meaningful analysis from a chemical point of view." And although they have not changed colour, the bones and pottery are more porous than the stone tools and therefore will have a deeper exposure to the chemical pollutants, he says. "Now the summer temperatures are accelerating the chemical transformation," he adds. "The matter is urgent."

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