Mount Vesuvius eruption 'turned victim's brain to glass'

Nicola Davis

Scientists discover vitrified remains caused by immense 520C heat of disaster in AD79

When Mount Vesuvius erupted in AD79, the damage wreaked in nearby towns was catastrophic. Now it appears the heat was so immense it turned one victim's brain to glass – thought to be the first time this has been seen.

Experts say they have discovered that splatters of a shiny, solid black material found inside the skull of a victim at Herculaneum appear to be the remains of human brain tissue transformed by heat.

They say the find is remarkable since brain tissue is rarely preserved at all due to decomposition, and where it is found it has typically turned to soap.

"To date, vitrified remains of the brain have never been found," said Dr Pier Paolo Petrone, a forensic anthropologist at the University of Naples Federico II and a co-author of the study.

Writing in the New England Journal of Medicine, Petrone and colleagues reveal that the glassy brains belonged to a man of about 25 who was found in the 1960s lying face-down on a wooden bed under a pile of volcanic ash – a pose that suggests he was asleep when disaster struck the town.

The bed was in a small room that was part of the Collegium Augustalium, a building relating to an imperial cult that worshipped the former emperor Augustus. The victim, according to Petrone, is believed to have been the caretaker.

Petrone said it was when he recently focused his research on human remains found at the college that he noticed the black fragments in the caretaker's skull.

“I noticed something shining inside the head ,” he told the Guardian. “This material was preserved exclusively in the victim’s skull, thus it had to be the vitrified remains of the brain. But it had to be proved beyond any reasonable doubt.”

Now Petrone and colleagues have revealed a number of substances within the glassy material, including proteins typically found in brain tissue. Crucially, these were not found in adjacent ash or elsewhere in the site.

“The detection of glassy material from the victim’s head, of proteins expressed in human brain, and of fatty acids found in human hair indicates the thermally induced preservation of vitrified human brain tissue,” the team write.

The researchers say that while some of the substances may also be found in animal or plant matter, no such remains were reported during excavations. And analysis of charred wood on the site reveals that it experienced temperatures of up to 520C (968F) during the catastrophe.

“This suggests extreme radiant heat was able to ignite body fat and vaporise soft tissues; a rapid drop in temperature followed,” the team reports.

Petrone said the caretaker was killed instantly when deadly currents of superheated gases, ash and rock fragments, known as pyroclastic flows, swept through the town.

Other evidence backs up the grisly fate: the caretaker’s skull and other bones had exploded and become charred, while some of the bones – as well as a fragment of charred wood – also showed signs of glassiness.

The team also found a solid, spongy mass around the chest bones, probably formed from the lungs and other organs, Petrone said.

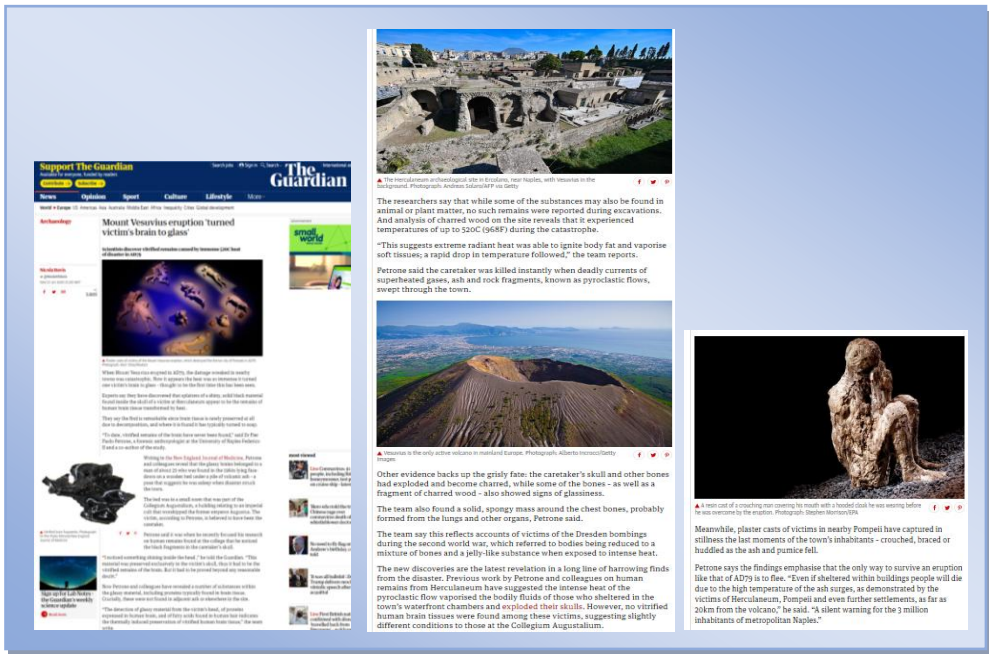
The team say this reflects accounts of victims of the Dresden bombings during the second world war, which referred to bodies being reduced to a mixture of bones and a jelly-like substance when exposed to intense heat.

The new discoveries are the latest revelation in a long line of harrowing finds from the disaster. Previous work by Petrone and colleagues on human remains from Herculaneum have suggested the intense heat of the pyroclastic flow vaporised the bodily fluids of those who sheltered in the town’s waterfront chambers and exploded their skulls. However, no vitrified human brain tissues were found among these victims, suggesting slightly different conditions to those at the Collegium Augustalium.

Meanwhile, plaster casts of victims in nearby Pompeii have captured in stillness the last moments of the town’s inhabitants – crouched, braced or huddled as the ash and pumice fell.

Petrone says the findings emphasise that the only way to survive an eruption like that of AD79 is to flee. “Even if sheltered within buildings people will die due to the high temperature of the ash surges, as demonstrated by the victims of Herculaneum, Pompeii and even further settlements, as far as 20km from the volcano,” he said. “A silent warning for the 3 million inhabitants of metropolitan Naples.”

https://www.theguardian.com/science/2020/jan/22/mount-vesuvius-eruption-victim-brain-glass



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