

**Teachers Notes**

**INVESTIGATING THE PAST  
Pompeii and Herculaneum**

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## **Investigating the past: Pompeii and Herculaneum**

### **THE DEATH OF POMPEII AND HERCULANEUM**

In 79AD during the night of August 23 or the early morning of August 24, ash began to blow from Mount Vesuvius, lightly dusting the areas downwind of it. However about one o'clock in the morning the plug of solidified lava that had long sealed the volcano gave way under pressure and molten rock shot some twenty kilometres into the air. This shredded into small particles and as it flew upwards it spread out in a flat cloud, raining debris on to Pompeii and Stabiae. Within two or three hours, Pompeii was about thirty centimetres deep in pebbly pumice and stone. Buildings began to collapse, causing many deaths. Fires broke out as lamps shattered and spilt their oil.

Thirty kilometres away at the naval base at Misenum, seventeen year old Pliny the Younger was visiting his uncle Pliny the Elder, a noted historian and Admiral of the Mediterranean Fleet. Pliny witnessed the eruption and later wrote two letters to the historian Tacitus in AD104 detailing his emotions and experiences, experiences that must have been similar to those of many of the men and women of Pompeii. These letters provide us with the only first hand accounts of the eruption and its consequences.

The following is an extract from the letters by Pliny the Younger to Tacitus.

“Though it was the first hour of the day, the light appeared to us still faint and uncertain. And although we were in an open space, it was narrow, and the buildings around us were so unsettled that the collapse of walls seemed a certainty. We decided to get out of town to escape this menace. The panic stricken crowds followed us, in response to that instinct of fear which causes people to follow where others lead. In a long close tide they harassed and jostled us. When we were clear of the houses, we stopped, as we encountered fresh prodigies and terrors. Though our carts were on level ground, they were tossed about in every direction, and even when weighted with stones could not be kept steady. The sea appeared to have shrunk, as if withdrawn by the tremors of the earth. In any event, the shore had widened, and many sea-creatures were beached on the sand. In the other direction loomed a horrible black cloud ripped by sudden bursts of fire, writhing snakelike and revealing flashes larger than lightning.”

At this stage Herculaneum had been largely spared the rain of pumice. Nonetheless many people left. At about one o'clock on the morning of August 25, the volcano's throat briefly abated, the massive column collapsed, sending a glowing cascade of material down the sides of the mountain. The avalanche quickly separated into two waves, one a hot, turbulent, fast-moving cloud of lightweight ash and gases. The other consisted of a denser, slower, ground-hugging flow of pumice and large rock fragments that moved towards Herculaneum at over 100 kilometres per hour, taking less than four minutes to reach the town. It roared through the town and caused the sea to boil when it reached the waterfront. No one could have survived. The volcano then proceeded to bury Herculaneum in a deep grave. This was followed by another surge and flow about an hour later. A third surge a few hours later buries Herculaneum even more and reaches the north wall of Pompeii.

In a fourth surge at about 7.30 am, a cloud of ash and gas swept through Pompeii and would have asphyxiated every person it reached. A fifth surge followed minutes later. The most powerful surge of all came at about 8.00am. This surge was probably responsible for the death of Pliny the Elder at Stabiae.

Herculaneum was buried under 20 metres of volcanic debris, while only four metres fell on Pompeii.

#### *Understanding the issues*

1. Explanation of terms: Lava; pumice; pyroclastic surge; Plinian Eruption
2. Map Study: On a map of the region locate Misenum, Stabiae, Herculaneum, Pompeii and Mount Vesuvius. Calculate the distance between each location
3. Read the account of the eruption in letters by Pliny the Younger to Tacitus. How useful is this account to archaeologists and historians? How reliable is Pliny's account?
4. Research: The difference between the ways in which Pompeii and Herculaneum were destroyed.
5. Film Study: What does the film reveal about the stages of the eruption? How is Pliny's account useful to volcanologists?

### **EXCAVATIONS AND ARCHAEOLOGY**

Herculaneum was not rediscovered until 1594 and serious excavation did not take place until 1709. It was not until 1748 that the first excavation site was opened in Pompeii.

To early excavators, Pompeii and Herculaneum were sites to be looted not explored or preserved. Rocco de Alcubierre who excavated at Pompeii in 1748 and later at Herculaneum, seemed more concerned with finding precious objects than preservation and documentation. While archaeologists such as the German Johann Joachim Winckelmann criticised the lack of organisation that existed at the excavation sites, anarchy still existed. It was Karl Weber, director of the excavations at Pompeii in 1749 who first proposed that rather than carrying out selective and uncoordinated excavations, they should uncover the site systematically, section by section.

However it was not until 1860 with the appointment of Giuseppe Fiorelli as director of Pompeian excavations, that a more systematic and professional approach was used. Recognising the unparalleled insights that could be gained into the Roman past by careful study of the ruins and all that they contained, Fiorelli set as his goal the total recovery of the vanished city.

A pioneer of modern archaeological methods, Fiorelli instituted a policy of completely clearing one site before moving onto the next, excavating areas between them as well. As Pompeii's streets, houses, walls and gates began to emerge, Fiorelli developed a grid system and was able to divide the city into regions and blocks (*insula*) and develop a plan for its systematic recovery from the metres of volcanic debris.

An important feature of Fiorelli's excavation was his technique of making plaster casts of the dead. Fiorelli pumped liquid plaster into the cavities where flesh and clothing had decayed. This was left to set and the lava chipped away to reveal an accurate plaster cast of the body at the moment of death.

As the digging proceeded, one of Fiorelli's guiding principles was that new finds, such as frescoes or furniture, be left in place wherever possible. He faithfully documented all his work and set a standard for subsequent excavators.

#### *Understanding the issues*

1. Explanation of terms: Excavation; preservation; conservation; grid; *insula*.

2. What were the problems associated with many of the early excavators at the sites in Pompeii and Herculaneum? What should be the primary ethical and professional duty of archaeologists at sites?
3. Research: The nature, use and benefits of the grid system developed by Fiorelli.
4. Outline the technique used by Fiorelli in making plaster casts of the dead? How useful are these casts for archaeologists and researchers?
5. Discussion: In the eighteenth century archaeology was more about looting than scholarly pursuits.
6. Film Study: What does the film reveal about the methodical and professional approach taken by Fiorelli in Pompeii?

### **BREATHING LIFE INTO THE PAST -**

Fiorelli's vision of a restored Pompeii encompassed far more work than he could do in his lifetime, but his successors took up both his goal and his disciplined methods of excavation. Foremost among them was the archaeologist Vittorio Spinazzola. From 1910 to 1923, Spinazzola oversaw an ambitious project to uncover the Via dell'Abbondanza. Under his guidance the thoroughfare and the buildings lining it began to take on some of their appearance prior to the eruption. Following a technique pioneered by Fiorelli, Spinazzola first drilled down to establish the route of the street, then began digging out the structures from above. After removing the debris, he protected any furnishings or frescoes found within buildings and then shored up the walls to prevent them from collapsing when the street itself was cleared.

One of Spinazzola's outstanding contributions to the restoration of Pompeii was his meticulous reconstruction of the upper stories, windows, balconies and roofs of buildings lining the Via dell'Abbondanza. He was also one of the first archaeologists to document the phases of excavation with photographs

. Amedeo Maiuri was in charge of excavations at Pompeii between 1924 and 1961. He developed a scientific approach to work at Pompeii by excavating the lower levels of the site to provide new evidence of its historical development. He also had greater success than some of his predecessors in restoring houses that had been excavated at various times in the past. From 1924 to 1941 he concentrated on the area around the Via dell'Abbondanza., his main aim being to uncover the *insulae* on either side of the street. Maiuri next turned his attention to the southern part of the city between the Via delle Scuole and the Triangular Forum. But Maiuri was not content to pursue his exploration of the buried city as a coherent whole. He felt it was only by deepening the excavations at the most significant, and topographically most important points, the forums, the temples, the city walls and the oldest houses, that they could hope to shed light on the period of the city's origins.

The appointment of Maiuri also marked the permanent reopening of investigations at Herculaneum. Maiuri abandoned tunnelling and worked methodically from the surface down and held rigorously to the modern practice of leaving as much as possible in place, such as pots on a stove. As the laborious digging proceeded, the town's character became more apparent, confirming scholar's speculations.

In September 1943 repeated bombardments by the allies during the war added to the disasters suffered by Pompeii since the earthquake of AD62.

In 1951 work on the site was at last resumed with new resources available. In just over ten years some ten *insulae* were totally cleared, virtually without documentation let alone publication, and with hardly any of the excavated structures being restored or protected. This led to criticism of his work and techniques. Also buildings excavated in earlier periods continued to decay before being recorded. The increase of tourists, together with worsening atmospheric pollution, exacerbated an already disastrous situation. Maiuri was succeeded by Alfonso de Franciscis as director of the archaeological service, and he continued with the excavations. In 1977 Fausto Zevi took over as director. He suspended excavation activities and used every available resource for restoration and documentation programs. At Herculaneum, Giuseppe Maggi was director of excavations from 1971 to 1984. In May 1980 his excavation work on the vaulted chambers built into the sea wall revealed more than 150 victims, suggesting that many of the inhabitants may not have survived the catastrophe.

*Understanding the issues:*

1. Explanation of terms: Topography;
2. Map Study: Locate the areas excavated by Spinazzola on a map of Pompeii
3. List the variety and use of buildings excavated by Spinazzola and Maiuri. Describe one of these buildings in depth.
4. Research: Analyse the work of Giuseppe Maggi on the seawall at Herculaneum in 1980
5. Discussion: Maiuri's success as an archaeologist was overshadowed by his record on documentation and restoration.
6. Film Study: What does the film reveal about the changing methods and contributions of archaeologists?

### **THE DEAD REVEAL THEIR SECRETS.**

Sara Bisel, an American physical anthropologist and archaeologist who specialised in the analysis of ancient bones, was invited to work in Herculaneum in 1982, to preserve newly found skeletons, excavated by Giuseppe Maggi earlier that year.

To Sara Bisel, the well preserved skeletons were just as important as treasures excavated from the sites, particularly as few other skeletons have survived, as the Romans cremated their dead. Her research was valuable as bones indicate much about the people and how they lived.

The skeletons had been well preserved because they had been kept continuously wet by groundwater seeping through the volcanic soil and had not endured temperature or humidity changes. However exposure to air brings about a quick deterioration. Each bone was washed with a soft toothbrush and dried for a few days. Bisel then dipped the bones in an acrylic plastic emulsion and allowed them to dry and harden.

The research by Bisel on dozens of skeletons has provided information about their height, whether they were well nourished, types of diseases and whether the person did manual work for a living. The state of a woman's pelvis enabled her to determine age and the number of babies she had. An examination of teeth could indicate whether the person had cavities, abscesses or periodontal disease. The research by Bisel has guided artists in fleshing out physical features and portraying how the different people may have looked.

The high level of lead in some of the bones has led scholars to debate whether lead poisoning could have been widespread among Romans. The most plausible explanation for people having ingested lead via the lead water pipes or from boiling grape syrup in lead vessels.

Estelle Lazer from Sydney University also researched human skeletal remains in Pompeii for evidence of age, sex, height, population affinities and evidence of disease or injury. The research indicated that the victims reflected a broadly representative sample of a normal population. The majority of the deaths were due to asphyxiation, others died of thermal shock caused by the intense heat. Most of the people would have died very quickly. Estelle Lazer made use of modern technology such as CT scans and X-rays, and updated the methods of Fiorelli by using translucent resin instead of plaster.

### *Understanding the issues*

1. Explanation of terms: Forensics; CT scans; translucent resins, anthropologist
2. Research: The difficulties in preserving objects and bodies once they have excavated.
3. What medical, dental and physical features have been revealed about the victims in studies by both Sara Bisel and Estelle Lazer? What other features of the victims have been revealed in these studies?
4. Outline the reasons why the skeletal remains were found in such good condition.
5. Discussion: How much of the work of Bisel in building up profiles of the victims do you think is science and how much is supposition?
6. Film Study: How has the work of Bisel and Lazer contributed to our understanding of life in Pompeii and Herculaneum

### **EXPANDING OUR KNOWLEDGE**

The American vulcanologist Haraldur Sigurdsson studied the volcanic deposits at Pompeii and Herculaneum in his research on the timing and nature of the eruption in 79AD. The study of the skeletal remains and the way they lay in the strata provided key material for his investigation. The account by Pliny the Elder gave geologic information as to what was happening first at Pompeii and later at Herculaneum. They correlate with data made possible by new vulcanological concepts developed in the 1970s and corroborated since the eruption of Mount St. Helens in the USA. Each phase of the eruption deposits a stratum with a characteristic range of grain sizes. To Sigurdsson grain sizes are the fingerprints of an eruption. They were the 'bones' he could investigate. A Pompeian expert from the University of Maryland in the USA, Professor Wilhelmina Jashemski, spent thirty five years from the 1970's reconstructing the histories of the city's gardens and solving the mystery of the Garden of Hercules. She believed that this was a garden where blooms were used for perfumes. Through a careful recovery of surviving pollen grains, as well as carbonised seeds, fruits, vegetables, stems, and traces of root systems, she has enabled botanists to identify the plants Pompeians grew for pleasure, food and profit. Her methods were similar to archaeologists who used impressions left in the debris when bodies decayed to make casts of ancient roots. What Jashemski could not glean from the analysis of roots and other physical remains, she learnt from botanical imagery found in Pompeian art.

Samples of soil sent by Jashemski for testing to Professor G W Dimbleby at London University, identified 21 different kinds of pollen grains, but weed pollen was almost entirely absent.

The work of archaeologists and conservationists has also been enhanced by the use of infra-red photography, 3D laser scan technology, spectrographic analysis, x-ray diffraction, electron microscopy, neutron activation analysis, high resolution digital cameras to create a three dimensional model, and sophisticated computer technology.

### *Understanding the issues*

1. Explanation of terms: Pollens; carbonised; stratum
2. Research: Choose any TWO pieces of scientific equipment used by archaeologists or scientists, and indicate how they have been used in Pompeii or Herculaneum for research. Eg. 3D laser scan technology
3. Outline the work of Haraldur Sigurdsson in analysing the impact of the volcano on Pompeii and Herculaneum
4. Discussion: The significance of the Garden of Hercules for our understanding of the lifestyle of the people of Pompeii
5. Film Study: How has the film shown the value of science and technology in making a comprehensive study of Pompeii and Herculaneum?

## **CONSERVATION, ETHICAL AND HERITAGE ISSUES**

The excavation of Pompeii and Herculaneum has raised a number of important issues. There is the issue of whether archaeologists should reconstruct a site or leave it as they found it. While the reconstruction of a site may be an act of preservation there is the issue of just how authentic a reconstruction can be. There is also the issue of the types of material used in the reconstruction and the actual methods used. Restoration work requires knowledge of specialised techniques. These conditions have not always been met. There is evidence that restoration work, using for example poor quality concrete and mortar, has actually hastened the deterioration of buildings at both Pompeii and Herculaneum.

In both these sites excavation has been carried on for well over two hundred years with excavators of differing standards, aims and methods. In the early days of excavation, little thought was given to safeguarding a site from damage. Diggers were little more than treasure hunters with little regard for conservation.

Both Pompeii and Herculaneum suffer from tourism and pollution. Millions of visitors visit the sites each year. These visitors inevitably walk around the sites, wearing down footpaths as well as exposed ancient lead pipes. People touch the plaster and paintings leading to further deterioration. Some visitors take away small pieces of stucco or marble which leads to further disintegration. Graffiti continues to be a major problem with vandals even leaving their marks on paintings. Many conservationists believe it is now imperative that visitors should be limited in where they can walk, and what they can visit. However the tourist dollar is used in the restoration and preservation of these sites and any limitation of visitors would cause financial concerns.

The fertility of the region is creating another problem. Over thirty parasitic plant varieties have been found on the site and have attacked the walls and buildings. Vegetation also attacks concrete floors and can totally destroy mosaic floors. On the tops of walls,

brambles and fennel take hold, soon forming a great mass of vegetation that results in falling masonry. Ivy is also a problem.

It is essential that more money is made available to restore both these sites to an acceptable level and to avoid what some have called the second death of Pompeii. Authorities have a major role to play in seeing the necessary work is carried out promptly and efficiently. In 1983 authorities in charge of the Pompeii site asked the French archaeologist Jean-Pierre Adam to prepare a technical report on the damage sustained to Pompeii following the tremors of November 1980 and to evaluate all possible methods of restoration. In 1984 the European Union awarded the sum of 36 billion lire for this restoration work, the first payment to be made in 1985. However this urgent work was delayed because of administrative conflicts and problems. To some archaeologists Pompeii has become an example of how not to proceed in matters of restoration. Pompeii was declared a World Heritage Site by UNESCO in 1997. Administrators of both sites have been allowed to use private investment to achieve their outcomes. In 2002 the Pompeii Trust was established in order to try and obtain some of the necessary funds required for preservation and restoration. In 2004 the Packard Humanities financed a \$110 million project expected to take ten years to protect and conserve the excavated areas in Herculaneum.

However an increase of government input and private sponsorship is necessary, together with international rescue missions, if these two major sites are to meet the challenges of restoration and conservation in the future.

Until more recent times, few people seriously questioned the ethics involved in displaying human remains. However this is now becoming more of an issue particularly with the discovery of many bodies at Herculaneum. A number of questions need to be raised. Do we have a right to examine archaeological sites as they exist or should remains of the dead be removed? Should remains of the dead be reburied where they were found? Is it more acceptable for their remains to be viewed in museums? Should plaster cast representations of the victims in their final moments of agony be classified as bodies or remains of the dead? Some feel viewing the remains of the dead is an invasion of privacy. Others see it as a violation of basic religious beliefs and that the dead should be given a final resting place.

### *Understanding the issues*

1. Explanation of terms: Autopsy; parasitic; UNESCO
2. Research: Choose any TWO of the following conservation problems and list the impact of this problem and a possible prevention – High humidity, finger marks, insects and vermin, dust, air pollution.
3. Outline the impact of tourism on the sites at Pompeii and Herculaneum
4. What is the impact of rising costs on restoration and preservation? Why is international help vital in this work?
5. Discussion: (i) Should ancient sites be preserved in their present form or be reconstructed?  
(ii) Should human remains go on display to the public?
6. Film Study: What does the film reveal about the problems restoring and conserving sites of the stature of Pompeii and Herculaneum?