SOLFATARA

On the 17th of December we went to visit the Solfatara with our teacher Mrs. Carpentiero. It was a very good experience which taught us many things about our city, above all because our guide, Marco, was very prepared and explained us the story and the features of the Solfatara in a very simple way.
First, he showed us the environment of the volcano. We were very surprised when we noticed that it is not a deserted area: there were houses and some peolpe living in them! This happens because the area of the Solfatara is not completely desolate. There is a zone in which there is a lot of vegetation and it is very comfortable to stay in.
Mostly, you can find the typical plants and trees of the Mediterranean; but the growth of this vegetation is highly influenced by the environment of the Solfatara.

Examples of vegetation in the Solfatara area.

For instance, the Roverella, a tree, has a thicker cortex than the rest of the exemplaries, to protect itself from a specific gas that is in the air surrounding the Solfatara.
So, we walked through this "green area" and, then, we arrived in the real volcanic zone. Here, we could have a complete view of the magnificent landscape.
Marco told us that the Solfatara is one of the forty volcanos which constitute the Campi Flegrei, and it is three kilometres away from the center of Pozzuoli. The name comes from the Latin, Sulpha terra, "land of sulfur". In fact, the Solfatar is a very popular tourist attraction thanks to the emissions of sulfur dioxide, commonly called "fumarole".

The Campi Flegrei were formed about 40000 years ago and their name comes from the ancient greek, meaning "ardent".
The Solfatara formed about 3700 years ago and last erupted in 1198. It is considered as one of the most dangerous volcanoes of Europe, since it has been quiescent for quite a while and is supposed to be erupting in a highly harmful explosive way. But, there are other hypothesis that think that the volcano is being quiescent to become definitively extinct.
There is a clear differentiation between the area that you see as soon as you get into the Solfatara zone, and the internal area. The first one is surrounded by plants and trees, while the other one is totally white, with no vegetation. This happens because of the change of the thermal gradient (the temperature of the soil) and the different composition of the two soils. In fact, the internal area contains a lot of sulfur, which makes the growth of plants difficult.

A great phenomenon that can be observed in Campi Flegrei are the **mud pools**. They are real pools containing boiling water and mud. This happend because there some rocks in the Solfatara that are not permeable, and they retain the rain that mixes with the dust that is all over the area. The rain and the dust together form the mud, which contains several materials: sodium, calcium, sulfur, ammonium salts, salts of ammonia, aluminium salts, potassium. The water "boils" not because of the temperature, which is variable, but it boils because of some gaseuous emissions, in particular hydrogen sulphide and sulfur dioxide.

The whole territory is highly influenced by the presence of the sulfur, which gives the soil the color white (**bianchetto**), and that is present in the air.
The bianchetto was very useful in the ancient times. For example, the inhabitants of Capua, payed 30000 golds to extract the bianchetto, then turned it into dust and mixed it with the Spelt flour, and then ate it. In fact, it contained a lot of minerals. Nowadays, the sulfur is used to create the gunpowder, pesticides and beauty products.
The ancient Greeks used it to wash their clothes, while the ancient Roman females used it to dye their hair blond.
The air near the fumaroles contains a small percentage of arsenic. The arsenic is considered as a poison, but in a small percentage, and combined with the sulfur, is good for our health: in fact, they are natural bronchodilators.
Another curiosity: since the territory it totally white, it is used to produce solar power, since the colour white reflects the sunlight easily and the solar panels can

be charged very fast.

The area is completely white.

We all know the reason why the Solfatara is so famous: the **fumaroles**. There are about 300 fumaroles in the whole area, and some are bigger than others.
A fumarole is, simply, a gaseous emission. They can be compared to the valve of a pression cooker: in fact, the emissions are due to the contact between the water and the heat in the subsoil, that obviously generates water vapor. Together with the water vapor, some gases are released: carbon monoxide, carbon dioxide, sulfur dioxide, hydrogen sulphide. Also argon is released. By observing the quantity of argon, we can predict the next eruptions. Because, the gases are faster than the magma in going through the volcanic basin. When the temperature of the water vapor gets higher without any explication, it means that the magma is going to be released soon (ofter in 24 hours).
Around the fumaroles there are some rocks put by the man that are then used to produce souvenirs.
The fumaroles generate a lot of noise too, that is caused by the pressure.

A big fumarole and a medium-size fumarole.

Another big attraction are the natural stoves ("**Stufe**"). They are two ancient grottoes which were excavated in the side of the mountain at the end of the 19th century to create natural sudatoria or sweating-rooms, which were later covered in brick. The heat in the grottoes provoked heavy sweating which forced the inhalation of the sulphureous steam which was released through the walls. They were considered excellent for the cure of respiratory diseases, skin diseases, and rheumatism.
The two grottoes reached respectively a temperature of 60°C and 90°C. As a joke, they were renamed "Purgatory" and "Hell".

One of the two grottoes.

The territory of the Campi Flegrei is formed by effusive rocks, and the deeper you go in the undersoil, the more porous they are. In fact, in you throw something very heavy on the soil of the Solfatara, the noise produced sounds like you're waking on something empty. The ancient Greeks explained this by saying that the undersoil is empty due to the battles between Zeus and the Giants, which very highly destructive.
But, the real reason of the "**echo effect**"is the journey of the vibrations in the undersoil. They go as deep as they can, but at a certain point they get in touch with a specific type of rock, the stunted rocks, that send them back. So, actually, the undersoil is full.

Another example of the territory, with a fumarole in the background.

This was the end of our experience. It was very useful to learn more about our city and it was very pleasant. The part I enjoyed the most were the fumaroles. Some of us even tried to use the "benefits of the vapor". I did, and, actually, I felt very relaxed. So I can say that the ancient Romans were right.