

## Titus and the Ugly Rocks - A Mineral Mystery Story

About 2500 years ago, Titus's shop in Athens was legendary, crammed with the rare and marvelous rocks and other wonders of Nature. One day, Titus' cadaverous servant Aegirine was walking through the market and noticed an old friend, the slave Xanthias selling produce. Aegirine knew that Xanthias had recently moved with his master to a small farm overlooking Lavrium, south of Athens. Xanthias was despondent. He moaned that the land was poor. His master was so hard on him. He labored in the sun all day and still they barely eked out a living. Even worse, they were in sight of the silver mines at Lavrium, reminding them daily of the riches that fell to others. Aegirine noticed that, among the olives and cheese, was a pile of rocks of an ugly violet-brown color.

"What are those?"

"We pick them up all over the place. They are soft and some people try to carve them. We sell a few, but they aren't really that attractive."

"Perhaps my master will be interested in some," said Aegirine and they negotiated a price. Aegirine felt he had paid too much, but he was sorry for his friend and bargained less rigorously than usual. Fortunately Titus was intrigued by ugly rocks.

"I've not seen its like before. It's so soft I can almost scratch it with my fingernail. It's like a clay or perhaps like horn or maybe hard pine resin. Are you sure this is rock?"

Aegirine shrugged." He tells me this material lies on the surface and can be dug from the ground. I have no call to disbelieve him".

"Notice how heavy this is, even though porous in appearance. Heft it in your hands and feel how unlike clay or bone it is."

In the evening Titus sat at his bench pondering the ugly stones. The weight of the samples perplexed him - not as heavy as metals, but too heavy for common rock. Maybe there was metal trapped within the stone with some airy substance. He considered what might drive free the airy portion. Perhaps heat!

A piece held carefully in a candle flame began to soften -until Titus dropped it as his fingers singed. Bemused, he thought about how best to hold a rock in a flame. Perhaps the answer is not to bring the rock to the flame, but the flame to the rock. He put some small fragments of the ugly mineral into a ceramic bowl. Then he found a hollow tube made of bronze. He set the bowl close to the flame, the using the tube, blew the flame on to the sample. It took a while to learn how to aim the flame. The first burst of fire propelled the samples from the bowl and he had to start again. Eventually he was able to pin the rock against the hardened clay by the force of his breath. The samples looked like they were beginning to melt! But he kept running out of breath just as the process began in earnest. Finally he learned he could breath in and out through his nose while blowing out with his mouth, if he didn't think too hard about it. Soon he had a continuous hot flame blasting the little rocks, and they melted to a puddle. Airs from the samples wafted out his windows. Eventually he stopped, gasping, and waited for the puddle of liquid with partly melted rock fragments in it to cool. To his great surprise, the puddle glittered with little spots of silver metal. Metal had been freed from the stone.

In the morning Titus sent Aegirine to deliver a note to Xanthias' master with these glad findings. Soon the poor land become a rich mine. A few months later, Titus asked Aegirine if he had heard any more from Xanthias. Aegirine noted he rarely saw his friend now, and when he did, Xanthias would barely talk to him.

"Why not? " asked Titus. "Is life not better now that his master is prosperous?"

"Oh, he's complains now that he no longer sees the sun and fields. He spends his days all below ground now, digging rock in that dark, dusty mine. There are some people you can never please, I guess."

OK you 21st Century mineral enthusiasts - what mineral makes up Titus' ugly rock?

-Dr. Bill Cordua, University of Wisconsin-River Falls

Answer: This is chlorargyrite, a silver chloride. This mineral, sometimes called "horn silver," was a major ore in Nevada and elsewhere.