

## Natural Sciences examines Ancient Art (i) facts

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Briefly I introduce the subject of natural sciences applied to artifacts of archaeological, history of art and cultural heritage origin, with some examples. Natural science in archaeology is coined *archaeometry* and it is an interdisciplinary field which emerged essentially in the 60s in Oxford University. Archaeometry or archaeological sciences give answers to questions of *Where? When? How? Why?* of past human societies. Artifacts like stone tools, ceramics, mural and panel paintings, organic and inorganic origin manufactured or processed materials, utensils, ancient devices and more. Stone tools (flint, obsidian etc) e.g., are studied for the manufacturing technique, the *chaines operatoire*, and exchange via trade and distance of transportation. Via archaeometry the determination of the time since they were made is possible, as well as, via chemical and mineralogical analysis the source that they come from is determined, that is the raw material for their provenance. Rock art paintings in caves made by ochres and charcoal are analysed and dated by radiocarbon. A pink powder was found in a tomb (“tomb of actress”) excavated at Delphi and dated in 400–350 BC. The identification of Sulphur (S) and Mercury (Hg) but Pb as well clearly identifies the powder as cinnabar, that is mercury sulfide HgS a red pigment very commonly used since antiquity, mixed with PbO white lead. This was used as make-up of actress face. Cinnabar and lead white are poisonous; and it is most probable that this young actress died from the inhalation and skin penetration of these toxic powder. Groups of ceramic vases based on their chemical elements, when processed by statistical analysis, imply identification of similar clay source. Conservation programs of mural paintings reveals the composition of organic and inorganic compounds of pigments, binders, preparatory layers, and mortar strength and composition; and define past rescue operations. The interdisciplinarity of material culture and natural sciences deals with multiple methods, techniques, protocols, types of archaeomaterials for the investigation of the human past.

(More on this see the video and the ppt presentation)



Ref.: Liritzis et al (2020) Archaeometry: An overview. *Scientific Culture*, Vol. 6, No. 1, pp. 49-98 ([www.sci-cult.com](http://www.sci-cult.com))