

ANCIENT SCULPTURE POLYCHROMY

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Most sculpture that we have from ancient Greece lacks any sign of colors or pigments. Because of this fact, the casual observer may not even consider that this was not the intended state. However, through scientific research and analysis of the sculptures, and through cross referencing with literary material, we know that this is not the case. Through research we know that practically all sculpture and architecture was brightly colored. We examine some of the scientific methods that are utilized in order to ascertain more insight into the original coloring of a sculpture. This becomes very useful when most of the pigments would have faded away due to exposure to light.

The first evidence that we have that ancient sculpture had coloring of any form, was from the sculptures that were covered in ash in Pompeii. The ash was able to protect the pigments from the harmful effects of sunlight. Because of this the pigments of these sculptures were preserved significantly better than any those used on previously discovered sculptures. This makes it clear that the sunlight is a significantly harmful factor when it comes to pigment preservation.

Many of the early attempts at the prediction of the colorization of the sculpture and architecture, was done before many of the scientific techniques that are now used today were known. This means that most of those reconstructions were primarily based on the antithetical preferences of the historian attempting the reconstruction. These reconstructions only accounted for a few bits of evidence that was available at the time. The primary evidence was if color was clearly visible on the sculpture, it if was not, then it was up to the historian to decide what color should be placed there.

As more scientific methods of determining the colorization or the pigment of sculptures were developed, the accuracy of the reconstructions began to converge to the ground truth of how it may have been originally painted. We will go through all of the methods that are used commonly now in order to assist in the determination of the color if not the pigments for ancient sculpture.

Raking Light This is a method that involves shining light from a very sharp angle, almost parallel to the surface of the sculpture. This method is used to pick up on the radiation resistance of different pigments, and colors. Anything exposed to solar radiation will get damaged over time, some materials will get damaged faster than others. Having a paint over the marble, acts like a shield, protecting from the solar radiation. So instead of the marble getting damaged, the paint gets damaged instead. This means that there will be a raised portion, where the paint was weathered away instead of the marble. This is depicted in figure 1.

This method becomes very useful to determine where different pigments were on a sculpture, and to ascertain the location of the transitions between them. Since each pigment would protect the underlying medium different amounts, each pigment

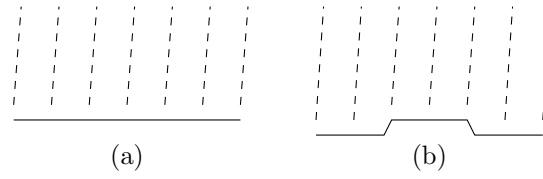


FIGURE 1. Demonstrating the process of solar radiation wearing through the marble surface, where the center segment is protected by some pigment. Over time smooth surfaces of (a) will develop bumps like the surface of (b).

would leave a different sized "bump" on the sculpture. There is little to gain about the actual color using this method, but it does allow for knowing where the different colors start and end.

By shining a light almost perpendicular to the surface of the sculpture it is possible to see these microscopic ridges on the surface of the sculpture. This process is clearly depicted in 2.

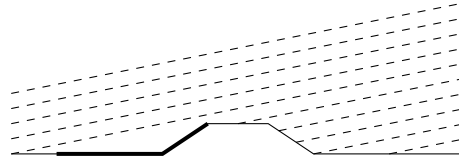


FIGURE 2. Demonstrating how using raking light will cast shadows caused by small ridges on the surface of a material. This allows for the determination of where pigments would have been present.

This method of raking light does not provide researchers with too much information about what pigments were actually present on a sculpture, but it does help in the determination of the regions of different pigments. Thus if a pigment is determined anywhere in the region, it is reasonable to believe that that pigment was used for the entirety of the region.