

Ancient Color

This website was created as an extension to the special exhibition *Ancient Color*, presented by the [Kelsey Museum of Archaeology](#) from February 8 to May 26, 2019. We often associate ancient Rome with white marble sculpture and austere architecture, but Roman statues and buildings were actually painted in vibrant hues, and homes, clothing, and art were bright with color. *Ancient Color* examines the use of colors in the ancient Roman world, how these colors were produced, what the Romans thought about them, and how we study them today. In addition to displays of [ancient artifacts](#) from the Kelsey Museum collection, this website invites visitors to explore the scientific techniques employed by conservators who study how the Romans made, used, and experienced color.



Ancient Color

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Introduction

When you read the word "Roman," what colors come to mind? The grays and whites of marble sculpture? The weathered hues of a wall painting?

What about vibrant red? Sumptuous purple? Brilliant blue?

The Roman world was much more colorful than its faded remains suggest. Merchants traded far and wide for the raw materials to produce a variety of pigments and dyes, and the many ways they were put to use reflects the significance of color in Roman culture. Artifacts of every variety can retain evidence of color, from the still-vibrant red and green threads woven into a cloth bag to the invisible traces of blue pigment on a marble head.

In this exhibition, on view at the Kelsey Museum of Archaeology from February 8 to May 26, 2019, we invite you to explore the colors of the Roman world — its sources, its uses, its meanings — and to discover how modern science is revealing more about ancient color than ever before.

Events



This is a watercolor reproduction of just one section of wall painting from a room in the Villa of the Mysteries at Pompeii. Watercolor on paper. Artist: Maria Barosso, 1924–1925. KM 2000.2.7a,b

The website content is grouped around three main themes. In the *Creating Color* section, visitors learn how the Romans gathered, processed, and traded pigments and dyes. Featured artifacts include the stone mortar and pestle used to grind up raw materials, as well as ceramic bowls with traces of green and red pigments. This section also focuses on the production of Egyptian blue, the world's oldest synthetic pigment, and of Tyrian purple dye, an expensive color extracted from the mucus of a special kind of sea snail.

Creating Blue

Egyptian blue is the world's oldest known synthetic pigment. It originated in Egypt over 5,000 years ago, around 3300 BCE. Known production centers were at Amarna and Memphis, and in the Roman period it was also manufactured in southern Italy, around the Bay of Naples. Egyptian blue was relatively inexpensive to produce and was traded throughout the Roman Empire as a less costly alternative to indigo, which was imported from India. In the ancient Egyptian language Egyptian blue was known as *hsbd-iry*, which means artificial lapis lazuli.

Precise ingredients and a very hot furnace were needed to create Egyptian blue.

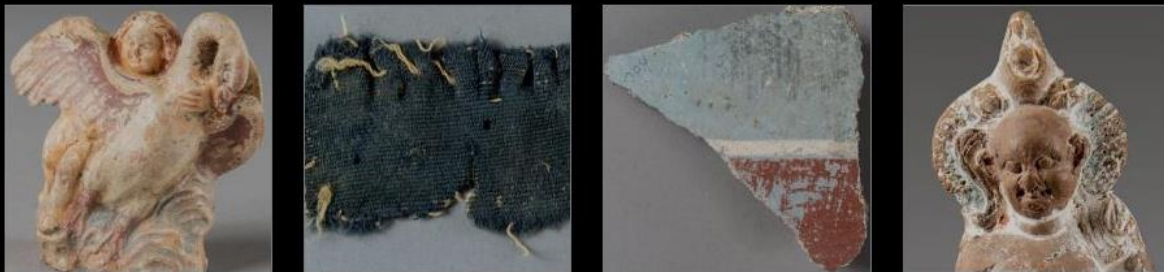
- First, sand, natron (sodium carbonate) or ash, and copper minerals or bronze shavings were mixed to a flour-like consistency.
- This mixture was then rolled into small balls which were placed in a container and put in a furnace.
- The furnace was heated to 850 to 1,000 degrees Celsius, causing the mixture to solidify into a blue, glassy lump called "frit" that could be ground into a pigment.



Three stages of Egyptian blue. A lump of blue frit (upper left); the pigment in powder form (lower left); and as applied to an Egyptian mummy mask (right).

Egyptian blue ceased to be used as a pigment with the fall of the Roman Empire, but modern researchers are discovering new applications for it. Egyptian blue luminesces (appears to glow as it emits light) in the infrared range, and recent experiments have shown that finely ground (or "micronized") Egyptian blue can be used as a fingerprint dusting powder (read the article).

Artifacts



In *Using Color*, website visitors are invited to explore a variety of Roman-period artifacts that still preserve their bold colors, including sculpture, fragments of wall painting, funerary inscriptions, and textiles.

Wall painting fragment

The wall from which this fragment comes was painted in two phases. First, bright, bold pigments were applied directly to the wet wall plaster in a technique called *a fresco*. Once the plaster was dry, shading and details were applied to the dried wall in a second layer of pigments that were mixed with a liquid binder, a technique called a *secco*.



Mortar, plaster, and black, white, red, yellow, green, Egyptian blue, and purple pigment

Roman period (2nd–1st century BCE)

Italy

Gift of Mrs. David Dennison, 1977

KM 1977.3.11

[View in Context »](#)

The *Investigating Color* section explains a variety of innovative scientific techniques used to investigate traces of color on ancient artifacts. In particular, two case studies showcase the original research performed by Kelsey Museum conservator Caroline Roberts and her colleagues at the Detroit Institute of Arts. They investigated a mummy portrait from Roman Egypt to find out what pigments were used to create this beautiful painting. The second project revealed microscopic traces of different colors on a seemingly white marble head of Bacchus and allowed the Kelsey Museum team to create a digital reconstruction of what this head might have looked like in full color.

Case Study: Marble Bacchus Head

We often think of ancient marble statuary as being colorless, but most Roman sculptures and architectural works were originally brightly painted. This marble head of Bacchus is no exception.



Left: Head of Bacchus. Marble, pigment. The image in the middle shows an application of color based on the locations of pigments found on the object's surface during examination. The image on the right is a hypothetical reconstruction of the finished surface based on similar sculptures and wall paintings. Contributors: Catherine Person, Caroline Roberts, Elaine Gazda, Nicola Barham, and Emily Pierattini.

The traces of red pigment in the hair are relatively easy to see, but we suspected there might be microscopic traces of color in other areas. To find out, we explored the surface of the head for pigment using a Dino-Lite digital microscope as well as multispectral imaging (MSI). To our surprise, we discovered a lot of color, including traces of what could be **red lead** or **cinnabar/vermillion** on the inner corner of the mouth, and **black and red pigment** along the inside of the eyes and in the tear ducts. The biggest surprise was revealed in the MSI imaging: luminescent areas of **Egyptian blue** in the garland of ivy leaves in the hair. The amount of blue was so small that we did not see it with the digital microscope (view a silent video of Carrie Roberts investigating Bacchus).

This physical evidence, along with curators Elaine Gazda's and Nicola Barham's knowledge of Roman sculpture and painting, allowed us to create this digital reconstruction of what the Bacchus head might have looked like in full color. Note: the red pigment in the hair was likely underpaint for the final color, while the blue in the leaves was likely mixed with a yellow pigment to create green.

Investigating with Light

As an important extension to the physical exhibition, the *Ancient Color* website includes lists of [online resources](#) and [bibliographic references](#) related to the use of colors in the ancient world and to the controversial issue of white antiquity. Another highlight of the website is an interactive [Color Quiz](#) that provides further information on the origin of various colors and their place in Roman culture. The website also has links to interactive in-gallery applications that showcase the production of colors and various investigative techniques in greater detail.

Credits

Exhibition curators: [Catherine Person](#) and [Caroline Roberts](#)

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