

Wall texts

GODS IN COLOR—GOLDEN EDITION

Polychromy in Antiquity

Sculptures in pure marble white —to the very present, this image still dominates our conception of European antiquity. Yet the impression is deceptive. It has its origins in the lacking or wanting knowledge of the Renaissance and its precursors, but also in the ideology of pure form deliberately propagated above all in the twentieth century. Until quite recently, both scholarly research and the general public avoided a closer look at the polychromy of Greek and Roman marble architecture and sculpture.

The question arises as to whether colorless sculpture was intended to serve as a symbol of the presumed superiority of the “white man”—in contrast to the visual-aesthetic principles of non-European cultures considered naïve on account of their use of bright colors.

The exhibition *Gods in Color—Golden Edition* presents the spectacular results of current research. At the same time, it sheds light on the rich fund of studies carried out on the polychromy of ancient sculpture back in the eighteenth and nineteenth centuries.

The *Gods in Color* have been touring the world since 2003, expanded continually by the results of new studies. In thirty cities, some three million visitors have meanwhile seen the show. Its first edition was on view here at Frankfurt’s Liebieghaus sculpture museum in 2008. Since then, the number of reconstructions has nearly tripled.

The Reconstructions

The reconstructions carried out since 1990 are all based on new research results. In keeping with the scientific findings, their polychromy consists of original historical painting materials, including:

- mineral pigments (e.g. ochre earths, green earth, copper carbonates such as azurite and malachite, vermilion)
- soot black (ivory black, vine black, bone black)
- synthetic pigments (Egyptian blue, Egyptian green, lead white, lead yellow)
- binding agents in tempera technique (egg, casein and oils)

The copies of the ancient marble sculptures were made of various materials (and all given a surface with marble content on which to apply the polychromy)

- marble
- marble dust bound in artificial resins (“artificial marble”)
- stucco marble on plaster
- stucco marble on polymethyl methacrylate (3D print on the basis of 3D scans)

The reconstructions of the ancient bronze sculptures are recasts in bronze. To this end, the originals were scanned and produced in sections as 3D prints. The sections, dipped in paraffin, then served as molds for the bronze casts. The following materials were used for the polychromy of the bronze recasts:

- liver of sulfur for the artificial patination
- bitumen lacquer (asphalt in linseed oil and oil of turpentine)

- pigments (madder lake, indigo)
- precious stones (garnet, chalcedony, citrine, quartzite, etc.)
- metal inlays (copper, silver)
- gilding and silvering

Learning from the Egyptians

The sculptures and temples of the ancient Egyptians were multicolored. Thanks to the country's dry climate, the polychromy has come down to us in excellent condition. Egypt and Greece engaged in lively exchange in both the second and first millennia BC. From the end of the second millennium onwards, the Greek culture underwent a decline. When it finally recovered around 700 BC, the politicians sent the sculptors of the land to Egypt to learn how to make large-scale stone figures. Within that context, the Egyptians not only taught their Greek pupils the techniques for shaping the stone, but also the methods of sculptural polychromy.

The Greek Funerary Statue of Phrasikleia

The marble funerary figure of Phrasikleia was discovered some fifty years ago near Athens. As we learn from the inscription on its base, Phrasikleia died in her youth, before she was married. Some fifty years after its erection—that is, around 500 BC—the precious statue was wrapped in lead foil and buried, possibly to keep it out of the hands of enemies. Because it was thus protected from environmental influences for so long, the polychromy remained in unusually good condition.

With regard to form but also coloration, the funerary figure of Phrasikleia is still entirely indebted to Egyptian art. The maiden wears a crown of lotus buds and flowers, Egyptian symbols of the cycle of death and life. On the back, a stellar constellation is found in the ornaments on her robes. The backs of Egyptian sculptures traditionally represented night and death.

Colorful Cemeteries

In ancient Greece and Rome, cemeteries lined the roads outside the gates to the cities. The grave precincts presented travelers with imagery recalling the lives of the deceased. The vivid coloration of the relief figures and the paintings on the marble steles helped passersby understand the content even at greater distances and higher speeds.

The High, Slender Funerary Stele of Aristion

When the funerary stele of Aristion was found outside Athens in 1838, the traces of its once vibrant colors were still quite well preserved. It accordingly served nineteenth-century archaeological research as important evidence of ancient statuary polychromy. The statue painter incised the lion's head into the marble surface of the armor's shoulder piece before painting it. In ancient Greece, the lion was a symbol of strength.

The Funerary Figure of a Man Who Died Young (Kouros)

Early Greek sculptors made figures of naked young men in the pose of statues of Egyptian pharaohs and erected them on graves. The Greek artists painted these early sculptures with the same colors as the Egyptians from whom they had learned the polychromy techniques. In the seventh and sixth centuries BC, the Egyptians—and thus the Greeks—depicted body hair (that is, the pubic hair, but also the eyebrows) in blue.

The reconstructions of the so-called third generation

With support from the Oliver Primavesi Leibniz Prize of 2007
(German Research Foundation)

The Liebieghaus Polychromy Research Project received substantial support from Professor Oliver Primavesi (Ludwig-Maximilians-Universität Munich). With funds from his high distinction for outstanding achievement in research, he enabled the Liebieghaus project to resume its investigations of the so-called Alexander Sarcophagus, the so-called Persian Rider from the Athenian Acropolis, the funerary figure of Phrasikleia from Attica and other important objects. His assistance made it possible to carry out expensive 3D scans of the most important testimonies to Greek statuary polychromy and replicate them with the elaborate 3D printing process. The researchers decided against the traditional casting method so as not to damage the figures' exceptionally well-preserved polychromy.

The colors of the greek sanctuaries

The Greeks and Romans had little visual imagery in their everyday lives. When they entered a large city or a rural sanctuary, however, they suddenly found themselves looking at a great abundance of colorful figures and buildings. The priests, priestesses and sacrificial slaughterers presumably also wore precious, vibrantly colored robes, especially on feast days. The sculptures of these sacred sites recount the myths of the gods and heroes to which they were dedicated. In the later period, we also encounter portraits of deserving citizens, among them philosophers and politicians. The consecrated artworks of a given sanctuary can date from many different epochs and therefore differ substantially in their manner of execution. Greek artists sought to perfect the illusion of reality: particularly the bronze sculptures were intended to surprise the visitors with their lifelike appearances. Figural polychromy was a particularly important means of achieving such realism. Yet the color schemes were also indispensable for the legibility of sculptures placed far up on temple buildings. Ornaments and clear colors were essential means of recognizing the mythological events depicted in the structures' pediments and friezes.

The West Pediment of the Temple of Aphaia on the Island of Aegina

The island of Aegina is within eyesight of Athens. In the Aeginan sanctuary of Aphaia is a temple that once boasted a wealth of sculptural decoration. Early nineteenth-century archaeologists discovered marble pediment figures there still bearing numerous traces of their original polychromy. The research carried out by the team around Vinzenz Brinkmann brought a wealth of new observations to light. These insights have made it possible to reconstruct—for example—the precious ornaments on the shirt and jacket of an Oriental archer in their entirety.

The colors of the Small Herculaneum Woman

A current research project sponsored by the Ministry of Education and Research of the Federal Republic of Germany

In collaboration with Clarissa Blume-Jung of the Ruhr-Universität Bochum, the Liebieghaus Polychromy Research Project has succeeded in reconstructing the polychromy of a famous marble statue. The so-called Small Herculaneum Woman was discovered a hundred years ago on the Greek island of Delos. The statue depicts a woman wrapping herself tightly in a mantle of the finest silk. This garment exhibits traces of both green and pink pigments, suggesting that the color scheme was intended to emphasize the transparency of the delicate fabric. Similar representations of transparent robes are found on numerous small-scale clay statues as well as in Greek and Roman painting. The precious decorations of the mantle and undergarment are visible in natural light and even more so in ultraviolet and infrared light: wave, ray

and crenellation patterns adorn the hems. The statue dates from the period around 100 BC and thus from the late period of ancient Greek artistic production. The sculptors and painters of Late Hellenism evidently had consummate mimetic—that is, realistic—depiction techniques at their disposal: the figure's forms as well as its colors are deceptively lifelike in appearance.

The colors of the Muse of Frankfurt

A current research project sponsored by the Ministry of Education and Research of the Federal Republic of Germany

A marble figure of a standing muse from a statuary group is the subject of a further current study being carried out by the Liebieghaus Polychromy Research Project with support from the Federal German Ministry of Education and Research. The group—originally consisting of nine muses, five of which have survived—was evidently first erected on the Greek island of Delos before being carried off to Italy. The muses, who are accompanied by Apollo, embody the arts of song and literature. The standing muse from the Frankfurt group still bears numerous traces of its originally rich polychromy. These traces are visible to the naked eye and all the better recognizable under ultraviolet and infrared light. When we take into account the information gained from other sculptures as well as ancient paintings, we arrive at a clear conception of the figure's polychromy. Yet because the remaining traces and attributes allow for various interpretations and deviations, we have produced three scaled-down reconstructions with different possible color schemes. The chariot frieze on the mantle and the palmette frieze on the undergarment are considered certain. Blue as the color of the decorative bands as well as pink as the hue of (at least part of) the undergarment is likewise undisputed. The complexity and richness of the garment decorations are striking and make the figure particularly precious.

The motley emperors

The stone portraits of Roman emperors were also polychrome and accordingly lifelike in appearance. A portrait of Emperor Caligula from the collection of the Ny Carlsberg Glyptotek in Copenhagen exhibits well-preserved vestiges of its polychromy. It evidently never underwent excessive cleaning, either by art dealers or by conservators. Large areas of the skin color are accordingly still intact, particularly on the left side of the neck. The black underpainting of the eyes and hair is also still easily recognizable with the naked eye. In collaboration with our Danish colleagues, the Liebieghaus team has produced four experimental reconstructions, three of which are here on display, over the course of the past fifteen years. These variants—which, like all the reconstructions, must be understood as model approximations of the originals—represent different interpretations of the surviving paint traces. They allow the viewer to judge the effect of the illusionistic techniques. Caligula (Gaius Caesar Augustus Germanicus) ruled from AD 37 to 41 and was reportedly a brutal man with a tendency towards madness. Recent research, however, has begun to question this devastating verdict that has come down to us from the authors of antiquity.

The so-called Treu Head

The Roman marble head of a female deity with exceptionally well-preserved polychromy sparked the interest of Georg Treu (1843–1921) of Dresden, the archaeologist who directed the excavation of Olympia. The British Museum in London purchased the head, but permitted Treu to study and publish it. Today, more than a hundred years after its discovery, the Treu Head still provides invaluable information, particularly about the application of the pastose layer of paint representing the skin. Large vestiges of the original paint have remained intact on the highly polished marble surface in the areas of the forehead, cheeks, mouth, chin and neck. They show that the skin color was applied as a thick layer of opaque paint rather than a thin transparent coating. We can even still discern the apricot-colored complexion with which the ancient artists endowed the goddess. In the first half of the twentieth century, scholars closed

their minds to the phenomenon of statuary polychromy—to say nothing of the existence of skin color. The head was declared a forgery and made its way into the British Museum storage rooms. We have Thorsten Opper and Giovanni Verri to thank for the recovery of this deliberately concealed treasure and the in-depth examination of its paint traces in keeping with present-day scientific standards. Our display features color studies carried out in preparation for an experimental reconstruction. The Frankfurt team is collaborating closely with scholars in London on this project.

The so-called Alexander Sarcophagus from the Royal Necropolis of Sidon

In 1887, the Turkish archaeologist (and well-known painter) Osman Hamdi Bey succeeded in excavating a huge marble sarcophagus in Sidon (in present-day Lebanon) and bringing it to the Archaeological Museum of Istanbul. The extremely elaborate reliefs covering all four of its sides depict Alexander the Great engaging in battle against the Persians and taking part in a royal hunt. The complex painted decoration of these reliefs is in exceptionally good condition and offers insights into the style and technique of Greek statuary polychromy at the beginning of Hellenism (ca. 320 BC). The artists enhanced the figures, for example, with a uniform mode of representing light and shade otherwise found only in two-dimensional paintings. Some elements are only painted on. Highlights and shading nevertheless lend them the illusion of three-dimensionality. The Frankfurt research project has meanwhile carried out several examinations of the sarcophagus. Measurements of the color values by means of ultraviolet-visible absorption spectroscopy have brought more than twenty different pigments to light. Even the naked skin was painted with a mixture of several pigments. However, we have only been able to identify madder lake with certainty. On the three versions of the head of a Persian on display here, the flesh color consists of madder lake mixed with different pigments in each case.

The colorful gods from Pompeii

Already in the late phase of Greek culture (ca. 100 BC), wealthy citizens developed a new form of private luxury. In the courtyards and gardens of their imposing private homes, they erected (often downscaled) copies of famous statues. There is ample evidence of this form of prestige object in the ancient residential areas destroyed by the eruption of Mt Vesuvius in AD 79. Within hours, Pompeii was buried under a layer of ash and lava several meters high. For the inhabitants, the occurrence was fatal—but it kept the colors of the marble sculptures erected in the villas ‘alive’. Through our cooperation with the project “MannInColours” at the Museo Archeologico Nazionale di Napoli, we have the opportunity to show three prominent statue finds from Pompeii—two figures of Aphrodite and one of Artemis—here in Frankfurt. The famous statue group of the so-called Bikini Venus shows the goddess of love with the little boy Eros. She is leaning on a statue of Priapos, the god of fertility, whose erect member has been lost. The sensitive gilded areas decorating the bustier of Venus, but also Priapos’ genitals, are in exceptionally good condition. The so-called Lovatelli Venus—one of the few ancient marble sculptures whose colors have survived almost completely intact—is of similar importance for the study of ancient statuary polychromy. This statue group has undergone examination within the framework of both the Liebieghaus Polychromy Research Project and “MannInColours”. An experimental reconstruction is presently being carried out on the basis of the results.

Johann Joachim Winckelmann

The discoverer of ancient statuary polychromy

Johann Joachim Winckelmann (1717–1768), the founder of art history, is today erroneously understood as a defender of whitemarble antiquity. In 1762, however, he had the opportunity to view marble sculptures newly discovered in Pompeii. The numerous vivid traces of paint on these statues did not escape his

notice. In his magnum opus *The History of Art in Antiquity*, he addressed himself repeatedly to the phenomenon of color in ancient sculpture.

Winckelmann provided a detailed description of the surviving vestiges of paint on a smaller-than-life-sized marble figure of Artemis, the goddess of the hunt. The first investigator and excavator of the ancient city of Pompeii, Camillo Paderni (ca. 1715–1781), had likewise conscientiously made notes on these traces, also pointing out the existence of skin color on the Artemis. Within the framework of the Oliver Primavesi Leibniz Prize project in 2007, the Frankfurt research team reexamined the figure. They discovered that the color remnants observed by Winckelmann and Paderni are still extant today. Thanks to this circumstance, they were able to identify exactly which color materials the original artists had used, and reconstruct the statue based on that information.

Materials and techniques of statuary polychromy

Interregional trade united the ancient cultures of Asia, Africa and Europe. Precious pigments and colorants for painting sculptures were among the goods exchanged. No efforts were spared to offer the highest possible quality in natural materials. Vivid and luminous minerals, earths, colored lacquers, gemstones and precious metals were especially rare, expensive and in demand. Intense colors accordingly always lent the garments of people and sculptures alike a certain preciousness that could be further enhanced with gold and gemstones. In addition to the natural pigments, artificial pigments were already being developed as early as the third millennium BC, for example Egyptian blue and Egyptian green, which were manufactured from fired glass frit. These sophisticated techniques fell into oblivion, however, in the European Middle Ages. Only the finest marble was used for stone sculptures—marble that was completely white, fine-grained and free of inclusions. It was smoothed, not only making the colors durable but also offering the fine brush hairs a perfect painting surface. The artists usually mixed and applied the pigments and colored lacquers in tempera technique. Their binder mediums consisted of egg or casein, often in combination with linseed oil and resins. Even today, well-processed and thoroughly dry tempera is considered the most stable paint. To achieve the effect of color in bronze sculptures, the polychromists availed themselves of different-colored metals such as bronze, copper, silver and gold. Artificial patination—that is, the treatment of the surface with chemicals—can lend bronze and copper an intense red, purple, blue or green hue. Precious stones and colored glass were also used, for example to give eyes a lifelike gaze. In some cases, the eyes of stone sculptures were also made of gemstone or glass inlays.

Churches in color, saints in color

The coloration of Christian churches and the polychromy of their sculptural decorations are indebted to the tradition of ancient Greek and Roman art. This is true of the entire European Middle Ages—it was not until the fifteenth century and the Italian Renaissance that these forms of decoration began to lose currency. The academies of that era demanded figures in white marble and black-patinated bronze instead. The new development presumably made its way across the Alps, prompting the famous sculptor Tilman Riemenschneider, for example, to leave some of his works unpainted. Yet there were provenly also cases of medieval sculptures that never received a polychrome finish. At the entrance to this room is a large figure of St George made of oak. As we know from historical documents, this sculpture remained unpainted after its carving. Thanks to the continuity of the Christian cult to the very present, the colors of the Middle Ages have been relatively well preserved. What is more, many medieval sculptures were repainted in later times, for example in the Baroque. The research on Greek and Roman statuary polychromy profits from the more extensive knowledge of the coloration of medieval, but also Baroque sculpture. One successful strategy, for instance, has been to search specifically for techniques of Christian polychromy—the lustre technique, methods of painting flesh tones, gold sequins, etc.—in European antiquity.

The color temples of antiquity

The ancient Greeks and Romans constructed their buildings of wood, limestone or marble. Vibrant coloration always played a central role. Wood and limestone were coated with the finest marble stucco in preparation for painting. Where the construction material was marble, the paint was applied directly to the stone. In numerous cases, the polychromy of temples and columned halls has come down to us in good condition. As a result, we know that the area above the columns was completely decorated with rich and colorful ornamentation. Greek column capitals found in Athens and Egypt provide clear evidence that the capitals of the Ionic and Corinthian orders were likewise painted with vivid colors. Whether or not the simple capitals of the Doric order were polychrome has remained a matter of scholarly dispute to this day. Gottfried Semper, however—the architect of the Dresden Opera House,—observed traces of color on the Doric capitals of the so-called Theseus Temple in Athens. His reconstruction of a Doric capital was adopted repeatedly in the nineteenth century. The famous architecture historian Josef Durm had a cast of a capital decorated in color according to Semper's conception. Around 1900, this reconstruction served students as an illustration. The question of whether even the column shafts were coated with paint has yet to be answered.

Nineteenth-century research into the polychromy of ancient sculpture

The architects of the nineteenth century sought to copy European antiquity as faithfully as possible. Within that context, the matter of color in Greek and Roman architecture took on key significance. Jacques Ignace Hittorff, Gottfried Semper, Leo von Klenze and others traveled Southern Europe in search of the ancient colors. They all returned to their native countries with unequivocal evidence of the extensive polychromy of architecture and sculpture and sparked public discussion with their finds. The archaeologists at universities—the first to carry out scientific excavations—likewise gained many new insights into the polychromy of ancient art. When excavations on the Athenian Acropolis brought numerous fragments of colored sculpture and architecture to light at the end of the nineteenth century, the last remaining skeptics fell silent. Around 1900, the Swiss artist Émile Gilliéron père took it upon himself to document the traces of paint on the newly found objects in watercolor and gouache drawings. At the time, the city of Frankfurt financed the publication of the early marble sculptures on the Athenian Acropolis. Thanks to that circumstance, the Liebieghaus Skulpturensammlung came into the possession of six watercolors by Gilliéron.

Colorful Middle Ages

A polychrome finish—Fassung in German—was the rule for medieval sculptures. For the most part, the latter were polychromed entirely; only rarely was the finish monochrome. Some special materials for sculptures were only partially painted. Medieval sculptures still featuring their original polychromy (or at least remnants thereof) have come down to us in large numbers. Aging, damage, overpainting and other changes, however, have frequently obscured the aesthetic impact of the color scheme. Current research into the polychromy of medieval sculpture focuses primarily on the techniques used and the intended optical effects. Sadly, knowledge of the historical methods and materials has largely been lost, and the original written sources are often unclear. Even where scientific analyses provide us with precise insights into the painting mediums, this information tells us little about how the paints were employed. Many questions regarding technique remain unanswered, for example regarding the application, the specific properties of the binding agent or the precise ratios of the different components of a painting medium. Here experimental reconstruction can be very helpful. As in the research on the polychromy of ancient Greek and Roman sculpture, practical experimentation has proven a successful means of coming to a better understanding of the ways and means of medieval polychromy. Taking all available information into account, various methods are tested with regard to their practicability and their effect, and the results

carefully compared to the original. The aim is to come as close to the original as possible with regard to both execution and appearance, and to gain a new perspective on the medieval painting techniques.

Gods in black and white: The sculptures of the Italian Renaissance

Leonardo da Vinci considered sculpture inferior to painting because, lacking color, it was incapable of expressing feelings. This assessment is all the more astonishing when we recall that, during his lifetime, the great artist was virtually surrounded by medieval sculptures with polychrome finishes that depicted grief, for example, with eyes painted accordingly and, in extreme cases, even glass appliqués representing tears. In Leonardo's day, however, every effort was being made to establish a new ideal. The intellectual confines of the Middle Ages were to be countered with the humanist values of Greek and Roman antiquity. And ancient stone and bronze sculptures—erroneously thought of as marble white or patinated black—were considered an expression of those values. The colorless sculpture whose form and content were adopted from antiquity thus served as a symbol of intellectual and formal renewal. The downscaled replica of the Apollo Belvedere by the famous sculptor Pier Jacopo Alari Bonacolsi (1460–1528), called Antico, is on display at the center of this room. Its model was a Roman marble copy of a lost Greek original that had been made of bronze. Although Antico reduced to coloration to black patina and gilding—after what he erroneously believed to be the manner of antiquity—he succeeded in filling the figure of the god Apollo with new life.