Ancient technology for metal coatings 2,000 years ago can't be matched even today

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Artists and craftsmen more than 2,000 years ago developed thin-film coating technology unrivaled even by today's standards for producing DVDs, solar cells, electronic devices and other products. Understanding these sophisticated metal-plating techniques from ancient times, described in the ACS journal Accounts of Chemical Research, could help preserve priceless artistic and other treasures from the past.

Gabriel Maria Ingo and colleagues point out that scientists have made good progress in understanding the chemistry of many ancient artistic and other artifacts — crucial to preserve them for future generations. Big gaps in knowledge remained, however, about how gilders in the Dark Ages and other periods applied such lustrous, impressively uniform films of gold or silver to intricate objects. Ingo's team set out to apply the newest analytical techniques to uncover the ancients' artistic secrets.

They discovered that gold- and silversmiths 2,000 years ago developed a variety of techniques, including using mercury like a glue to apply thin films of metals to statues and other objects. Sometimes, the technology was used to apply real gold and silver. It also was used fraudulently, to make cheap metal statues that look like solid gold or silver. The scientists say that their findings confirm "the high level of competence reached by the artists and craftsmen of these ancient periods who produced objects of an artistic quality that could not be bettered in ancient times and has not yet been reached in modern ones."

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