

The making of medieval bling

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A new study unravels how medieval artisans embellished textiles with gold.
Credit: The American Chemical Society

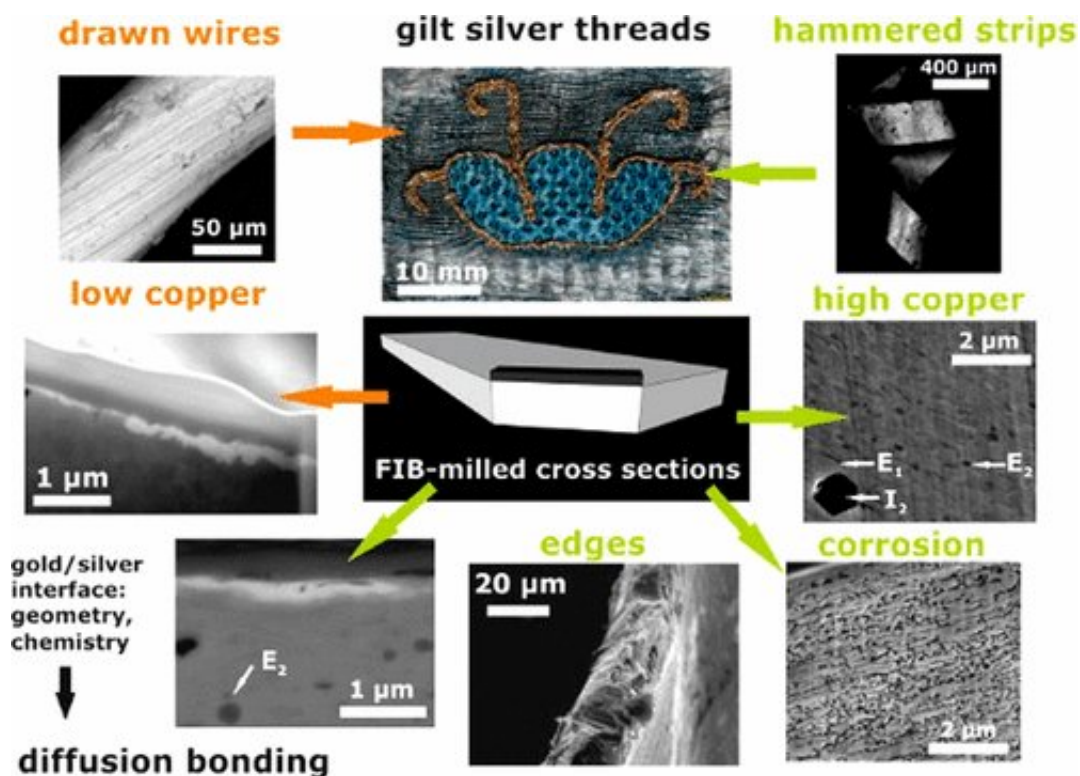
Gold has long been valued for its luxurious glitter and hue, and threads of the gleaming metal have graced clothing and tapestries for centuries. Determining how artisans accomplished these adornments in the distant

past can help scientists restore, preserve and date artifacts, but solutions to these puzzles have been elusive. Now scientists, reporting in ACS' journal *Analytical Chemistry*, have revealed that medieval artisans used a gilding technology that has endured for centuries.

Researchers can learn a lot about vanished cultures from objects left behind. But one detail that has escaped understanding has been the manufacturing method of gold-coated silver threads found in textiles from the Middle Ages. Four decades of intensive research yielded some clues, but the findings have been very limited. Study of the materials has been hindered by their extremely small size: A single metal thread is sometimes only as thick as a human hair, and the thickness of its [gold coating](#) is a hundredth of that. Tamás G. Weiszbürg, Katalin Gherdán and colleagues set out to fill this gap.

Using a suite of lab techniques, the researchers examined medieval gilded silver threads, and silver and gold strips produced during and after the Middle Ages. The items come from European cultures spanning the 13th to 17th centuries. The researchers characterized the chemistry of the silver [thread](#), its gold coating, the interactions between the two and the shape of metal strips' edges. To characterize the threads and strips, the researchers combined high-resolution scanning electron microscopy, electron back-scattered diffraction with energy-dispersive electron probe microanalysis and other analytical methods.

Though previous studies indicated that these tiny objects were manufactured by a mercury-based method in fashion at that time, the new results suggest that the threads were gilded exclusively by using an ancient method that survived for a millennium. The goldsmiths simply heated and hammered the [silver](#) sheets and the [gold](#) foil together, and then cut them into strips. It was also possible to determine whether scissor- or knife-like tools were used for cutting. The results also show that this process was used widely in the region well into the 17th century.



Credit: American Chemical Society

More information: Tamás G. Weiszbürg et al. Medieval Gilding Technology of Historical Metal Threads Revealed by Electron Optical and Micro-Raman Spectroscopic Study of Focused Ion Beam-Milled Cross Sections, *Analytical Chemistry* (2017). [DOI: 10.1021/acs.analchem.7b01917](https://doi.org/10.1021/acs.analchem.7b01917)

Provided by American Chemical Society

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