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Official or Illegal? Tomographic analysis of plated silver coins from Ancient Greece.

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The first coins were made of electrum and were minted during the 7th century BC in Lydia (Asia Minor). Plated electrum coins began to appear soon after, and these have usually been identified as privately manufactured 'fakes'. But it is possible that they were in fact produced in the state's own mint. The art of plating coins required a very high skill level. Attaching a thin piece of electrum over another metal (silver was the preferred core at this time) required a high degree of metallurgical knowledge and practical skills. The Australian Centre for Neutron Scattering has been involved in a study with the Australian Centre for Ancient Numismatic Studies at Macquarie University since 2014. A number of plated coins have been studied using a combination of Neutron Tomography, Diffraction and Texture Measurement, as well as SEM and X-Ray Tomography. Our study also includes later ancient silver that can now be shown to be plated. The project has explored the thickness of the plating layer, porosity in the metals, and the presence of intermediate layers. Silver plating layers of 0.4mm are common and gold leaf layers of less than 0.1mm over a silver core have been studied.

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