The Man in the Ancient Bronze Mirror

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UCLA/ Getty Conservation ‘18

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Gallery
Tang Dynasty (618-907 CE)

Before Treatment

After Treatment

Front

SC 295

Graham no. 96 (M63)

MET 25.20.3

MFA Boston 08.462

MFA Boston 50.2089

MFA Boston 50.2092

MFA Boston 50.2088

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Alloy (pXRF)

- Leaded tin bronze
- No zinc or arsenic
- Trace amounts of Fe, Ag and Sb

Typical Tang bronze mirror alloy = 66-78% Cu, 18-26% Sn, and 1-9% Pb

Casting (X-radiography)

- Uneven, vertical wax casting
  Good quality mirrors from early dynasties through at least the Tang were horizontally cast and very uniform

Corrosion (PLM & ideally metallographic x-section)

- Malachite ‘pit’

Spongy, dendritic shrinkage, cracks and hot tears

PLM microscopy, Olympus BX51 at 50x
Mercury (Xuan Xi)

Only the mirror side has a very small pXRF signal for mercury. This may be evidence of a non-plating mirror shining technique called Xuan Xi which deposited a minute amount of tin-mercury amalgam on the surface of the metal.

Bruker Tracer SD-III, 900 seconds, at 40kV, 11µA, with a 1 mil Al/1 mil Ti/1 mil Cu filter, analyzed with S1PXRF 3.8.3 from Bruker Instruments.
Earliest bronze mirror dated to approx. 2000BCE

Zenith in Han-Tang Dynasties

Song style = more figurative & use of lines similar to SC295

Hight of interest in replicating earlier mirrors, especially Han-Tang periods

Casting becomes less precise and often in vertical clay molds

Brass (Cu and Zn) becomes common

Composition changes drastically (drop in Cu until mid Ming) - most in archaeological record heavily corroded

Traditional mirrors replaced with glass
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Thank you!

(Admonitions Scroll, Tang Dynasty British Museum 1903,04080,1)