



TWO ELECTRUM STATERS

Scholars debate when and where these lovely Greek coins

depicting a graceful horse were struck.

THE FOCUS of this column is two Greek *staters* bearing a horse's head on the obverse. No one knows for certain when or where they were struck, why they were made of electrum or how they were used, but numismatists have long speculated about coins similar to these —pieces that date nearly to the beginning of coinage itself. A friend and classics professor once told me privately, "No one really knows about the ancient world, so you can say whatever you want." But if we choose to stay within the boundaries of reason, what can be said about these two coins and others like them?

The staters in question are beautiful examples of ancient art (or art from any period, for that matter). The equine protome (an adornment in the form of an animal head or human bust) exhibits

a slender head, flared nostrils, open mouth and a luxuriant mane that imparts a sense of motion. The horse is bridled and harnessed for action. Barely discernable on the first of the two coins is a lotus flower above the horse's back. The sunburst to the left of the horse's chest and the morning-opening lotus are apt symbols for bright, white-gold coins.

The coins' obverse die was created in a manner similar to relatively modern issues. However, the flan was driven into the obverse die not by the reverse die, but with three punches. On the two coins, the punch orientation is consistent. (Based on the photographic plates in Liselotte Weidauer's *Probleme der frühen Electronprägung*, this was the usual case.)

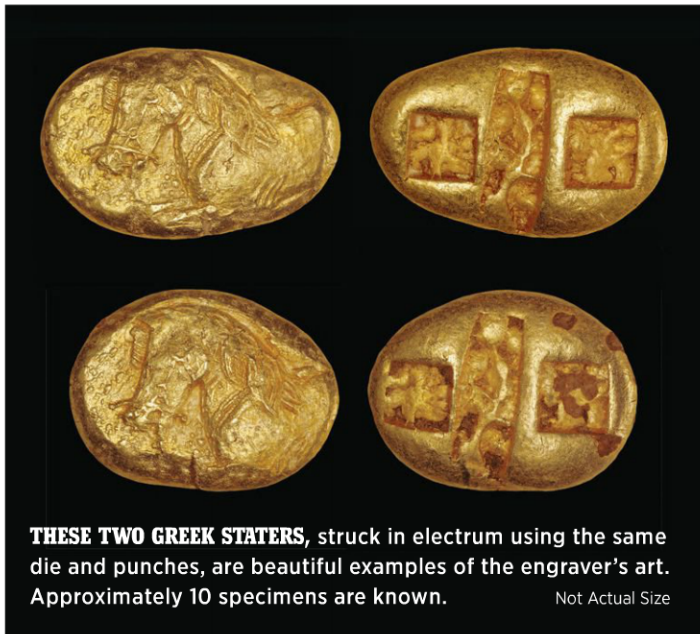
Contemporary literature hardly mentions the earliest coinage; a sentence in Herodotus' *Histories* appears to be the only reference. He wrote that the Lydians were the "first people to strike coins of gold and of silver." By that, Herodotus surely meant a bimetallic currency, not a mixture of the two metals. ("Electrum" and "white gold" were known at the time and were called such.) Since the Lydians had produced electrum coinage before their bimetallic issues, the

implication is that Greek electrum or white-gold coins predated them.

A British Museum archeological expedition led by David Hogarth in 1904-05 published its findings in 1908 as "Excavations at Ephesus/The Archaic Artemisia." The excavation unearthed a group of electrum coins in the oldest part of the ruins of Artemis' temple, the Artemision.

The specimens were examined by Barclay Head, a numismatic curator at the British Museum. He and expedition members concluded that the oldest coins dated from the first quarter of the 7th century B.C. Their reasoning was that the oldest temple, in which the coins were found, was destroyed during a Kimmerian invasion around 650 B.C. As temples were not built quickly, and this one had stood for some time, construction probably began more than a generation before 650 B.C. The coins were "donatives," buried at the start of the project within what would be the temple's walls.

Many arguments, not all polite, have ensued about the original dating of the find, with some scholars bringing it forward a century, some accepting it and some taking a middle ground. In *Greek Coins* (1933), C.T. Seltman stated the horse protome staters and other early electrum issues were struck between 690 and 630 B.C. In 1951 E.S.G. Robinson took a different view in "The Coins from the Ephesian Artemision Reconsidered," published in the *Journal of Hellenistic Studies*, and in the 1956 issue of *Numismatic Chronicle*, published annually by the



PHOTOS: JOHN NEBEL

THESE TWO GREEK STATERS, struck in electrum using the same die and punches, are beautiful examples of the engraver's art. Approximately 10 specimens are known. Not Actual Size



Royal Numismatic Society, Robinson explicitly disagreed with Seltman's dating. By that time, the latter's book was in its second edition, but the author had since died and couldn't defend himself.

In her extensive study of electrum coins published in 1975, Weidauer attributed the coins to an earlier time. The following year, M.J. Price wrote in *Numismatic Chronicle*, "This reviewer finds [Weidauer's] conclusions unacceptable." Yale Professor Donald Kagan, in his well-constructed 1982 paper "The Dates of the Earliest Coins," supported the original dating and specifically Weidauer's work, which he believed was an unjustly ignored milestone. In 1983 Price reaffirmed his stand in "Thoughts on the Beginnings of Coinage" in *Studies in Numismatic Method, Presented to Philip Grierson*, published by Cambridge University Press.

Very recently, Koray Konuk has supported a middle to early dating in his chapter "Asia Minor to the

Ionian Revolt" in the 2012 *Oxford Handbook of Greek and Roman Coinage*: "It appears that in the light of the latest stratigraphical evidence from Artemisium, the middle dating should gain further support, with perhaps an adjustment on the upside of a decade or two."

A reasonable date for the two "Horsies" considered in the various arguments is the 7th century B.C. One could do worse than cast their lot with Seltman, Weidauer and Kagan.

For years, it had been thought that electrum coins were made from naturally occurring metal, but recent studies show this is not true. The coins' composition was a controlled mixture of gold and silver, with some copper added for color and hardness. Doubting the ancient Greeks' understanding of copper as a hardness enhancer, John Healy wrote in his 1980 chapter "Greek White Gold and Electrum" in *Metallurgy in Numismatics* that the ancient Greeks understood metallurgy enough to control purity, but

it was, in effect, a lucky accident that copper made the coins hard.

The metal content of the two horse staters shown here was determined using an x-ray fluorescence analyzer (courtesy of Hallenbeck Coin Gallery in Colorado Springs, Colorado). The first piece, weighing 14.23g, was 42.92-percent gold, 55.03-percent silver, 1.58-percent copper and .47-percent nickel. The second specimen, weighing 14.26g, was 41.51-percent gold, 56.33-percent silver, 1.57-percent copper, .43-percent nickel and .15-percent lead.

X-ray fluorescence provides an accurate, nondestructive analysis of a coin's surface composition, although non-noble metals, such as copper, can leach out while buried, or the surface can become contaminated. In their excellent, wide-ranging 2001 paper "Analyzing and Interpreting the Metallurgy of Early Electrum Coins" in *Hack-silber to Coinage*, Paul Keyser and David Clark describe the presence of lead in an ancient Greek silver

alloy as indicative of a man-made alloy, as lead rarely is found in natural electrum, but typically is present in refined Greek silver.

If we take the x-ray fluorescence results at face value, the differing metallic compositions of the two coins indicate they were produced from separate batches of man-made alloy. The close agreement of the percentages indicates the compositions were controlled, as would be expected from the metallurgical references. (The weights also are quite similar.) Because of the copper-hardened alloy, the relief is slightly flat and the flan is cracked.

Other ancient electrum issues had different metallic compositions than these coins, notably a higher or lower gold content, so the question arises as to whether the Greeks could accurately gauge relative values with regard to gold content. If they could, then a coin's type could determine its value in trade. In his aforementioned article, Healy discussed his experiments with measuring gold content using a touchstone, an ancient technique in which gold samples rubbed against a black, silica-rich stone tablet leave streaks of different colors according to the metals' purity. For coins with a 50- to 75-percent gold content (typical of electrum), the results were surprisingly accurate; for example, an electrum coin that contained 60.8-percent gold was measured as 64.5 percent, 64.5 percent, 66.5 percent and 54 percent by four touchstone operators.

The cities of Ephesus and Miletus have been proposed as the source of the two horse staters. Author Michael Mitchiner, in his 2004 reference *Ancient Trade and Early Coinage*, favors Ephesus, as the pieces are similar to coins of supposed Ephesian origin. Seltman in *Greek Coins*, and Colin M. Kraay in *Archaic and Classical Greek Coins* (1976) believe the mint was located in Miletus. Based on W.K.C. Guthrie's *History of Greek*

Philosophy (2003), the latter city is a likely choice for two reasons: Miletus had 45 colonies, and it was a center of learning—the birthplace of Greek philosophy. The colonies provided natural trading partners, while the city's commercial activity encouraged development of a very early coinage (and, as an intellectual center, it had the means to do so).

In his paper, "A Quantitative Approach to the Beginnings of Coinage," presented at the 2012 "White Gold" conference in Jerusalem, François Velde of the Federal Reserve Bank of Chicago analyzed how electrum money was used. Issues ranged in size from a 14g stater (a year's salary for an unskilled laborer) to a .14g $\frac{1}{96}$ th stater. (An even smaller $\frac{1}{192}$ th stater denomination also likely existed.) An ox could be bought for little more than a stater; a $\frac{1}{96}$ th stater would buy a few days' supply of barley for a family of four.

As the values of the seven or eight electrum denominations facilitated a wide range of purchases, they were practical for commerce—so practical that an immense number of coins were produced. François de Callataÿ, in his 2013 article in *ANS Magazine*, "White Gold: An Enigmatic Start to Greek Coinage," estimated a conservative six surviving coins per die and posits that 500 dies were used to strike the coins in Velde's 3,000-coin database. Taking de Callataÿ's suggestion that Velde cataloged half the surviving electrum specimens, and extrapolating by 10,000 coins per die, this yields a probable 10 million coins, an astounding number for the Western world's first coinages. (Evidently, coins were a wildly popular invention!)

This pair of 2,500-year-old electrum horses have dutifully pulled us through the curtain of time to glimpse the early history of coinage—truly an extraordinary accomplishment!

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Further Reading

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