

Illustration

Confusing the Issue

In what follows I present a few finds that caused some confusion of the issue "history of metals", at least as far as I'm concerned. [This link](#) gets you to a module where the particular kind of confusion that museums like to impart is discussed in some detail.

The good news are [here!](#)

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| "The site (Çayönü) provided the archaeological world with several 'first's' including animal husbandry, woven cloth, smelted copper, ..." Well - no! It was native copper. |
| "Metallurgy: Çayönü is believed to have been the main bead producing centre during the early-Neolithic period. Archaeologists discovered four early copper items at Çayönü, dated at 7,200 BC - two pins, one bent fish-hook and a reamer or awl - showing that its inhabitants were already proficient at this time. Çayönü is the location of the earliest known hammered copper objects, (craftsmen produced oval-shaped copper beads) and smelted copper and bronze objects for at least 7,000 years." |

Source: Ancient-wisdom: "Exploring The Frontiers of Prehistory Internet site" (generally a good site!)

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| OTHER CAST OBJECTS 187 For although it is proper to refer to the material as wrought iron (i.e., not cast), it has been demonstrated that each sword and its added units were hand forged and not cast , although molds were probably used | Description of the Luristan sword in the Metropolitan Museum in the authoritative book of Muscarella . It is stressed several times that the object is not cast - but the entry is in the chapter " Other Cast Objects !" |
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| <small>Most placer gold is in tiny flakes that can be consolidated only by melting. The melting point of gold is 1064°C, well above the temperature of an open fire (Rehder 2000), so forced air—delivered by lung power through blowpipes or by bellows through tuyères (ceramic or stone tubes)—and ceramic crucibles would be essential (Craddock 1995). These technolo-</small> | Gold can be consolidated far easier and at low temperatures! |
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Source: D. Killick and T. Fern: Archeometallurg: "The Study of Preindustrial Mining and Metallurgy"; Annu. Rev: Anthropol. 41 (2012) p. 559 - 575. Otherwise a very informative review about archeometallurgy.

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| Çatal Höyük "Between 1961 and 1965 the British archeologist James Mellaart dug out an area in the south-west of the mound. He unearthed the remains of 160 settlements. In 1965 his digging was terminated because the Turkish authorities revoked his license based on his purported involvement into the Dorak affair. Some preliminary reports and a kind of popular-science book exist about his findings. An exhaustive publication about his findings and results has not yet been issued. " | This is not uncommon in archeological circles. Writing an exhaustive report is not only time-consuming and boring, worse, it gives your opponents material to attack your with. It's far easier to promote your specific point of view if only you have access to all data. James Mellaart, by the way, did have a peculiar and controversial point of view about how archeology should be conducted. I'm not saying that his point of view was right or wrong - I don't know - but that he viewed Çatal Höyük as an opportunity to prove it. This is dangerous. As the saying goes: "if your only tool is a hammer, you tend to see every problem as a nail". This kind of (unscientific) behavior did produce some confusion about Çatal Höyük . |
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Source: German version of the Çatal Höyük Wikipedia article; translated by me

Varna

The excavations of what became known as the Varna I cemetery continued into the 1990s but a *full publication of the site and its archaeological finds is still awaited.*

See above.

It is rather difficult to find anything about the making of the Varna gold and copper objects

Source: John Chapman, Tom Higham, Vladimir Slavchev, Bisserka Gaydarska and Noah Honch: The Social Context of the Emergence, Development and Abandonment of the Varna Cemetery, Bulgaria European Journal of Archaeology 2006 9: 159

Often cited as the first copper artifact is a pierced oval pendant found in the Shanidar Cave in the Zagros Mountains and dating to the ninth millennium B.C. (Solecki 1969).

The pendant has never been analyzed, but it appears to have been ground rather than hammered, making it more likely to be a piece of malachite rather than copper. The ear-

Source: [Tamara Stech](#) I'm sure that Tamara Stech is right. She also suspected that those "lead" beads from Çatal Höyük could not possibly be lead - see above - before that was proved.

"Çatal Höyük is important in terms of the history of metal because the site has yielded copper and *lead* artifacts dated about 6000 BC. The copper had apparently been hammered into little plates and used to decorate the edge of a piece of cloth, and the lead had been made into 13 beads strung on a necklace."

No, it hasn't yielded lead artifacts!

"Çatal Höyük" in the *English* 2013 Wikipedia page! The German one got it right (of course)

exploitation of one particular metallic resource—native copper. This is not to say that the archaeological record does not contain evidence for the manipulation of other metals, like gold (Hickey 1996, 3–5), silver (Brose and Greber 1979a, 253; Spence and Fryer 2005), lead (primarily in the form of galena; Walthall et al. 1979; Walthall 1981) and meteoric

Lead in the form of galena? How about sulfur in the form of galena? Or iron in the form of pyrite?

Source: K. L. Ehrhardt: "Copper working technologies..." J World Prehist. 22 (2009!!!) p. 213

OBSIDIAN, TRADE AND SOCIETY IN THE CENTRAL ANATOLIAN NEOLITHIC
A Master's Thesis
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A long and learned treatise, much of it about Asikli Höyük. That's where one would expect to learn all about the [amazing obsidian bracelet](#) found there, right?
Nope. It is not mentioned at all.

"Melting before smelting" - witness *cast* mace head from Can Hasan

That mace head was hammered into shape!

Source: Forgot

To *melt* copper out the rock it is necessary to keep a fire at least 1981°F (1083°C). This was most likely done in ancient Copper Age sites by continuously blowing a fire through tubes made from wood, bamboo or reeds

You do not melt copper out the rock, you *smelt* it, i.e. *reduce* copper oxide or whatever. Just being very hot won't do the trick!

You certainly do *not* add arsenic to a proper mixture of copper - tin!

Scientists believe, the heat required to melt copper and tin into bronze was created by fires in enclosed ovens outfitted with tubes that men blew into to stoke the fire. Before the metals were placed in the fire, they were crushed with stone pestles and then mixed with *arsenic* to lower the melting temperature. Bronze weapons were fashioned by pouring the molten mixture (approximately three parts copper and one part tin) into stone molds.

I realize that it is hard to compress complex stuff into short texts but this site is supposed to give *facts* and *details*.

Source: COPPER AGE, BRONZE AGE AND IRON AGE - Facts and Details
<http://factsanddetails.com/>

Die erste Verhüttung von Kupfererz fand vermutlich zufällig statt. Man nimmt an, daß gelegentlich Erzstücke in Töpferöfen gerieten, die seit etwa 7000 v. Chr. bekannt sind. Bald darauf wurde bergmännisch abgebautes Kupferz bei Temperaturen von mehr als 1080 Grad Celsius geschmolzen und mit tönernen Gußtiegeln aus dem Schmelzofen geholt.
 (... *mined ore was molten at temperatures above 1080 °C and taken out of the melting furnace in ceramic pouring vessels*)

See above

Source: Science author Ernst Probst: "Rekorde der Urmenschen" (Records of Prehistoric men)

The Good News

Archeometallurgy is finally taking over the literature about the history of metals. In recent years more and more books relating to the history of metals appear that get things right, or at least discuss remaining uncertainties.

I cannot mention all of them, especially not the ones I don't even know about. Here are a few random samples:

The Archeometallurgy of the Asian Old World

Vincent C. Pigott ; Editor
 University Museum Monograph 89
 Uni Pennsylvania 1999

Contains 7 articles, one from Tamara Stech, always a good source.

The Archeometallurgy of Copper

Andreas Hauptmann
Springer, 2007

The book is first of all a compilation of data about copper archeometallurgy gained from major digs in the area of Faynan (Jordan). It also discusses in detail the development of copper technology from the very beginning and relates about everything that is known about the topic.

The book is written for scientists and not all that easy to read.

The Mastery and Uses of Fire in Antiquity

J. E. Rehder
 McGill-Queen's University Press

A real eye opener!