

Early Places With Metals:

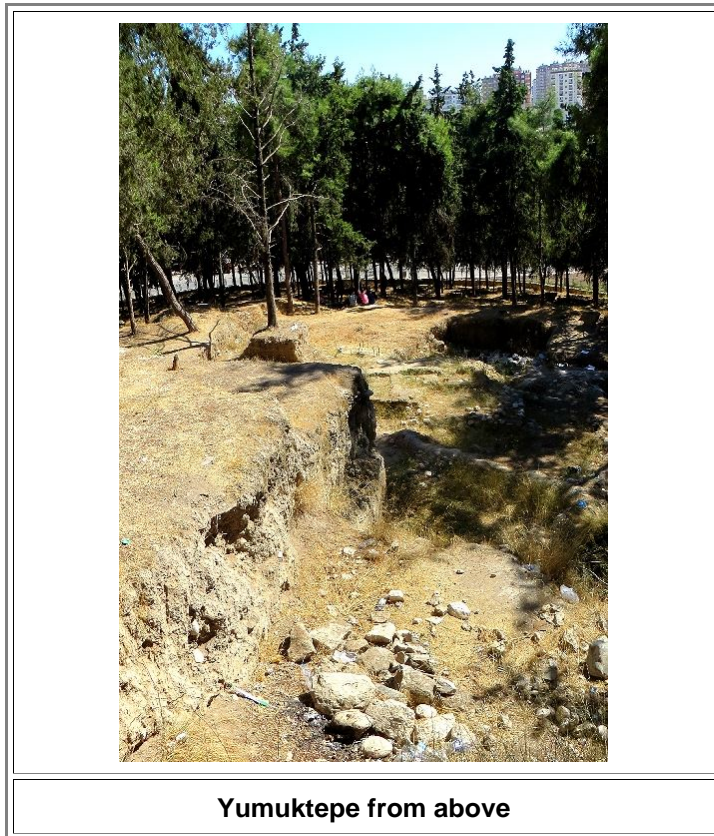
Yumuktepe

Advanced

Yumuktepe is a **tell** or ruin mound right in the thriving city of **Mersin** in Southern Turkey. It raised itself by continued settlements since 7000 BC until the Middle Ages. Yumuktepe was close to the coast when the first people settled there. Now it is about a mile inland.

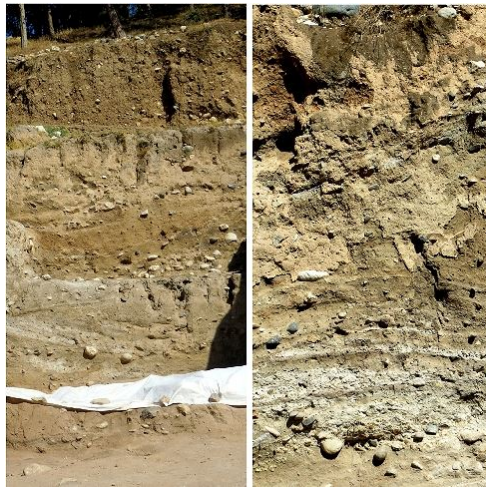
Yumuktepe thus is far younger than the other old settlements covered in this module (look at the [time line](#) to get an idea). Its present claim to fame is that so far it yielded the **oldest smelted copper** known to archeometallurgists.

I visited Yumuktepe in Sept. 2013. While I can't give you a picture of the "oldest smelted copper", I can give you a vague idea of what "finding" up to 9000 year old things actually entails: long and hard physical work after a long and dedicated study of the scientific background.



Looking down from the hill top we see the remains of trench dug by the British archaeologist John Garstang in 1937 - 40 and 1947 - 48. John distinguished 33 different cultural levels. While his "stratigraphy" has been augmented and differentiated in more recent times, it is generally correct and still used. The lowest and thus oldest level (No. I) has meanwhile been [carbon dated](#) to about 7000 BC, the No. XXXIII top level is from the Middle Ages. Archeologists give numbers in Roman numerals, of course!

What some of these levels look like can be seen here:



The "layers" of Yumuktepe

[Large size picture](#)

- It is not all that easy to make sense of what you see in such a vertical cut. Personally, I have no idea of what one can see in those pictures, except that the weighted-down plastic coverlet in the left-hand picture signals that this is a "live" excavation and that you should not touch anything.

Indeed, since 2000 **Isabella Caneva** of the University of Salento / Italy resumed digging, and some of what I'm recounting here is from Isabella Caneva's article about the subject [1](#) and [Ünsal Yalçın's article](#) about the copper investigations.

What you might see under one of those plastic covers is something like this:



A pot and some shards "in-situ".

[Large size picture](#)

- ▣ What you don't see are metal artifacts. First, there are far fewer of those in the mound than pot shards, and second, you have to sift through a lot of dirt and look rather closely to find one. Small copper needles or beads don't look like much since they are heavily corroded and mud-encrusted. Not very impressive. That's probably also why old metal things are not displayed in the Mersin museum (or in most other museums I know of).

Here are objects from Yumuktepe that are displayed in the Mersin museum:



About half of the Yumuktepe objects displayed in the Mersin museum



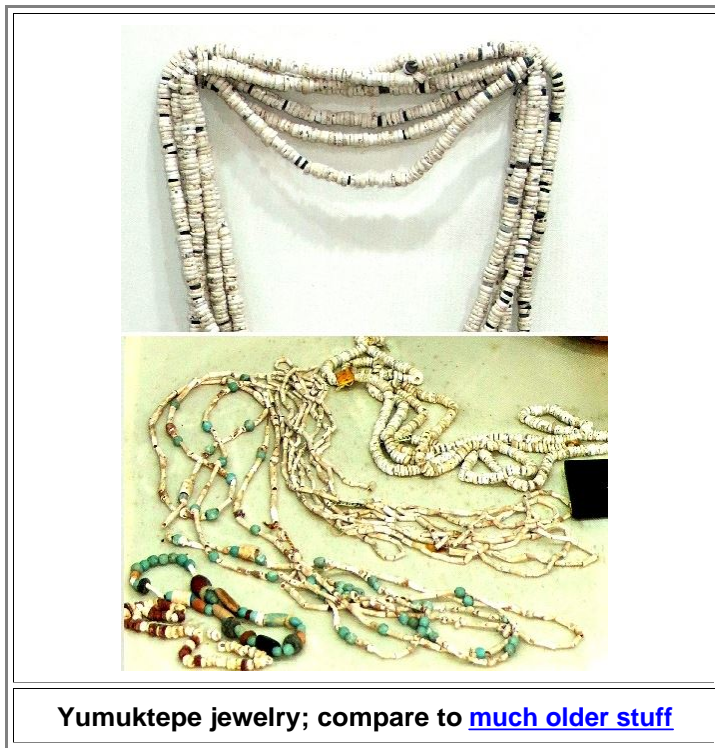
Yumuktepe "Vase"

● Pottery dominates, of course. It ages well (i.e. not at all) and the experts can tell from looking at a pot(shard) from which period it is. Unfortunately, Turkish museums typically won't tell. The explanation given for the pretty object above (and for some below) is included in its entirety.

▸ People throughout the ages could be relied upon to provide at least two things:

1. Jewelry and other means to adorn bodies.
2. Toys for kids.

Both items have many merits on their own but also tend to make life easier for the males of the species. They promote peace and quiet.



● Note that besides the ubiquitous white bone beads, ["greenstone"](#) is prominent once more.



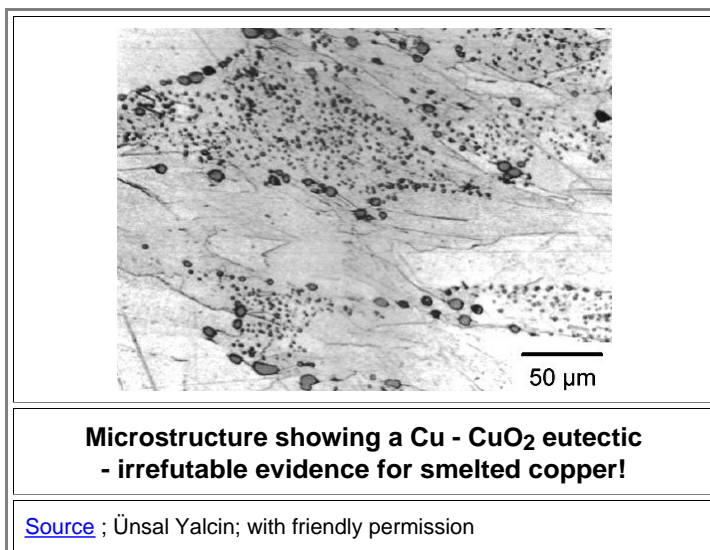
▀ I almost forgot: you typically find stone tools in stone age settlements! Here are some not-so-perfect obsidian tools found at Yumuktepe.



▀ It is time for the climax:

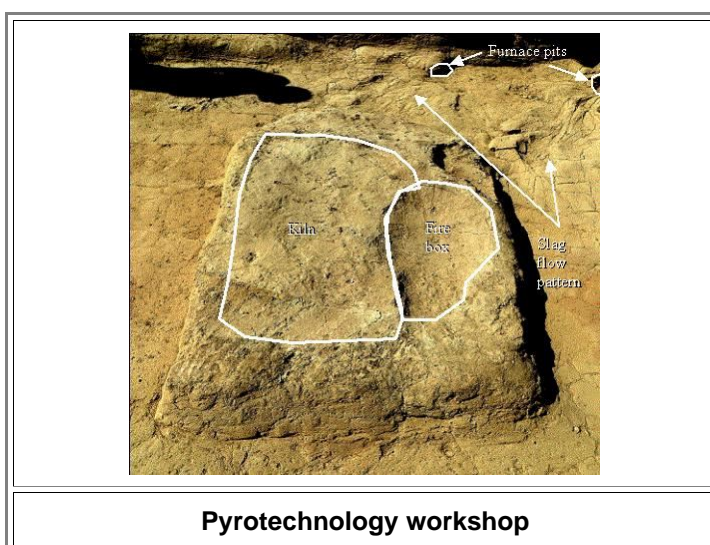
**Copper artifacts found in layers XVI
(around 5000 BC) were made from
smelted copper that was *cast***

- That was proved beyond doubt by an extended metallurgical analysis performed by [Ünsal Yalçın](#), after he was allowed to re-examine these artifacts around 2000. Ünsal Yalçın based his analysis not only on the rules for interpreting microstructures [discussed before](#) but mainly on the prominent copper oxide precipitates found in the copper plus the trace amounts of various impurities not normally encountered in native copper. Here is an example.



- The dark objects are CuO₂ precipitates. The grain structure indicates deformation and beginning recrystallization due to annealing.

Last, some tantalizing pictures I took. They must be from a layer younger than 5000 BC, from a time and when smelting was "routine". What I believe I saw - and this might be completely wrong, mind you! - is a "pyrotechnology" workshop with a kiln and two smelting furnaces:



- All that's left of the kiln is a raised platform (possibly built on mudbricks; those were around in other parts). Then we have two small (ca. 25 cm) shallow bottom pits left over from shaft furnaces, and the flow pattern of slag "imprinted" on the floor.



Flow pattern of slag from the (marked) furnace bottom

- Actually, Isabella Caneva, who I contacted later, not only granted me permission to use these pictures but affirmed my guess. What we have is actually a platform inside a Late Chalcolithic élite building of level XV, 4500 BC. Here is another picture of such a workshop that Isabella gracefully let me have:



Late Chalcolithic (4500 BC) metal workshop in Yumuktepe
[Large size](#)

Source: Provided by Isabella Caneva; Thanks!

¹⁾ Isabelle Caneva: "Mersin-Yumuktepe in the Seventh Millennium BC; an updated view", in: "The Neolithic in Turkey; Central Turkey", ed. Mehmet Özdoğan et al., Archeology and Art Publ., 2012, p. 1 - 29