

## STRIP DRAWN WIRE FROM IRON AGE NARCE

(Con la tav. XLVI f.t.)

Was wire manufactured with the use of a drawplate in antiquity? The question remains controversial. At one point drawmarks were considered proof that wire was modern rather than ancient, but recent research has shown that two techniques used in antiquity, strip drawing or strip twisting and then drawing, leave marks which are easily mistaken for the markings on solid hand drawn wire (1). However, there is still no evidence that the technique of solid hand drawing was known before approximately 1000 A.D., and the history of variant techniques remains unclear. Study of silver wire from Iron Age Italy, however, provides new data.

The wire in question came from tomb 23M at Narce (2). This tomb group is now in the University Museum, Philadelphia, and dates approximately to the first half of the seventh century B.C. (3). The wire, which once formed a coil and was perhaps used as a pendant, earring, or ornament, was examined by metallographic analysis (4). The longitudinal section at a magni-

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(1) D. L. CARROLL, *Drawn Wire and the Identification of Ancient Jewelry*, *AJA* LXXIV, 1970, p. 401; *Idem*, *Wire Drawing in Antiquity*, *AJA* LXXVI, 1972, pp. 321-323. For the technique of wire drawing: E. G. THOMSEN - H. H. THOMSEN, *Early Wire Drawing through Dies*, *ASME Transactions, Journal for Engineering for Industry*, 1973.

(2) Inventory Number MS 783B. The tomb is published by E. H. DOHAN, *Italic Tomb Groups in the University Museum*, 1942, pp. 41-46, pl. 22.

(3) The tomb belongs to Dohan's second group, roughly contemporary with the Bocchoris tomb (DOHAN, *op. cit.*, pp. 105-109). For more recent discussion: I. STRØM, *Problems Concerning the Origin and Early Development of the Etruscan Orientalizing Style*, Odense 1971, pp. 148-149.

(4) This technique involves mouting a fragment of the wire in a thermosetting plastic holder so that both a longitudinal section and a cross section are exposed. The specimen is then polished following standard metallographic procedure and its surface

fication of X 50 shows black streaks which run parallel to the long axis of the wire (*tav. XLVI, a*). These black streaks are the result of corrosion which has preferentially attacked the surface of the wire, probably because the surface was originally scratched or grooved in a longitudinal direction. The cross section shows the same phenomenon (*tav. XLVI, b*) (5).

Another fragment of wire was examined after the heavy corrosion had been removed. The wire is marked by one deep groove that runs parallel to the long axis of the wire for part of its length and then spirals gently around the surface of the wire (*tav. XLVI, c*). Several other scratches can also be seen running parallel to the long axis (*tav. XLVI, d*). Because the deep groove has such a shallow pitch, because it runs parallel to the long axis for part of the way, and because there are other shallower grooves, it seems likely that the wire was made by strip drawing (6), a process which involves taking a strip of metal and pulling it through a drawplate. The deep groove is formed by the edges of the metal strip which are squeezed together; the other grooves are the result of pulling the strip through the drawplate. The deep groove may spiral at one point because the strip of metal was twisted as it was pulled through the drawplate in order to reduce 'drag' and to make the drawing operation easier.

The appearance of strip drawn wire in Iron Age Italy is not surprising in view of the skill of Italian metalworkers of the Orientalizing period. Witness Etruscan granulated jewelry (7), or the Etruscan use of steel and iron (8). However, even taking into account this skill, several questions come to mind. The technique of strip drawing was known in antiquity, in Egypt from the Early Dynastic period onwards, and in the Mediterranean during the Roman era (9), but the appearance of this technique in Italy, in Faliscan territory during the Iron Age, needs to be explained. Compounding the problem is the question of source. Was the wire made locally or elsewhere? Does the technique used to make it reflect an Etruscan or a Faliscan metal-working tradition, or should we rather refer to a central Italian tradition? In the sixth and fifth centuries B.C. there was strong, if not overpowering

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chemically etched to reveal the grain structure of the metal. The Narce wire was etched with a five percent solution of potassium cyanide and ammonium persulfate.

(5) The specimen was also analyzed with an energy dispersive X-ray spectrometer (EDAX) associated with the scanning electron microscope in order to determine composition. Qualitative results showed mostly silver with a little iron and traces of copper.

(6) For this technique: CARROL, *op. cit.*, p. 322.

(7) S. BORDI, *Sull'oreficeria granulata etrusca*, in *St. Etr.* XXIV, 1955, pp. 353-363.

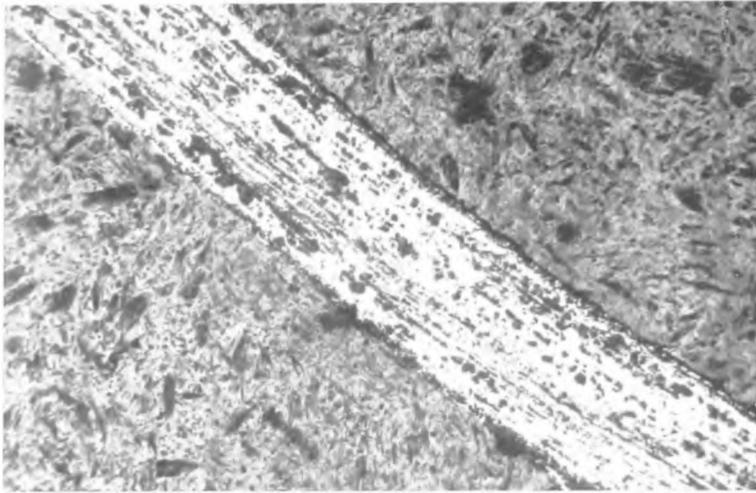
(8) G. PANSERI - M. LEONI, *La tecnologia del ferro presso gli etruschi*, in *St. Etr.* XXIX, 1961, pp. 235-243.

(9) CARROL, *op. cit.*, p. 323.

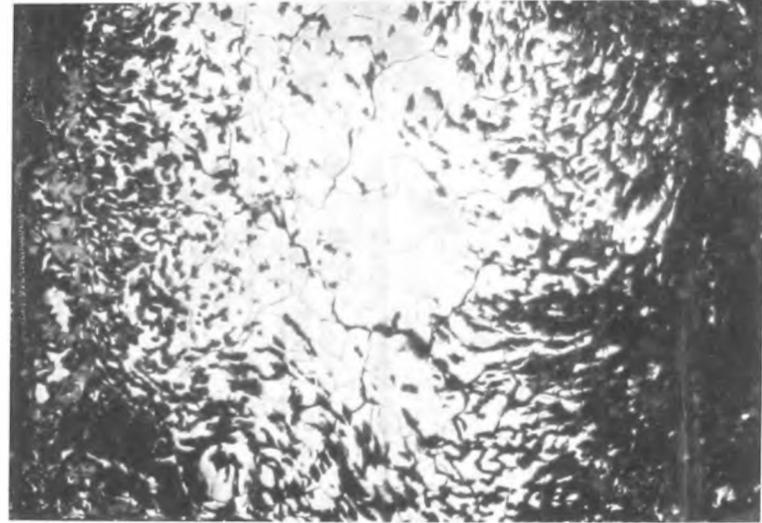
Etruscan influence on Faliscan territory, but can this influence be assumed for the Orientalizing period?

The appearance of strip drawn wire in central Italy in the Orientalizing period raises important questions, both about the technology for making jewelry in antiquity, and about Etrusco-Faliscan relations in the early Iron Age. One piece of wire is certainly not sufficient to answer these questions, but further scrutiny of ancient metal artifacts and discussion of the techniques used to make them may provide some new answers.

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*a*



*b*



*c*



*d*

- a*) Narce Tomb 23M. Longitudinal section of silver wire. Etched with 5% Potassium Cyanide and Ammonium Persulfate, X50.  
*b*) Narce Tomb 23M. Cross section of silver wire. Etched with 5% Potassium Cyanide and Ammonium Persulfate, X100.  
*c-d*) Narce Tomb 23M. Silver wire. University Museum, Philadelphia, inventory number MS 783.