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*Le fil « à astragales », ou fil perlé, de la tradition médiévale à la technique et aux outils utilisés par les orfèvres romains Castellani au XIX<sup>e</sup> siècle*

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# The wire ‘at astragals’, or beaded wire, from medieval tradition to the technique and tools used by the Roman goldsmiths Castellani in the 19<sup>th</sup> century

*Le fil « à astragales », ou fil perlé, de la tradition médiévale à la technique  
et aux outils utilisés par les orfèvres romains Castellani au XIX<sup>e</sup> siècle*

Maurizio DONATI\*

**Abstract:** This research describes the methods of construction of beaded wire (‘at astragals’), used as decoration by goldsmiths from medieval times until the 19<sup>th</sup> century, in the work of the Roman goldsmiths Castellani. This paper focuses on fifteen original steel tools from Alfredo Castellani’s Legacy, retrieved in 1978, restored and inventoried by the author. These tools are used to describe the technique used in the Castellani workshop. This technique is compared with the technique described in the Theophilus Presbyter’s treatise.

**Résumé :** Ce travail démontre les méthodes de construction du fil perlé (« à astragales ») utilisé par les orfèvres comme décoration dès la période médiévale jusqu’au XIX<sup>e</sup> siècle, période pendant laquelle ce fil est utilisé par les orfèvres Castellani, à Rome. Cet article se concentre sur 15 outils originaux en acier, provenant de la Succession d’Alfredo Castellani, récupérés en 1978 et restaurés et inventoriés par l’auteur. Grâce à ces outils, il a été possible de décrire la technique de production utilisée dans les ateliers des Castellani. Cette technique est comparée à celle décrite dans le traité de Théophile.

**Keywords:** beaded wire, astragal, Castellani, tools, Theophilus Presbyter.

**Mots-clés :** fil perlé, astragale, Castellani, outils, Théophile.

The purpose of this research on the production of wire ‘at astragals’, or beaded wire, is to establish a complete description of its construction methods, inherited from the medieval tradition and passed on by the German or Lombard monk Theophylus Presbyter (end of the 11<sup>th</sup>-early 12<sup>th</sup> century) in his treatise “Diversarum artium schedula” (Dodwell, 1961). This wire was used for goldsmiths’ decorations in

ancient times, fell into disuse after the Middle Ages, and continued in the 19<sup>th</sup> century, returning especially in vogue with the work of the Roman goldsmiths Castellani (Archivio di Stato di Roma (A.S.R.) Fam. Castellani, reg. 87), prompted by the finds from archaeological excavations.

This research has made use of a theoretical approach informed by the medieval treatise, and of a practical one con-

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\* Master goldsmith, emeritus professor at the Istituto Statale d’Arte di Roma 1, honorary member of the “Università e Nobile Collegio degli Orafi Gioiellieri Argentieri dell’Alma Città di Roma” – Via Alessandro Stradella, 90, 00124, Roma, Italy. (donati.m@email.it)

sisting of fifteen original steel tools suited for this wire (Fig. 1), part of a collection of 1327 tools, belonging to the Legacy of Alfredo Castellani to the “Museo Artistico Industriale di Roma” (M.A.I.), donated when he died in 1930, retrieved in 1978, restored and inventoried by the author. Alfredo Castellani, son of Augusto (Roma 1865-1930), left to the M.A.I. in 1930 some drawings, tools and many other objects issuing from his father's workshop. The Legacy went partly lost, partly dispersed among the Museo di Palazzo Barberini, Museo della Civiltà Romana and the Istituto Statale d'Arte di Roma (I.S.A. 1) (Donati, 2005). The found tools lie at present in I.S.A. 1, with the following marking: Castellani Legacy, group Diverse / from entry 890 to 904, nn, V/36-V/50.

Judging from the works created in the Castellani workshop, as one discovers in the registers of the inventories, beaded wire and also the tools suited for its making were already in use starting with the years 1852/1853, coinciding precisely with the proofs worked out for granulation. The wire was usually made by a workman, a certain Belli [Gaetano] (1832-1872), as can be read in A.S.R., Famiglia Castellani, Reg. 132: “Belli, oro a stampare sdragoli, novembre 1862”. Belli is cited in the Castellani registers from number 126 to number 137, and also in numbers 37, 38, 39, and 44. He was mostly responsible for melting gold, for the production of grains of gold, for moulding various motifs, for repairs of silver objects, for the preparation of welds and earths to produce the ‘colour’, or indeed for the ‘sdragola’.

In the records of Castellani's workshop (which are all kept in the A.S.R.), it is interesting to observe the following terms in the goldsmith's lexicon: the term ‘astragal’ (derived through

the Latin *astragalus* from the Greek αστράγαλος: rib, bone, dice) is misspelled as the dialect term ‘sdragola’ or ‘asdragola’, as repeatedly found in inventories and catalogues.

Concerning the production of beaded wire, for many years various studies (Hoffmann and Davidson, 1966; Lipinsky, 1975; Formigli, 1985) have indicated two likely methods of construction with tools referable to classical or medieval jewellery, or from conjecturing or referring to descriptions present in some treatises. Specifically regarding the system adopted by the Castellani, mere hypotheses have been put forward to date, failing objective comparisons (Ogden, 2004).

Therefore, the recovery of their original tools was important for pinpointing their methods, as they allowed the discovery of the technique used in their workshop to produce beaded wire.

For the construction of these tools, the Castellani have certainly followed the description from Theophilus Presbyter's treatise (in Caput IX of Liber tertius, “De instrumento quod organarium dicitur”), considering that the entire technical concept corresponds to the medieval annotations made by Theophilus, with the exception of the percussion: the Castellani used a rocker arm, whereas in Theophilus it was made “cum malleo corneo”.

The typology of the Castellani tools under discussion here varies according to their use: some of them are suitable to produce apical parts of beaded wires (for hanging details of necklaces, Castellani's Legacy, tool entry 895, V/41), others to produce continuous beaded wires (Donati, 2007), a feature that was more frequently used by the Castellani (see Fig. 2). The matrices are also different in dimensions and in number, size, form, and diameter of the stamped sections.

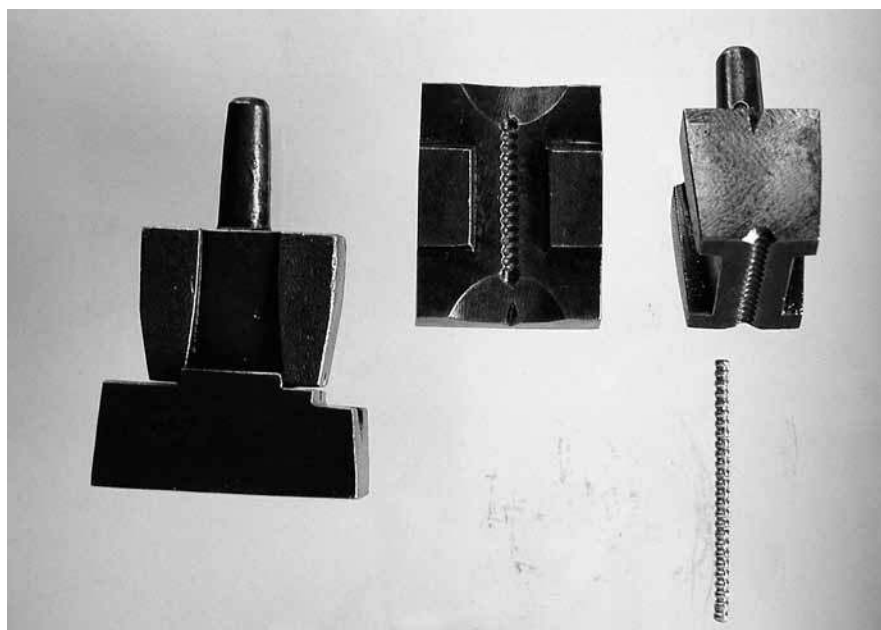


Figure 1: (See colour plate) Four original steel tools from the Alfredo Castellani Legacy to M.A.I. of Rome, entries 897-898, V/43, V/44; entries 899-900, V/45, V/46 (I.S.A. 1) (Photography by M. Donati).

Figure 1 : (Voir planche couleur) Quatre outils en acier originaux appartenant à la Succession d'Alfredo Castellani, M.A.I. de Rome, entrées 897-898, V/43, V/44; entrées 899-900, V/45, V/46. (I.S.A. 1) (photographie par M. Donati).

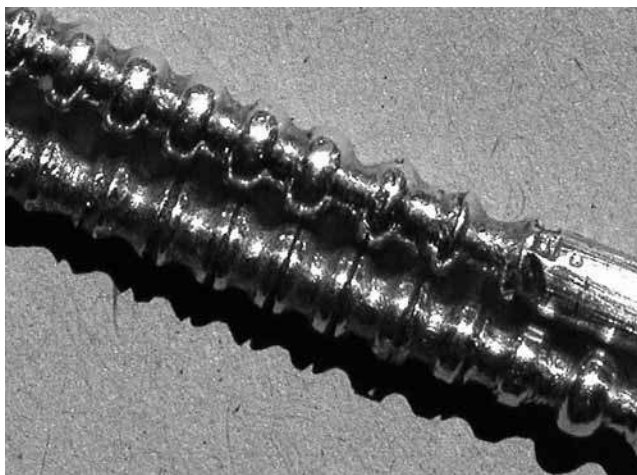


Figure 2: Detail of beaded wire, with typical faults: middle groove and irregularity of beads (Photography by M. Donati).

*Figure 2 : Détail d'un fil perlé avec les anomalies typiques : sillon au milieu et l'irrégularité des perles (photographie par M. Donati).*

Normally they are used two by two (Castellani's Legacy, tool entries 894, 896, 897, 898, 899, 900, 901, 902, 903, 904): one above and the other below, each with appropriate anchor seats drawn from the same tools, and through a rocker arm (Fig. 3).

One half of the sections are printed in the upper stool, the other in the bottom one. The upper one has a support shank; the bottom one, parallelepiped, shows two 'projec-

tions', which are correlated with the two suitable anchor seats of the upper tool, so that they can be firmly joined together.

For the procedure, the golden or silver wire was laid down between the two parts, usable in superimposed position, just in the grooves of their respective seats; afterwards, the wire was twisted on its axis and was simultaneously hammered with a rocker arm; its position was maintained with the aid of a buckle of wood or metal, in order to prevent the movement of the wire from their location. Once it reached the complete form of beads, it was continued for a segment, usually in proportion to the length of the tool, leaving out only one bead in the last seat for measuring, in order to secure a regular work without imperfections.

The section of the wire, before beading, could have been diverse: round, square, hexagonal, octagonal. However, the initial diameter, or the distance between the faces, should have been slightly smaller than that of the completed bead, proportionately of the order of a few tenths of millimetres (in the Castellani's pair of tools V/43 and V/44, the wire's section had the following initial and final diameters: 2.43 and 2.72 mm, respectively. The upper tool (entry 897) includes 15 cells, the bottom tool (entry 898) 13. A basic measurement gave the following dimensions: 30.7 x 21.7 mm for the upper tool; 38.4 x 30 mm for the bottom tool. For tools V/46 (entry 900) and V/47 (entry 899), the initial and final wire's diameters are 3.05 and 3.29 mm, respectively; for the upper tool: 10 cells, 31.5 x 21.7 mm; for the bottom tool: 9 cells, 41 x 30.5 mm), in order to prevent that the continuity of the beads was interrupted with an abnormal overlap related to the increase due to superficial waves of metal. This defect occurred always in cases of initial excess of metal and was usually irreparable.

However, an approach to work with a scanty amount of metal could have been inadequate for an optimum result, because, due to the shortage, it could have created a furrow in the middle, a feature that nevertheless should have been remedied by actions repeated until the disappearance of the same furrow. Moreover, there could be other causes, not considered yet, of further defects, for example the fortuitous small displacement of the two tools.

A considerable number of works with this type of decoration is currently on display on the shelves of the Modern Augusto Castellani Collection in the National Etruscan Museum of Villa Giulia in Rome: almost 106 jewels (Fig. 4), one sixth of the entire collection, divided in seven or eight parts, associated with various historical periods, referred to as: "Primigeno" (Primitive), "Tirreno" (Tyrrhenian), "Etrusco" (Etruscan), "Siculo" (Sicilian), "Romano" (Roman), "Medievale" (Medieval), "Rinascimento"

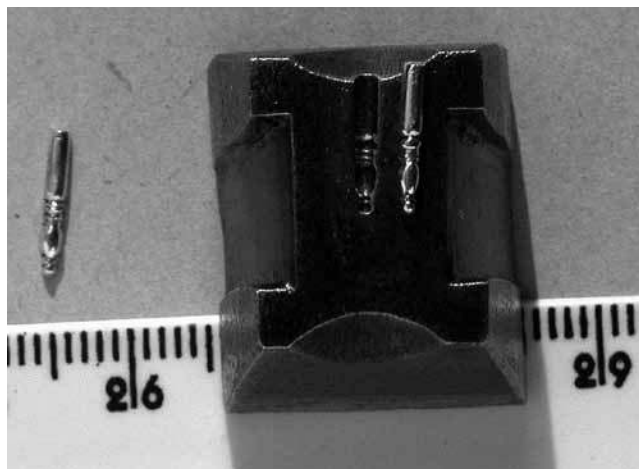


Figure 3: Original Castellani steel tool (une seule partie présentée) with proof on silver, apical part of beaded wire. Entry 895, V/41 (Photography by M. Donati).

*Figure 3 : Outil en acier original de Castellani (sans l'autre) avec épreuve en argent, partie trillée du fil perlé. Entrée 895, V/41 (photographie par M. Donati).*



Figure 4: (See colour plate) Brooch with cameo of George Washington. Made by Castellani; cameo by G. Girometti. Gold, sardonyx; frame with wire 'at astragals'. Museo Nazionale Etrusco di Villa Giulia, Roma, 85211, from Soros and Walker, 2004: Fig. 4-21 (Photography by S.A.E.M.).

*Figure 4 : (Voir planche couleur) Broche avec camée de Georges Washington. Fabriqué par Castellani; camée par G. Girometti. Or, sardonyx, monture avec fil aux astragales. Museo Nazionale Etrusco di Villa Giulia, Rome, 85211, d'après Soros et Walker, 2004 : Fig. 4-21 (photographie par S.A.E.M.).*

(Renaissance), “Moderno” (Modern). We note that in the shelf “Primigeno” there are no beaded works.

Another typical example of working with beaded wire can be observed on a work prepared by Augusto Castellani to decorate a silver plate with niello, representing a crib and adopted in the form of ‘Peace’ for liturgical functions, a work that later – June 4, 1865 – was donated by him to the University of Goldsmiths of Saint Eligio in Rome, in memory of his father. This work is almost unique among those of Fortunato Pio (Figs. 5a and 5b).

With these notes, we hope to inspire further studies, with the purpose of advancing more and more the understanding of the goldsmith’s art, a field both interesting from a technical-scientific point of view and fascinating from an aesthetic-anthropological one.



Figure 5: (See colour plate) Fortunato Pio Castellani: “Peace”, silver and niello. Gold(?) -mounted wire to astragals, by Augusto Castellani (1865). Archivio Storico, Università e Nobile Collegio degli Orefici Gioiellieri Argentieri dell’Alma Città di Roma (Photography by Di Giacomo): (a) obverse and (b) reverse.

*Figure 5 : (Voir planche couleur) Fortunato Pio Castellani: “Pace”, argent et niello. Montage en or (?) avec fils aux astragales par Augusto Castellani (1865). Archivio Storico, Università e Nobile Collegio degli Orefici Gioiellieri Argentieri dell’Alma Città di Roma (photographie par Di Giacomo): (a) avers et (b) revers.*

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