

Stanislas Bonfils (1823-1909) at the dawn of experimental archaeology

Unpublished experimental objects from the Museum of human palaeontology of Terra Amata, Nice (FR)

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Introduction

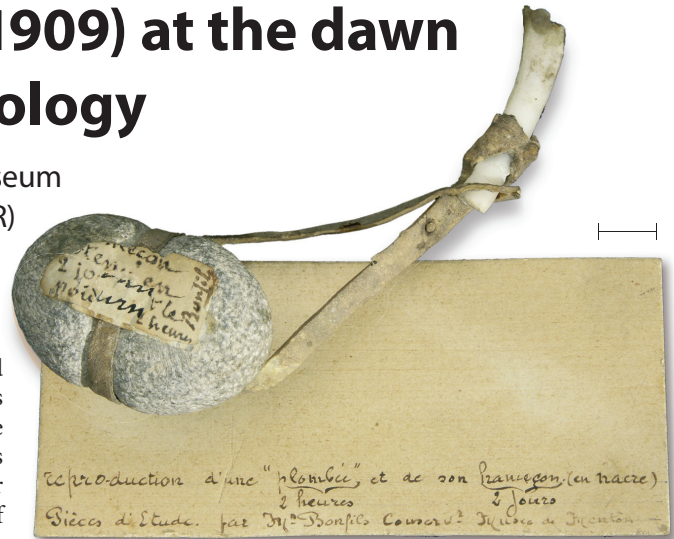
Stanislas Bonfils (1823-1909) was one of the first archaeologists to have taken an interest, as early as 1850, in the Grimaldi or Balzi Rossi Caves at Ventimiglia, Italy. In particular, he excavated the Barma Grande, Florestan and Cavillon Caves and also la Grotte des Enfants where he made numerous discoveries. In 1872, he published his only written work: *Recherches sur les outils en silex des troglodytes et sur la manière dont ils les fabriquaient* (Bonfils and Smyers, 1872) (An inquiry into cave dwellers' flint tools and their production), in which he showed a special interest in the raw materials and techniques used to manufacture the tools. Previously, he had begun the experimental production of several series of objects with a view to comprehending, *la manière dont les races préhistoriques fabriquaient les outils et les armes que la science leur a attribués* (how prehistoric man manufactured his tools and the weapons science that made them) (Bonfils and Smyers 1872, p. 6). These objects which were written about by Commandant Octobon (1938, p. 89)¹ and more recently were the subject of a publication by Pierre-Elie Moullé and Almudena Arellano (Moullé and Arellano, 2008) are in the safekeeping of the Regional Museum of Prehistory at Menton. Bonfils featured several of these pieces in the photographic plates

of his 1872 publication. By all accounts, the collection of experimental objects to be found at Menton match descriptions of experiments known to have been carried out by Bonfils prior to 1872. To add a further dimension to the research of Moullé and Arellano (2008), we would like to present the study of a hitherto unpublished series of experimental objects by Bonfils which are part of the collections of the Museum of human Palaeontology of Terra Amata (Nice, France).

History of the Collection

This series of pieces was part of the *La Collection Bonfils* which was donated on 31st May 1914 to the Nice Museum of Natural History (Musée Barla) by the *Dames Aglaé and Amandine Bonfils*. It was registered under number 232 with the following mention, *une très intéressante collection de fossils, dossements et de silex préhistoriques* (A very interesting collection of fossils, bones and prehistoric flints). The Musée Barla's inventory mentions, *cette intéressante collection fait l'objet d'une vitrine spéciale* (This interesting collection is the subject of a special display). Commandant Octobon adds that Bonfils kept this collection of objects at home and that it was given to the Musée Barla of Nice by his heirs [...] (Octobon, 1952).

In 1977, the entire collection of prehistoric lithic industries was transferred from the Musée Barla to the newly opened Museum of human palaeontology



■ **Fig. 1** Experimental fishing weight and hooks manufactured by Bonfils, Museum of human palaeontology of Terra Amata (Nice), inv.: TA.MB.BONEX.06.01 (all photos: Muriel Anssens)

of Terra Amata assembling all the prehistoric objects belonging to the Town of Nice under the same roof. In 2006, a review of the Terra Amata inventory was commenced, at which time *La Collection Bonfils* (which was recorded under the numbers TA.MB.BONEX.06 from 1 to 22) caught the attention of the authors.

Description of the Collection

This unpublished collection that Bonfils called, *pièces d'étude* is composed of 22 objects: 3 sets of objects, 14 reproductions of bone and tooth beads and 5 reproductions of lithic industries.

■ **TA.MB.BONEX.06.01:** fishing weight and hook (Fig. 1)

This small, thick, oval-shaped limestone pebble (45-31-28 mm) has a groove extending around the circumference (6 mm wide) and shows traces of pecking. A leather strap to the end of which is attached a long, rectangular piece of mother-of-pearl (hook, 40-9-4 mm), is tied round the groove. The set bears a label with the inscription, *hameçon obtenu en 2 jours [...]*

po[...] 2 heures (hook obtained in 2 days[...] 2 hours) and *Bonfils*. This covers on old label. The object is attached to a small piece of card with the mention, *reproduction d'une plombée (2 heures) et de son hameçon en nacre (2 jours). Pièces d'étude par M. Bonfils, Conservateur du Musée de Menton* (reproduction of a fishing weight (2 hours) and mother-of-pearl hook (2 days). Study pieces by M. Bonfils, Curator, Menton Museum.)

■ **TA.MB.BONEX.06.03:** fishing net weight and bead (Fig. 2)

This small oval-shaped limestone pebble (53-38-38 mm) has a groove (13 mm wide)



■ **Fig. 2** Fishing net weight and stone bead manufactured by Bonfils, Museum of human palaeontology of Terra Amata (Nice), inv.: TA.MB.BONEX.06.03

¹ Octobon François-Charles-Ernest, Commandant (1881-1969): an eminent prehistorian who, after a distinguished military career, was active in the Alpes-Maritimes and Liguria regions in promoting research into prehistory, archaeological excavations (in particular at the Grotte du Lazaret, Nice, in which he participated personally during a 15 year period) and the protection of archaeological sites (La Vallée des Merveilles, Mont Bégo, Alpes-Maritimes).

extending around the circumference. Its edges bear numerous traces of pecking. A label mentions "Poids de filet obtenu en 3 heures [Fe rnde ?]" (Fishing net weight obtained in 3 hours [...]) and "Bonfils". Fragment of schist (67-33-8 mm), most of the perimeter is polished. It has two holes, the first which is biconical bears a label "avec silex, 1 jour" (With a flint, 1 day), the second is cylindrical and is labelled "avec vrille, 20 minutes" (with a drill, 20 minutes). The back of the label is marked "S. Bonfils". These two pieces are attached to a piece of card bearing the additional information "Ces pièces ont été reproduites par M. S. Bonfils, conservateur au Musée de Menton vers 1900" (These pieces were reproduced by M. S. Bonfils, Curator of the Menton Museum, circa 1900).

■ **TA.MB.BONEX.06.04:** eyed needle and perforator (Fig. 3)

This eyed needle (72-8-3 mm), which was probably manufactured from a rib, is pierced and polished. The object is attached to a small flint blade (33-10-3 mm). Its characteristic patina indicates its prehistoric origin. Bonfils transformed this item into a perforator. This is revealed by recent retouching on the near side. A label, also attached to the two items reads "Eguille (sic) en os fabriquée en une journée. Ce silex a servi à faire le trou. Bonfils" (Bone needle produced in one day. This flint was used to make the hole. Bonfils). The card to which the needle is stuck bears the mention "Bonfils, Menton 1905".

■ **TA.MB.BONEX.06.05:** polished axe (Fig. 4) One of the ends of this serpentine pebble (68-28-13 mm) has been ground to produce a cutting edge which is slightly irregular. A label indicates "Hachette en serpentine obtenue en 4 jours. Bonfils" (Small serpentine axe obtained in 4 days. Bonfils). The text is reproduced on an attached card.

■ **TA.MB.BONEX.06.06:** pecked pebble

Limestone pebble (137-45-30 mm) displaying numerous stigmata produced by pecking on most of its perimeter. Two concave areas have been gouged out by pecking, one on each side of the distal part of the pebble as if the archaeologist had attempted to bore a hole through the pebble. A label which is glued to the object is illegible except for the words "cupules" (cupulae) and "Bonfils".

■ **TA.MB.BONEX.06.02:** point (Fig. 5) Radiolarite flake (red jasper) (37-7-12 mm) worked to a point. Small removals can be observed on the point which seems to indicate that the tool has been used. The distinctive patina on this item indicates that it could very possibly have originated from one of the Balzi Rossi Upper Palaeolithic series of lithic industries.



■ **Fig. 4** Axe in green rock manufactured by Bonfils, Museum of human palaeontology of Terra Amata (Nice), inv.: TA.MB.BONEX.06.04

■ **TA.MB.BONEX.06.13 and 18:** fragment of bone with a hole (Fig. 5) This fragment of bone (65-38-15 mm) was possibly taken from an ox vertebra. It has been polished and displays two holes. One is tronconical and is labelled "os percé au silex" (bone pierced with a flint), the other is perfectly cylindrical and is marked "os percé avec vrille" (bone pierced with a drill). This piece is broken in two.

■ **TA.MB.BONEX.06.07:** pecked percussion implement This long, thick sandstone pebble bears many traces of

percussion on its distal end which is pointed. It is possible that this pebble was used for pecking. The edges have been partially polished. A label is glued to this item; however the text is completely obliterated.

■ **TA.MB.BONEX.06.08:** pecked and ground pebble, preform of polished axe This small pebble (53-40-31 mm) of fairly poor quality flint mixed with calcedonious rock probably came from the Eocene Microcodium conglomerates in the Ciotti region of Liguria. One face has been polished, the distal part of which has been ground to form a cutting edge. Most of the edges have been pecked indicating that it is a preform of a polished axe. A barely legible label reads "hache en silex [...] en 15 jours. Bonfils" (flint axe [...] in 15 days. Bonfils).

rations are noted. The first is biconical, the second cylindrical. A label is stuck to it which reads "Pendeloque trou avec vrille 10 minutes et au silex 1 jour. Bonfils" (Pendant, hole with drill 10 minutes, with flint 1 day. Bonfils).

■ **TA.MB.BONEX.06.11:** fragment of bone with a hole This fragment of bone (45-32-18 mm) from an ox rib cartilage features a cylindrical hole.

■ **TA.MB.BONEX.06.12:** small round fragment of bone with a hole (Fig. 6) This fragment of bone (62-26-15 mm) most probably from an ox vertebra has been worked to make a small round disc. The borders and one of its faces has been partly smoothed down by grinding. In the centre is a large hole. The label is very faded and reads "rondelé en os" (sic) (small bone disc).

■ **TA.MB.BONEX.06.14:** fragment of bone with a hole This fragment of spongiosa (43-29-16 mm) has a perfectly cylindrical hole. A torn label reads "[...]s percé [...] vrille" ([...]s bored [...] drill).

■ **TA.MB.BONEX.06.15:** fragment of bone with a hole This small fragment of spongiosa (24-14-7 mm) has a cylindrical hole. The edges have possibly been ground to form the shape of a deer canine.

■ **TA.MB.BONEX.06.16:** fragment of bone with a hole, pendant (Fig. 6) Very similar to TA.MB.BONEX.06.10, this fragment of bone (44-23-9 mm) almost certainly came from the apophysis of a deer vertebra, the edges of which have been partly ground. It has two holes, one biconical, the other perfectly cylindrical. A label is attached to this item "[...]oque [...] avec une vrille [...] minutes et avec [...] silex 1 jour. Bonfils" ([...] with a drill [...] minutes and with [...] flint 1 day. Bonfils).

■ **TA.MB.BONEX.06.17:** fragment of bone with a hole
This small fragment of spongiosa (25-17-8 mm) is very similar to TA.MB.BONEX.06.15 and has a cylindrical hole. The edges have perhaps been ground to obtain the shape of a deer canine.

■ **TA.MB.BONEX.06.19:** small round fragment
This piece of spongiosa, probably from an ox vertebra, has been worked to obtain a disc shape (54-53-9 mm). This piece has been broken in four.

■ **TA.MB.BONEX.06.20:** fragment of worked bone
The edges of this fragment of bone probably from a vertebra (28-18-8 mm) have been ground to obtain the shape of a deer canine as for TA.MB.BONEX.06.15 and 06.17.

■ **TA.MB.BONEX.06.21:** fragment of worked bone
Joint cavity of the left scapula of a deer (56-41-17 mm); some areas of which have been worked by grinding.

■ **TA.MB.BONEX.06.22:** fragment of bone with a hole
This fragment of spongiosa (46-24-9 mm) has been ground at both ends and has a hole in the middle. This piece has been broken in two.

Stanislas Bonfils at the dawn of experimental archaeology

As Moullé and Arellano (2008, p. 128) point out, Stanislas Bonfils carried out numerous experiments in an effort to understand how Prehistoric Man manufactured his tools. Bonfils developed this approach in the 1870's making him one of the pioneers of modern experimental archaeology along with Sven Nilsson, John Evans, Augustus Henry Lane Fox Pitt-Rivers, James Wyatt, Sydney B. J. Skertchly and Hippolyte Müller (Johnson 1978, p. 337-339; Mussi et al. 2008, p. 185; Morin, 2004). Indeed, his

1872 publication states “*Nous nous sommes livrés à une série d'expériences, afin de rechercher les moyens employés pour produire les différents outils qui sont en notre possession. Nous avons pris pour point de départ de nos études l'absence absolue de tous outils (modernes) et nous sommes arrivés, après de nombreux essais, à (en) produire nous-mêmes.*” [...]. (We proceeded with a series of experiments to investigate the methods used to produce the various tools in our possession. The starting point for our investigation was the complete absence of all modern tools and after many attempts, we managed to produce some of them ourselves) [...]. (Bonfils and Smyers 1872, p. 6).

Despite some errors of interpretation, for example, that the technique of retouching was reserved exclusively for end-scrapers (Rivière 1887, p. 95-96; Moullé and Arellano 2008, p. 128), his approach is intrinsically contemporary. He compares the archaeological material with the experimental item, presenting the two side by side in the same plate and on a scale of 1: “*Les figures, de 26 à 36, sont des outils en silex trouvés dans les grottes de Baoussé-Roussé. Ils ne diffèrent des figures 2 à 25, qui sont des outils produits par nous, que par les nombreux petits arrachements de leurs arêtes, arrachements qui ont, par erreur, ainsi que nous le démontrerons, été attribués à de petits coups donnés pour les façonner.*” (Figures 26-36 are flint tools found in the Balzi Rossi Caves. They only differ from the tools that are of our manufacture (figures 2-25) in the many small removals from the edges which were thought, wrongly, as we shall demonstrate, to be the result of small blows given to obtain a particular shape.) (Bonfils and Smyers 1872, p. 8).

Similarly, Bonfils looked at the amount of time taken to produce the object. This was carefully noted on each label. For example, the fishing

weight TA.MB.BONEX.06.03 (Fig. 2) was obtained by pecking in three hours. He also often compared the prehistoric and modern working tools for their efficiency. For example the pendant TA.MB.BONEX.06.10 (Fig. 6, lower right) is perforated twice with two different tools. He notes that where it requires 10 minutes to make a hole in bone with a metal drill; it requires a whole day with a flint perforator. The tools used by Bonfils, for example “*le silex en pointe qui a servi à faire le trou*” (the pointed flint that was utilised to make the eye of the needle TA.MB.BONEX.06.04 (Fig. 3), were carefully preserved.

He takes great care to use the same raw materials as Prehistoric Man specifying in his 1872 publication “*Nous avons fait de nombreuses excursions pour découvrir le lieu où étaient ces matériaux et nous avons été assez heureux pour trouver, sur la terre ferme, des endroits où il est possible, probable même, que se fournissaient nos devanciers.*” (We made a number of excursions to locate the source of the materials used and were fortunate enough to discover inland several spots where it is possible, even probable, that our forebears found their supplies.) Thus item TA.MB.BONEX.06.08 appears to have been made from a flint originating from from the Ciotti conglomerates. He writes (his publication of 1872) “[*qu'il*] existe un endroit appelé les campagnes dei Gerbai [...] nous avons trouvé des galets et des rognons anguleux informes en silex extrêmement dur. Nous avons retrouvé de ces mêmes galets en silex sur la Colla des Ciotti, située à quelque distance au-dessus des dites campagnes [...] et aussi dans la carrière de roche calcaire qui se trouve juste au-dessous de la tour pittoresque de Grimaldi.” (Bonfils and Smyers, 1872, p. 12) (There is a place called “la campagna dei Gerbai [...] we found pebbles, misshapen angular nodules of extremely



■ **Fig. 3** Eyed needle manufactured by Bonfils with the perforator used to make the eye, Museum of human palaeontology of Terra Amata (Nice), inv.: TA.MB.BONEX.06.04



■ **Fig. 6** Bone beads manufactured by Bonfils from animal bones and a boar's tooth, Museum of human palaeontology of Terra Amata (Nice), inv.: TA.MB.BONEX.06.12, 06.10, 06.09 et 06.16 (from top to bottom)



■ **Fig. 5** Bone bead manufactured by Bonfils and radiolarite point probably of archeological origin, Museum of human palaeontology of Terra Amata (Nice), TA.MB.BONEX.06.13 et 06.02

hard flint. We found the same flint pebbles on the Colla dei Ciotti, situated a short distance from Gerbai [...] and also in the limestone quarry just below the picturesque Grimaldi Tower). Sometimes he uses the archaeological objects themselves, for example the radiolarite point TA.MB.BONEX.06.04 or the perforator (made from a backed bladelet) which was used to pierce the eye of the needle (TA.MB.BONEX.06.04, Fig. 3).

In the series mentioned in the 1872 publication (*Bonfils and Smyers, 1872*), now in the keeping of the Museum at Menton, Bonfils' principal concerns are the techniques associated with stone shaping, the uses of these lithic industries and the traces of wear linked to tool usage, to the manufacture of bone tools and hafting.

On the other hand, the Terra Amata series, while demonstrating Bonfils' continued interest in the manufacture of bone tools (eyed needle), indicates a widening of themes to include different techniques: pecking for producing grooved weights, polishing and grinding used for axes and also the production of stone handaxes and bone beads. With this series Bonfils seems more focussed on Neolithic techniques than he was when producing the series now at Menton. In their 1872 publication, Bonfils and Smyers indicate "Nous n'avons trouvé dans les grottes précitées (Balzi Rossi) aucun outil en pierre portant des traces d'usure par frottement, [...]. Nous croyons que les outils en pierre biseautés par frottement, et qui appartiennent à un âge postérieur où l'industrie humaine avait déjà fait quelques progrès, n'existent pas dans les grottes de Bousé-Roussé." (We have not found at the aforementioned caves (Balzi Rossi) any tools bearing traces of wear by abrasion [...]. We believe that the stone tools that were ground to produce a chamfered edge, belong to a later age during which human industry had

certainly progressed and are not to be found at the Baoussé-Roussé Caves) (*Bonfils and Smyers, 1872*, p. 13). They give the example of an axe found at Cabris the Esterel (sic). It would seem that at the time, Neolithic techniques were of little interest to Bonfils which lead us to suppose that the Terra Amata pieces are post 1872. The card to which TA.MB.BONEX.06.03 is attached (Fig. 2), dated "vers 1900" (around 1900) and that of item TA.MB.BONEX.06.04 (Fig. 3) dated "1905" would appear to confirm this theory. In which case, these objects would have been manufactured by Bonfils towards the end of his life. This would also be why this series was donated to Musée Barla by his heirs together with the other objects that he kept at his home.

Conclusion

The Terra Amata collection of experimental objects, which were most probably produced towards the end of Stanislas Bonfils' career, shows concerns that are intrinsically modern. In particular: he noted the time required to manufacture an object, took care to keep and document the tools he utilised and ensured that the materials he used were identical to those used for the original item, etc. As in his archaeological excavations, where he demonstrated unusual precision, our prehistorian from Menton has an approach to experimental archaeology that was ahead of his time.

Thanks

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Summary

Stanislas Bonfils (1823-1909) est un des premiers chercheurs à fréquenter les grottes de Grimaldi ou Balzi Rossi (Vintimille, Italie), dès les années 1850. Il fouille particulièrement la grotte Barma Grande, la grotte Florestan, la grotte du Cavillon et la grotte des Enfants où il fait de nombreuses découvertes. En 1872, il réalise son unique publication : *Recherches sur*

les troglodytes et sur la manière dont ils les fabriquent. Dans ce travail, il s'interroge déjà sur l'origine des matières premières utilisées par les hommes pour tailler leurs outils et sur la façon dont ils les fabriquent. Il conçoit ainsi plusieurs séries d'objets expérimentaux, dès les années 1870, « afin de rechercher les moyens employés pour produire les différents outils qui sont en notre possession. ». Certains de ces objets sont conservés au musée de Préhistoire de Menton et ont été publiés par Pierre-Elie Mouille et Almudena Arellano. Nous nous proposons ici de présenter et de documenter une série inédite d'objets expérimentaux réalisés par Bonfils et conservés au musée de Paléontologie humaine de Terra Amata.

Stanislas Bonfils (1823-1909) war einer der ersten Forscher, welche die Höhlen von Grimaldi und Balzi Rossi (Vintimille, Italien) in den 1850er Jahren aufsuchten. Er untersuchte dabei konkret die Höhle Barma Grande, die Florestan-Höhle, die Höhle von Cavillon sowie die „Höhle der Kinder“. 1872 veröffentlichte er seine einzige Publikation: „Recherches sur les troglodytes et sur la manière dont ils les fabriquent“ (Untersuchungen über die Steingeräte der Höhlenbewohner sowie ihre Herstellung). In dieser Arbeit stellte er Überlegungen an über die Herkunft der von den Menschen verwendeten Rohmaterialien und über ihre Bearbeitungsmethoden. In den 1870er Jahren fertigte er deshalb diverse Sammlungen experimentell hergestellter Objekte an, „um herauszufinden, wie der vorgeschichtliche Mensch seine Werkzeuge und Waffen bearbeitete, welche die Wissenschaft dazu machte“. Einige dieser Objekte sind im Museum für Urgeschichte in Menton erhalten und wurden von Pierre-Elie Mouille und Almudena Arellano publiziert. In diesem Artikel wird ein weiterer Satz von experimentellen Objekten vorgestellt, der von Bonfils entworfen wurde und der im Museum für die Paläontologie des Menschen in Terra Amata erhalten geblieben ist.

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