

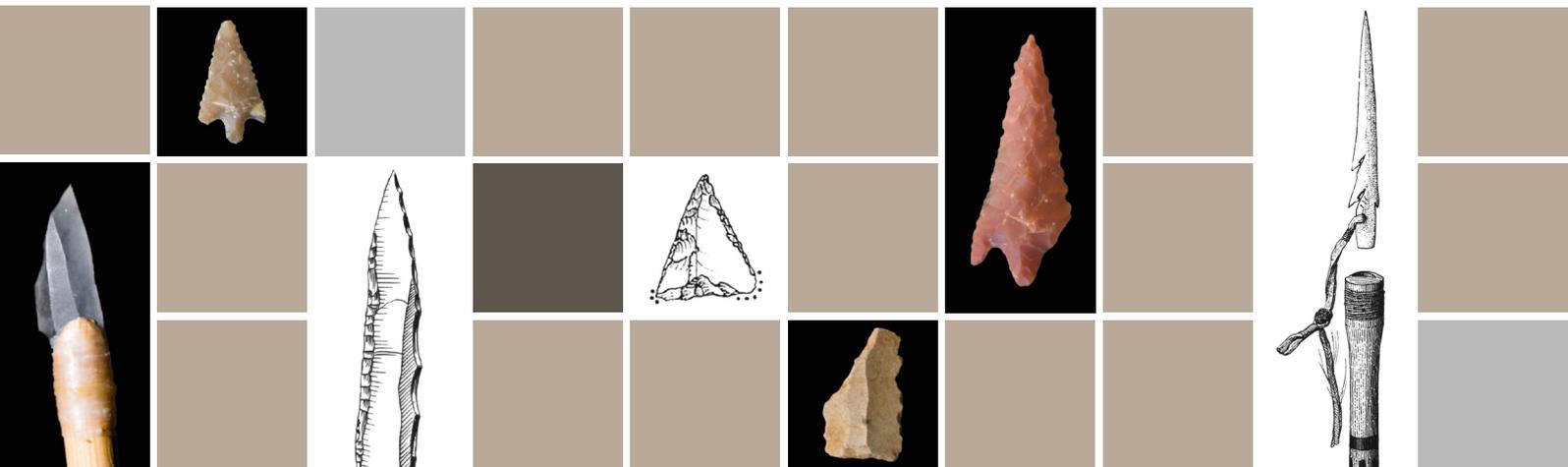
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**PROJECTILE WEAPON ELEMENTS**

**FROM THE UPPER PALAEOLITHIC TO THE NEOLITHIC**

**Proceedings of session C83**



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# BUSHMEN ARROWS AND THEIR RECENT HISTORY

## CROSSED OUTLOOKS OF HISTORICAL, ETHNOLOGICAL AND ARCHAEOLOGICAL SOURCES

Bruno BOSC-ZANARDO, François BON & François-Xavier FAUVELLE-AYMAR

### Abstract

Bushmen weapons were considered very early by ethnology: the vision of these nomadic hunter-gatherers walking away into the horizon of the Kalahari Desert, with their bows and arrows on their back, is one of the most iconic representations of this disappearing lifestyle.

Besides the technical values that were brought into play in the making of this equipment, their role as vector of social values has also been greatly illustrated. It has been shown, in particular, the way in which an arrow creates a link between the hunter and his prey, but also the interactions the arrow conveys between the user of the weapon and the social networks to which he belongs.

Nevertheless, most reference systems are based on the equipment of sub-contemporary and current populations, i.e. on those used by groups occupying a limited territory in the Kalahari Desert, straddling Botswana and Namibia. Yet, only a few decades ago, Bushmen occupied much vaster areas, corresponding to a large western half of Southern Africa, involving the exploitation of territories ecologically more contrasted than today. In addition, the socio-economic status of the ancestors of today's Bushmen was, it seems, more diversified: groups of nomadic hunter-gatherers lived side by side with pastoralists (who also practiced hunting), and it is likely that both sides belonged, to a greater or lesser degree, to societies with close links between them.

Research works realised on several collections of bows and arrows kept in South African museums and compared with historical sources (travel accounts from the 16th to the 19th centuries in particular), also bring to light greater diversity: the diversity of the actual armoury (the spear, the club and the throwing stick in addition to the bows and arrows); diversity in the way the arrows are actually made; and the diversity of their supposed functions (from hunting to war). Behind such diversity, we can try to grasp the complexity of the recent history of the Bushmen populations.

**Key-words :** Bushmen, Khoisan, bow and arrow, archaeohistory, ethnoarchaeology, Southern Africa

## Introduction

When we chose, within the framework of the “Khoisan Archives” programme directed by one of us (F.-X. F.-A.), to take an interest in Southern African populations of hunter-gatherers (Bushmen) and nomadic pastoralists (Khoikhoi), our ambition was to develop a “classic” ethno-archaeological approach, i.e. to analyse the sub-contemporary and contemporary data we could obtain on these populations via ethnology and history, so that, in return, we could interpret the archaeological data.

We then decided to focus our attention on a register of activities and a category of objects: hunting and related instruments, mainly bows and arrows to be specific. Besides the fact that it is with this register of Bushmen equipment that we were counting on developing methodological comparisons on a wider scale (towards European Prehistory in particular), it turns out that these objects are among the most favourable, within the material culture of these populations, to establish a link between the different sources at our disposal, i.e. archaeological, historical and ethnological.

However, contrary to our initial expectations, we quickly realised that this approach, far from opening the doors of a prehistoric past miraculously preserved in the confines of Southern Africa, had more reasons to lead us along the complex historical course which these populations experienced during the last centuries (Fauvelle-Aymar *et al.*, 2007). From this follows the archaeo-historical outline presented in this article, which consists in offering a problematic and theoretical framework for future studies. From a methodological point of view, this study relies mainly on the elaboration of an arrow typology, from which we are trying to extract a discussion on the value likely to be given to arrowhead morphology and its evolution during the recent centuries. From this point of view also, this can only be a preliminary study, hoping it will be followed by a more exhaustive analysis

of equipments (better recognition of other arrow parameters, the use or not of poison in particular, the study of bows, etc.), relying on a more detailed techno-functional approach.

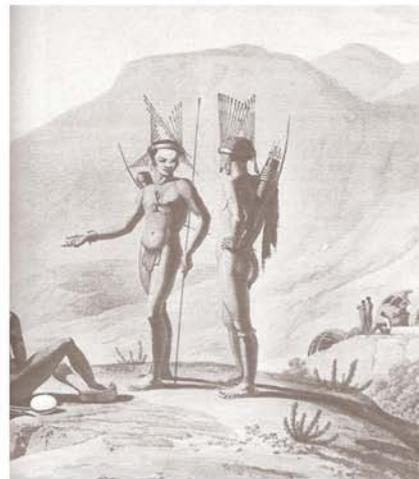
## Societies and arrows

In the eyes of Westerners, Bushmen have always been dependent on their weapons. According to travellers confronted with these populations and their material culture between the 16<sup>th</sup> and the 19<sup>th</sup> centuries, these instruments were more than others the focus of attention, to such a point that the image of the “Hottentot” became rapidly indissociable from that of his bow and quiver (fig. 1). During the first ethnographic surveys and the constitution of the first collections (during the 19<sup>th</sup> century), it was again very naturally this gear which was to be found in the display cabinets and shelves of museums. Then, among the works of ethnologists of the last 50 years, this hunting gear was again often at the centre of their preoccupation when looking into the material culture of the last Bushmen populating certain parts of the Kalahari Desert (fig. 2 and 3).

Beyond the techno-economic meaning of this category of artefacts, these ethnological approaches revealed the cultural and social substance of that category. We think for example of the works of Wiessner (1983), illustrating the fact that arrows and, strangely enough, arrowhead morphology, represent strong markers of group identity (fig. 4)<sup>1</sup>. Moreover, we know, since the works of Marshall (1976), Bieseke (1978) and Testart (1985), that among certain groups (the Kung in particular), the owner of the game that was shot down is not the hunter but the one who made the arrow that was used to kill the game. Indeed, during the sharing of hunted animals, the maker of the deadly arrow receives an important portion of the game or is appointed as the person in charge of distributing the carcass, while respecting the codes of the exchange system as practiced by these Bushmen groups. This exchange system, the *Hxaro*, is based on the donation

<sup>1</sup> - « The stylistic information contained in San projectile points was a good indicator of linguistic group boundaries » (Wiessner, 1983 p. 272)





**fig. 1** : Sample of illustrations from the 18th and 19th centuries representing Bushmen. From left to right and from top to bottom: a Bushmen family circa 1779; a Bushmen encampment in the Northern Cape region, drawing executed circa 1785 by Colonel Robert Jacob Gordon, commander of the Dutch garrison at the Cape, before the first British occupation of 1795; drawing by English artist Samuel Daniel who was accompanying Somerville-Truter's expedition in the interior of the Cape region in 1801; the following illustration, executed very probably at the turn of the 19th century, is a painting by the same artist, Samuel Daniel, entitled "Bushmen Hottentots armed for an expedition"; two Bushmen riding oxen and having been labelled "Tame Bushmen" by William Burchell, an English traveller who met and drew them in 1811 in the Karoo; the last plate, the work of C. D. Bell dated 1834, is supposed to represent Bushmen in a cave.



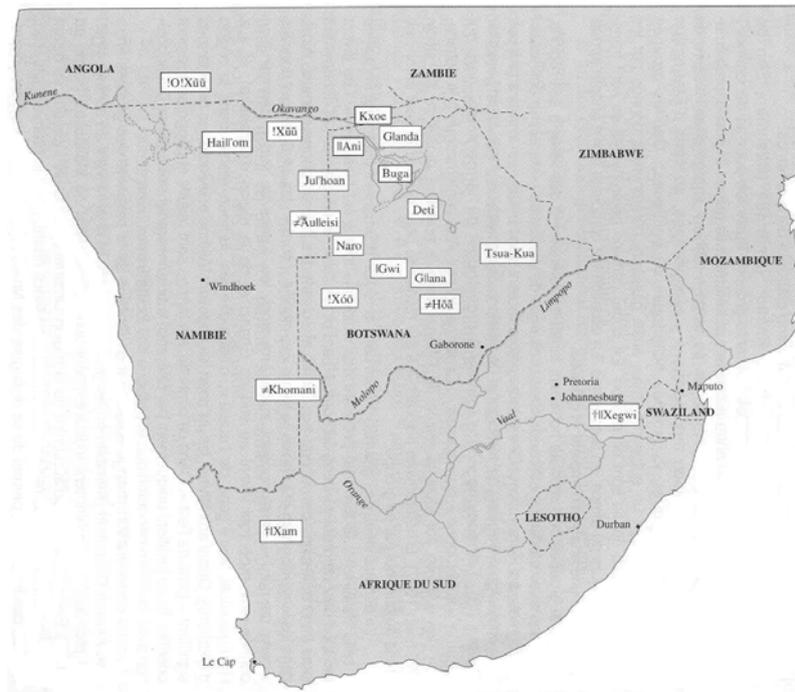


fig. 2 : Spatial distribution of current and sub-contemporary Bushmen groups (from Olivier and Valentin eds., 2005, p. 27).

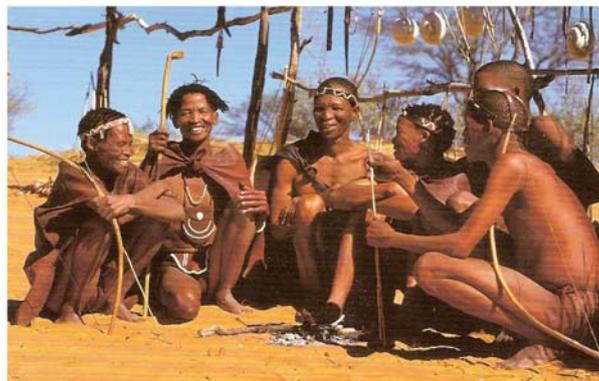
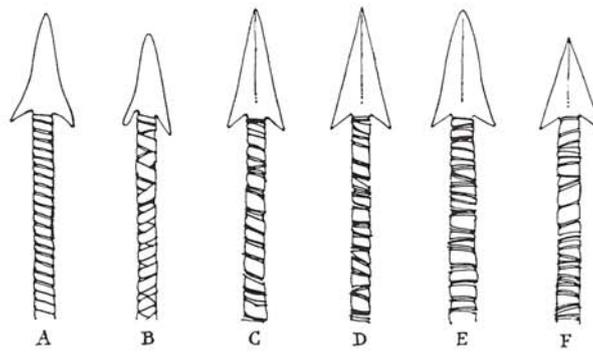
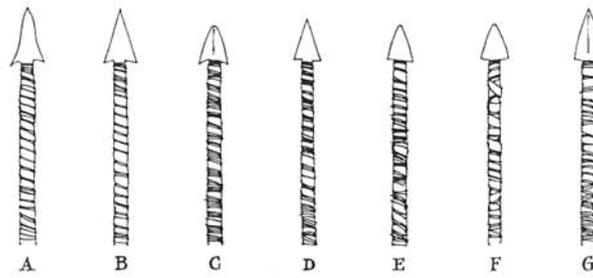


fig. 3 : Photographs of contemporary Bushmen living in the Kalahari (Botswana and Namibia).

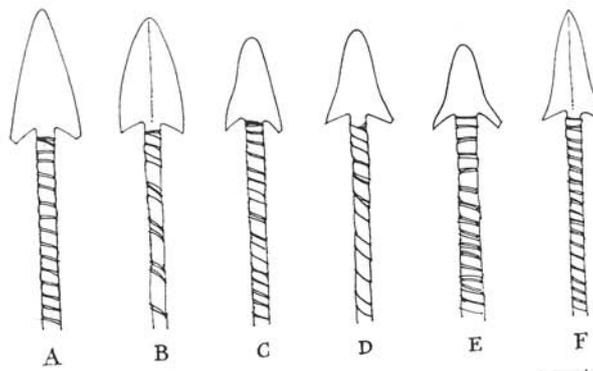




Variabilité des armatures G/wi San



Variabilité des armatures !Kung San



Variabilité des armatures !Xo San

fig. 4 : Variability among arrowheads belonging to several contemporary Bushmen groups, i.e. G/wi (top), !Kung (middle) and !Xo (bottom) (from Wiessner, 1983).



of objects and arrows, with a view to expressing the links between the members of a community. It codifies as such certain social rules, like those for overseeing food resource sharing and mutual assistance (Lee, 1979; Marshall, 1976; Testart, 1985; Wiessner, 1977). Thus, a hunter goes on an expedition with, in his quiver, arrows made by him as well as other hunters, thereby materialising the alliance network to which he belongs. These various aspects have contributed to making of Bushmen and their hunting gear references for ethnologists and prehistorians from around the world who drew from them, if not models, at least much food for thought.

### Bushmen arrows: documentary discordances

Yet, our own ethno-archaeological approach met with many obstacles. Indeed, while, on the surface, the various archaeological, ethnological and historical sources are becoming harmoniously coherent, this is partly an optical illusion; this play of mirrors, from one discipline to another, is rather similar to that of a kaleidoscope. For, in fact, each approach privileges in the other approach what it does not find in its own approach but, when they are compared on the same field, many documentary antagonisms are revealed. This is specifically the case of the hunting gear. For instance, ethnologists believe that they can draw from archaeology the idea according to which the populations they are studying are part of a centennial or even millennial tradition. But what of it, really? And when archaeologists and ethnologists agree to refer to today's Bushmen as the direct heirs of a prehistory that still exists, on what material reality do they base their assertions?

As far as hunting gear is concerned, the established image is that according to which the ancient populations of Southern Africa – the ancestors of today's Bushmen – were, up until the arrival of the first Western sailors then settlers (15<sup>th</sup> to the 17<sup>th</sup> centuries), stone-knappers, with stone being the material on which an important part of their technical equipment relied potentially. Then, and presumably very rapidly, the introduction of metal replaced the use of this millennial material,

which explains its scarcity as early as the 18<sup>th</sup> century, followed by its withdrawal during the 19<sup>th</sup> century. It is indeed around 1870 that the last stone instruments were observed, in the shape of arrowheads to be specific. These components, which date from the second half of the 19<sup>th</sup> century, among which glass which had already often replaced stone (fig. 5), are the only ones that survived to this day. While a serious documentary discrepancy exists between archaeological sources prior to the 18<sup>th</sup> century and subsequent ethnographic documents, this perspective nonetheless establishes the idea according to which technical evolution as implied by the appearance of metal, does not question the actual foundations of the tradition of the hunter-gatherer populations, having simply replaced one material with another.

But this fact alone has serious consequences while other components are confusing the evolutionary picture as each discipline is taking over. This is the case with, first of all, the fact that ethnological, archaeological and historical sources do not take up the same spaces: while ethnology relies exclusively on hunter-gatherer populations whose territories are today concentrated in the Kalahari Desert (fig. 2), historical sources concern mainly regions (the surroundings of the Cape of Good Hope and a hinterland restricted to a few hundred kilometres) where these populations disappeared for over two centuries. We thus project over the same plane populations that are not only separated by several centuries but also, in the worst case scenario, by one or two thousand kilometres. To draw only one of the conclusions of such a finding, we should highlight the differences that exist in terms of ecosystems between the various regions concerned (Sadr *et al.* 2006).

Then, historical sources testify to the joint existence of very different populations, nomadic pastoralists in this case. The societies gathered under the current name of Khoisan indicate indeed, through the past, a much larger complexity as regards socio-economic organisation, by comparison with the last representatives, i.e. today's Kalahari Bushmen and their hunting-gathering lifestyle.

All this justifies the opinion expressed in the





fig. 5 : Arrowheads fitted with glass splinters collected around 1870 (collections of the Iziko Museum, Cape Town).

introduction of this article: before thinking of using an ethno-archaeological approach such as that to which we aspired before undertaking our research work, it proved necessary to reverse our reasoning and to reflect upon the historical process that contributed to creating the current Bushmen populations (Fauvelle-Aymar *et al.*, 2007). What complex filters did their tradition go through? In this case, in the field which is of interest to us, this equates to trying to understand the genesis of their current hunting equipment, which is to a greater or lesser extent the fruit of several historical transformations.

#### Study corpus: study of arrow diversity

As important as Bushmen hunting equipment can be in the eyes of ethnologists and archaeologists, it turns out that we do not have any list gathering the large quantity of data

collected on them. Some of the research work was spent on describing, often very accurately, certain groups of arrows (cf. for example Clark, 1975-1977 or, in a completely different register, Vinnicombe, 1971)<sup>2</sup> and several detailed studies have been conducted on larger corpuses, the best known being those of Leakey (1926), Schapera (1927), Goodwin (1945) and Cooke (1958), although neither of these has truly led to a general typology of this ethnographic equipment. The most complete and recent research on the matter remains that of J. Deacon (1992), which does not really come to a classification, probably because it was not his initial objective.

Therefore, it remains difficult to appreciate the variety of these objects as well as to measure the representativeness of either among them in relation to all known specimens. Thus, to use a symbolic example, it is appropriate to wonder

<sup>2</sup> - Among the descriptions of certain groups of arrows, whether old or recent, cf. also: Van Riet Lowe, 1954; Valiente-Noailles, 1980; Webley, 1994; Liebenberg, 2001.



about the representativeness of the rare ethnographic specimens of arrows made from stone or glass: are they, as has been proposed so often (Goodwin, 1945; Clark, 1975-76-77; Deacon, 1992) representative of the equipment or, at least, of certain equipments prior to the appearance of metal, part of a millennial African tradition? By the same token, do these “mineral” equipments belong to a world apart, as opposed to the world of bone or metal arrowheads? Or can transfers or similarities in terms of sought after properties be flushed out, thus explaining the mechanisms of this alleged relation?

Before tackling the creation of today’s hunting gear, we felt it necessary to undertake the implementation of such a typological index. For this, our study relies on several fields: archaeological sources (traces of equipment etc.) and contemporary ethnological sources (current equipment of Kalahari populations) compared with historical descriptions and museum collections, the time cover of which is limited to the 19<sup>th</sup> century<sup>3</sup>. As regards ethnographic resources kept in museums, our study had access to two major collections, one from the MacGregor Museum in Kimberley, and the other from the Iziko Museum in Cape Town.

Our examination of these two collections concerned a sample of 1,145 arrows (167 complete specimens from the MacGregor Museum and 978 specimens from the Iziko Museum). In order to classify these objects, we adopted a descriptive and analytical approach that allowed us to recognise recurrent criteria. On examining each arrow in detail, we gathered all the elements required for the definition of these criteria. The various components identified are, concerning the head (French *armature*): the distal extremity, the body, the edges, the ailerons (wing tips), the base and the stalk. Concerning the rest of the arrow, we have recognised and described their various parts: the nock, the feathering, the shaft, the intermediary parts (spindle and *tube*), the ligatures and adhesives used, as well as the presence or absence of poison. Each one of these components shows great variability and we count for instance seven different types of nocks and five recognised forms of feathering (fig. 6; Bosc-Zanardo, 2004). It is the preferential associations

of these criteria which convey an ideal or an extreme type (Kantman, 1960; Tixier, 1963). Hierarchising these criteria makes it possible to recognise families, groups, types and sub-types.

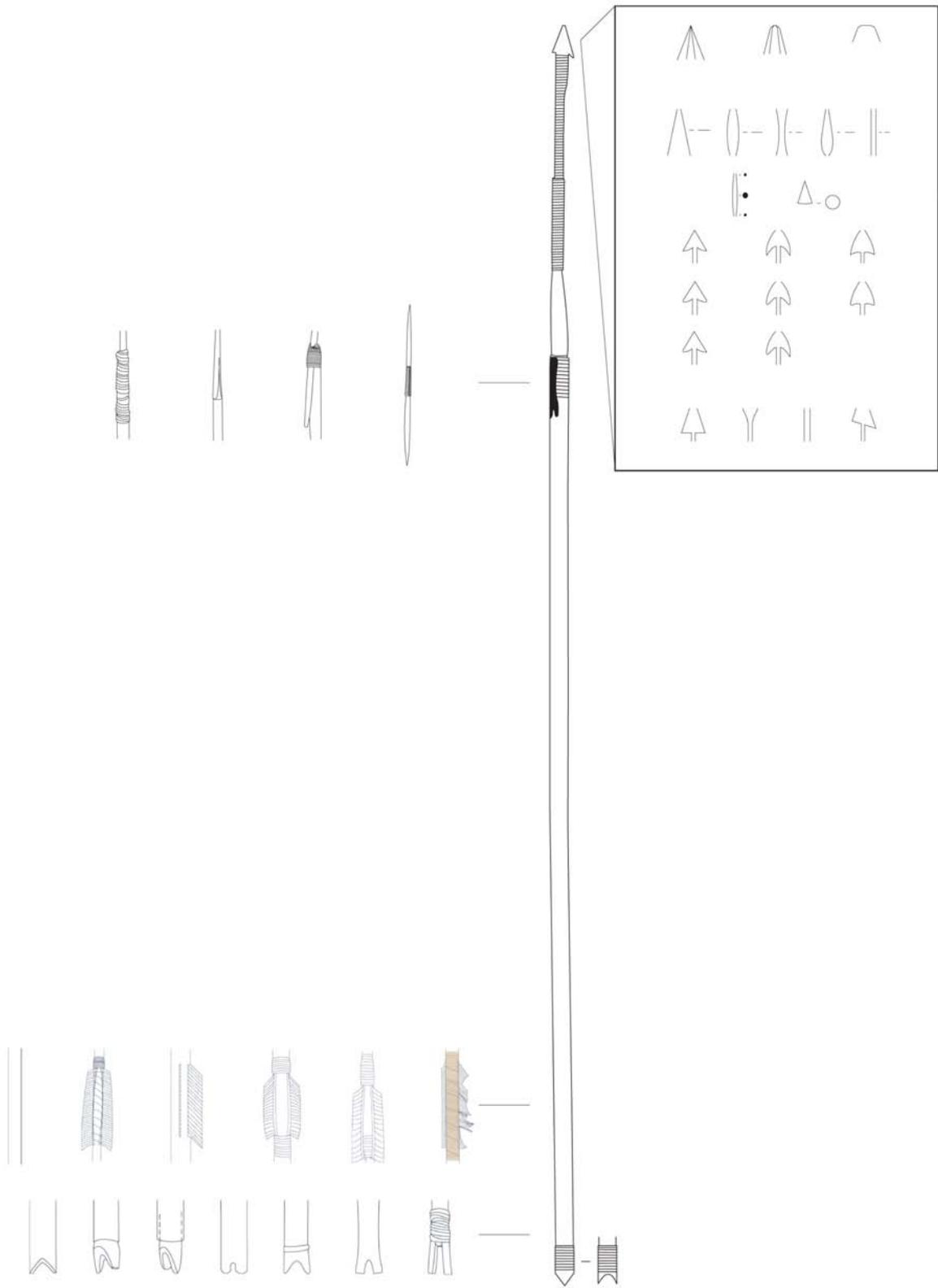
The application of the hierarchised grid to our corpus made it possible to define stable typological categories, most of which prove to be well structured (i.e. gathering a group of recurrent characteristics in a stable manner). We must however recognise that certain typological groups created in this manner are only represented by a small number of individuals which, at this stage, raises the issue of their representativeness.

One of the main objectives of this study is to show that there is a diversity of types which greatly exceeds that recorded among contemporary hunting gear alone. On the other hand, the latter, for the greater part, matches a restricted typological spectrum. Sub-contemporary and contemporary arrows are indeed grouped monotonously around the following criteria: triangular metal arrowheads (with variations in their morphology), associated to poison, with the use of a bone or wooden foreshaft, on light reed stick, devoid of feathering, with different nocking solutions (fig. 7). Yet, in the ethnographic collections that were analysed, covering a period and spaces far more important, this morphology is placed side by side with very different specimens (cf. for example fig. 8 above).

Another point deserves to be highlighted at this stage. The South African ethnographic collections of arrows are comprised of complete objects. However, the state of an archaeological object is more than often sketchy or abbreviated. Indeed, due to the nature of the objects being studied, most archaeologists’ typologies are based only on a portion of an object, i.e. mainly the head. Yet, we are all conscious that certain characteristics of an arrowhead depend undoubtedly on the arrow as a whole. Heads are directly linked to arrows, to bows and, by extension, to the people who make them, handle them, use them; but what meaning does the head have on its own? One of the outcomes of this study was therefore to be able to compare a typology based on complete arrows with data provided by

<sup>3</sup> - Before this, very few collections, if any, reached us, except for the artefact collected by Sparrman in 1775.





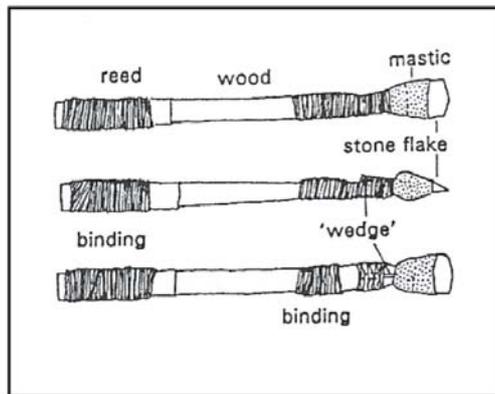
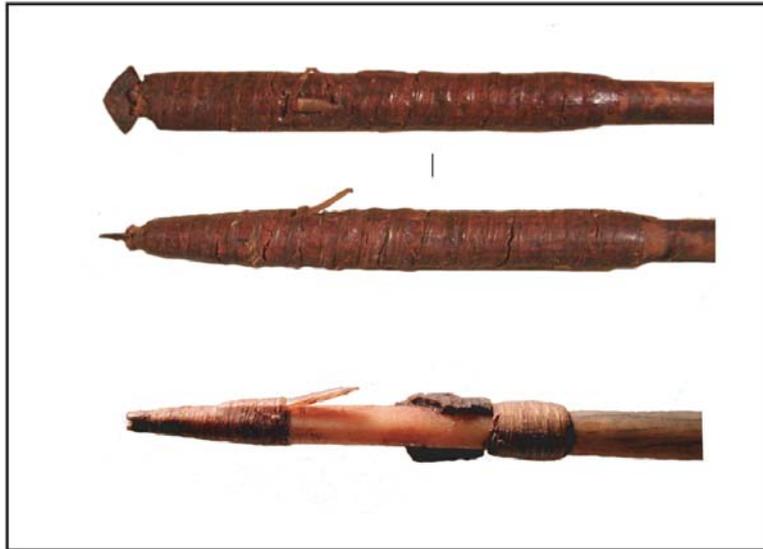
**fig. 6** : Variation of the main constituent characteristics of Bushmen arrows (based on the study of the ethnographic collections of the MacGregor Museum in Kimberley and the Iziko Museum in Cape Town; from Bosc-Zanardo, 2004).





fig. 7 : Specimens of arrows corresponding to the most common type among the current and sub-contemporary Bushmen populations of the Kalahari (collections of the Iziko Museum, Cape Town).





**fig. 8** : Top: arrowheads associating the piercing properties of a sharpened bone head with the cutting properties of a metal diamond-shaped head, and fitted with a micro-barb inserted in the distal ligature (collections of the Iziko Museum, Cape Town). Bottom: arrowhead fitted with a mineral cutting edge, recovered in archaeological context in Adam's Kranz Cave, Eastern Cape (from Binneman, 1994).



the arrowheads alone, to compare in fact an archaeological situation (concerning partially-kept objects – the head in this case) with the reality of the object (the complete arrow). On the same bases as our previous typologies, we thus created a typological index of the arrowheads alone, seeking afterwards to compare them with the classification of the complete arrows. We reached approximately the same result in terms of type definition: comparing the typological grid of the complete arrows with that of the heads alone certainly refines the latter's analysis, but confirms in most cases (85%) the distinctions operated. The arrowhead alone therefore remains a very discriminating component of the arrow as a whole, which is of particular interest to archaeologists.

A last remark concerns the fact that, as recalled previously, arrows are more than just functional objects: they transmit an important quantity of cultural and social information which, according to our study, remains partially within the reach of archaeologists, thanks to the representativeness of arrowheads alone. This is perhaps one of the reasons why it is not unusual to observe the transformation of a portion of the arrow, sometimes presenting strong technical contingencies, into a truly aesthetic motif. A simple example is that of the foreshaft, which is most of the time, in today's specimens, made of a hollow tube into which is inserted the stalk of the arrowhead on one side, and a wooden spindle, itself inserted into the distal part of the shaft, on the other side. But certain arrows in fact have an entirely sculpted monoxylous part, imitating the tube and the spindle, carrying details to the point of reproducing the ligatures by the way of incisions. Finally, what emerges from our analysis is that all the parts of an arrow have the potential to become motifs, *signs*, like what has been brought to light by P. Wiessner as regards arrowhead shapes (1983; fig. 4).

### From diversity to order: first outline of arrow morphology

As mentioned above, our analysis highlights the great diversity of the arrows attributed to Bushmen populations (*sensu lato*) and which were collected during the 19<sup>th</sup> and 20<sup>th</sup> centuries, conveying a variability which is more important

than what one would have suspected from examining (sub-) contemporary pieces alone.

If we focus our attention on arrowhead morphology, or at least on the distal part of the projectile, by accepting during the preliminary phase – to which this article is dedicated – to disregard the rest of the arrow (shaft, foreshaft, feathering, etc.) as well as the presence or absence of poison, it is to work out a classification based on the search for radically different wounding properties, which have often been used to distinguish arrowhead morphologies: we are referring specifically to *piercing* or *perforating* shapes as opposed to *cutting* or *lacerating* shapes. In the remainder of this section (fig. 9), we will be referring to these morphotypes by using the abbreviations P (piercing) and C (cutting).

Morphotype P is represented by « darts », i.e. highly-sharpened bone or metal arrowheads (fig. 9, left). Morphotype C is represented by metallic half-circular or quadrangular arrowheads (fig. 9, right). Besides these objects, other arrowheads embody both properties: these can be diamond-shaped (fig. 9, bottom) or spatula-shaped (fig. 9, top). Concerning spatula shapes, due to the rounded morphology of their extremity, they should be classified under morphotype C, but the very slender nature of the arrowhead, on the whole, associates them undeniably with deep perforating properties. Thus, although the properties of morphotypes P and C show a high contrast, we have to understand that these different shapes are in fact part of a *continuum*. In other words, it means that some arrowheads are exclusively piercing while others are exclusively cutting, although many arrowheads combine both properties, with a “balance point” being reached with diamond shapes in particular.

Moreover, each one of these shapes can be combined with retention properties. Triangular as well as “dart”, half-circular or spatula shapes then can have ailerons<sup>4</sup> more or less well-developed. There again, these different shapes are part of a *continuum*, the epicentre of which corresponds to the triangular shape with ailerons which represents the balance point between piercing, cutting and retention properties (fig. 9, centre).

<sup>4</sup> - We decided to establish a distinction among triangular-shaped arrowheads depending on whether or not they have well-developed ailerons, which most typologies elaborated by prehistorians tend to assimilate, particularly in the context of Neolithic studies.



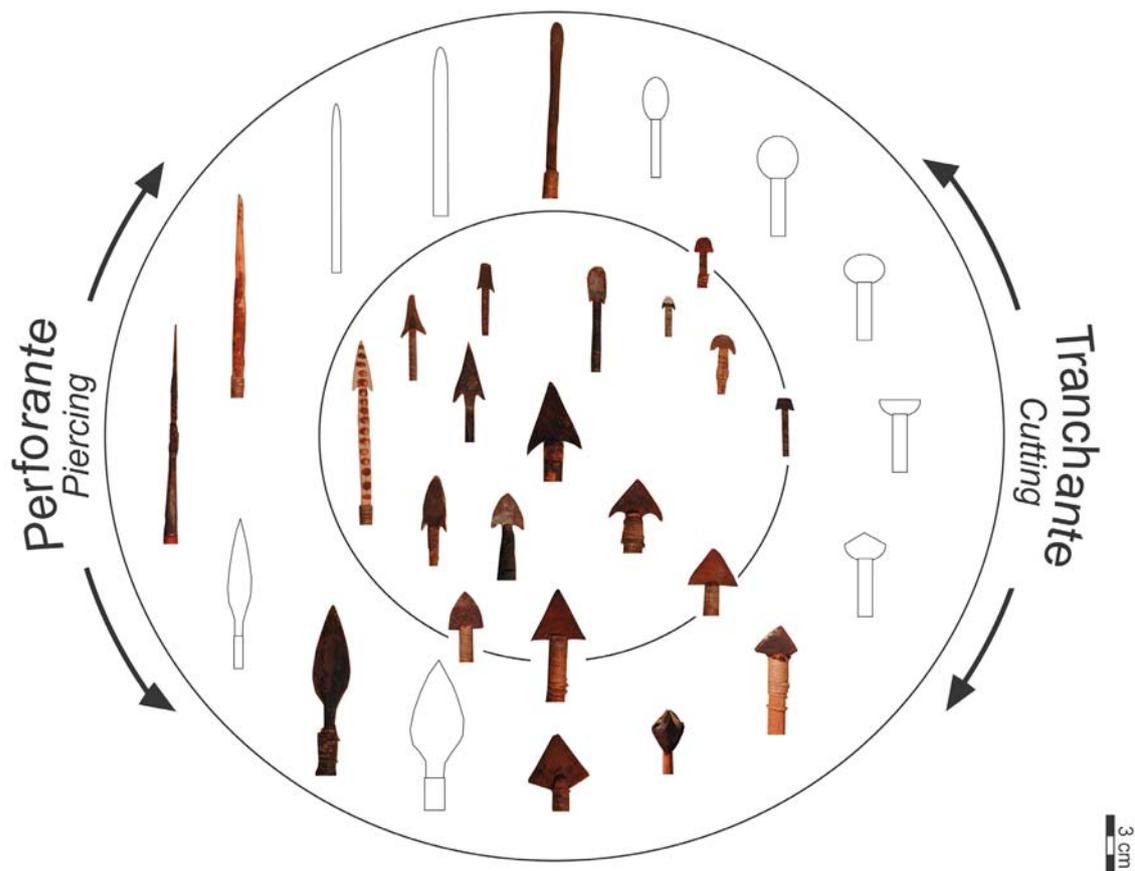


fig. 9 : Attempt at classifying morphologically a sample of arrowheads, as per the search for specifically piercing properties (left), cutting properties (right), combined properties (middle), non retentive properties (external border) or retentive properties (internal circle). Photographs: ethnographical artefacts; drawings: theoretical forms.

In short, this analysis allows us to retain the following morphotypes:

- On the one hand, pieces shaped specifically for cutting (metallic half-circular or quadrangular arrowheads) and others specifically for perforating (bone or metal “darts”). Both morphologies can combine with retention properties, either by adding a micro-barb tied up along the arrowhead (as can be seen on the “dart” model), or by making ailerons (as seen on the “cutting” model).

- On the other hand, morphologies that combine all these properties.

Among these, two models of arrows can be distinguished in turn:

- The first corresponds to the association of different elements each contributing to obtaining one of the properties concerned. This is the case of highly-

sharpened bone arrowheads (perforating component), at the extremity of which a minuscule metal arrowhead is inserted (cutting component) and equipped, a little distance away from that extremity, with a micro-barb (retention component; fig. 8 top). One could object that the insertion of a metallic arrowhead with a cutting shape (half-circular) at the extremity of these arrows should bring us to classify them under morphotype C. But, following the example of “spatula” shapes (cf. *supra*), the very slender nature of the bone arrowhead on which the metallic element is inserted, as well as the dimensions of the latter (which barely exceed the width of the bone arrowhead), highlight the fact that a perforating property was being looked for.

- The second corresponds to the integration of all these properties from one object only: the triangular arrowhead with ailerons.

## Elements to be used in the history of arrowheads in Southern Africa

It turns out that this reflection on the combination of different properties, structuring the definition of different types, can perhaps be used to interpret some of the main phases taking place in the manufacturing history of these projectiles during the last three centuries.

Arrowheads showing morphologies found at the two extremities of the spectrum – i.e. on the one hand, darts with a specifically piercing morphology and, on the other hand, exclusively cutting armatures – are those we can more easily identify as part of the equipment of Khoisan populations prior to the 19<sup>th</sup> century.

Thus, concerning morphotype P, bone arrowheads (most often made from ostrich thighbone), are the most commonly used projectile component recorded in archaeological contexts (e.g. Smith and Poggenpoel, 1988). We have every reason to believe that it corresponds indeed to some ancient tradition: we know of bone arrowheads from the Oakhurst Complex (*circa* 12,000-8,000 BP) and we find them thereafter in all the faciès of the Wilton Complex (Sampson 1975, *passim*). The oldest written sources date from the 15<sup>th</sup> century: the first Portuguese testimonies mention indeed highly-sharpened bone or wooden armatures (although these heads might be used more for assegais than for arrows). Bone arrowheads are also found in the artefact collected by Swedish naturalist Anders Sparrman in 1775 (Rudner and Rudner, 1957).

Concerning cutting and, in particular, half-circular morphologies, they are described with remarkable consensus by the travellers of the beginning of the 18<sup>th</sup> century. A German resident in the Cape Colony, Peter Kolbe, describes Hottentot arrows being “fitted with a semi-circle of iron, the size and shape of an *escalin*, or *six sous* coin, cut in the middle, and as thick as a standard knife blade” (Kolbe, 1746, tome 1, p. 157)<sup>5</sup>. The existence of

arrowheads reflecting the specific search for one property or another is therefore well confirmed for phases prior to the 19<sup>th</sup> century.

Furthermore, during the same period, each one of these morphologies can be combined with a retention property. Kolbe, once more, refers to the “semi-circle, or rather half-moon” head previously described as being “barbed, with a small hook at each angle, inward and outward” (Kolbe, *op. cit.*), while Sparrman specifies that, on some of the bone arrowheads which he saw being made, “at the distance of an inch or two from the tip of this bone, a piece of a quill is bound on very fast with sinews (...). This is done, in order that the arrow shall not be easily drawn out of the flesh” (Sparrman, according to Rudner and Rudner, 1957).

However, prior to the 19<sup>th</sup> century, we find very little evidence of projectiles combining all these properties (piercing, cutting and retentive), at least in the shape of triangular arrowheads with ailerons: such objects are not described by the travellers of the 17<sup>th</sup> and 18<sup>th</sup> centuries and it seems in fact that they appear much later, i.e. during the 19<sup>th</sup> century. Nevertheless, such a combination could have been inaugurated previously in the shape of arrowheads made with a bone head, fitted with a micro-barb ligatured on its shaft, and topped by a small metal head inserted on the extremity, taking on a triangular or, more often, half-circular shape (Deacon, 1992; Vinnicombe, 1971). This head is described by Sparrman, and we find it in several of the oldest collections, i.e. in those going back to the 1820s (fig. 8 top)<sup>6</sup>. As already pointed out, to us this head represents an illustration of the search for a combination between cutting (half-circular head), piercing (bone shaft) and retentive (micro-barb) properties.

<sup>5</sup> - Peter Kolbe's text, which is originally in German, is surprisingly similar to a legend handwritten in Dutch and used on a drawing of the end of the 17<sup>th</sup> century which is kept at the South African Library of Cape Town (drawing and legend edited by Smith and Pheiffer 1993: 60-61). The text reads as follows: “The arrows [of the Khoikhoi] are fairly flat like a thin and non-sharp knife, but like a half-moon, and with a hook on each opposite side, almost like an angle, as sharp as a pocket knife or a blade, [the head being] almost as big as a kayser-groschen broken in half or a half batze”. The kayser-groschen is a currency of the Holy Roman Empire; the batz or batzen is a Swiss silver coin minted since the 15<sup>th</sup> century and initially representing a bear (batz, bätz...). In the canton of Berne, a half batzen is, in 1718, a billon of 23 mm. The batzen or half-batzen of the canton of Vaud or the Helvetian Republic came later (19<sup>th</sup> century) but remain in the 22 mm to 25,5 mm range. This very precise description clearly shows the half-circular shape of the armature and its size (slightly wider than 20 mm).

<sup>6</sup> - The components of a quiver kept at the Museum of the Morija Mission (Lesotho) also correspond to this type of arrows. The quiver was obtained from an old Bushman couple by H. Dieterlen in that region around 1880 (Archives of the Morija Mission).



There is every reason to believe that this type of object embodies the search for technical solutions that, subsequently, during the 19<sup>th</sup> century, found their outcome in a morphology which integrates, as one and the same piece (and not by combining three separate components), all these parameters: the triangular head with stalk and ailerons. The development of the triangular head, made of bone or metal, constitutes perhaps the most significant evolutionary tendency of the morphology transmitted to Bushmen hunting gear during the 19<sup>th</sup> and 20<sup>th</sup> centuries. If this hypothesis is correct, we could then measure its genesis by syncretism and the successive adoption of several technical solutions combining characteristics that were previously dissociated (fig. 10).

### From stone to metal

Can this reflection shed new light on the rare arrows fitted with glass or quartz fragments found in the ethnographic collections gathered around the 1870s (cf. *supra* and fig. 5)? In other words, can our analysis find similarities, from the viewpoint of the properties being sought, with the specimens fitted with metal or bone of which we have tried to relate the history? And are we in a position to bring a few clues in favour of their potential meaning in the evolutionary outline we have just proposed? The properties offered by each one of the small stone or glass components that constitute the wounding section of these arrowheads, are mainly cutting properties. It is their symmetrical position, i.e. oblique compared to the axis of the arrow, which

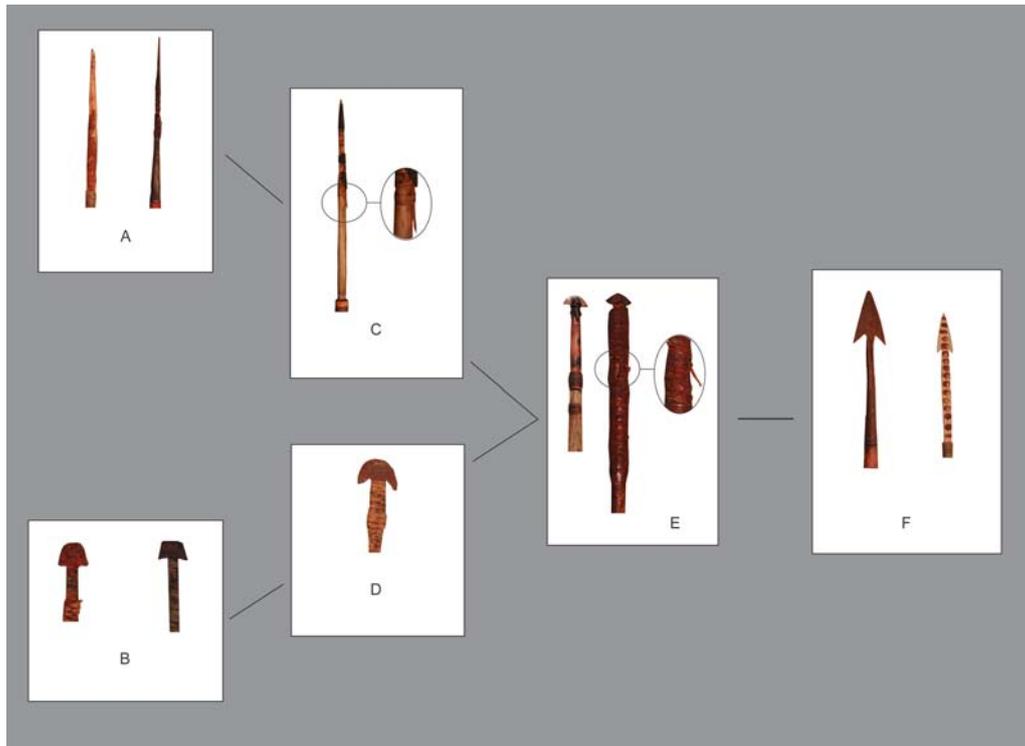
gives the latter a triangular extremity and, therefore, a sharpened silhouette. However, the mounting system used and the layout of the filler show that what was sought for in these arrowheads, was not so much the piercing as the cutting characteristic. The search for a cutting property is a component which, we feel, is very important to highlight, as it is this property which makes it possible to establish different connections:

- firstly, the search for a cutting property mirrors the rare historical descriptions of arrowheads fitted with stone, which emphasize above all the cutting properties offered by obtaining small fragments of quartz (vein and crystalline) or chalcedony<sup>7</sup>. Moreover, and turning now to archaeology, industries during the last two millennia in Southern Africa are frequently dominated by quartz debitage on anvils, producing micro-flakes, with one of the purposes potentially being the search for cutting properties (Fauvelle-Aymar *et al.*, 2006). In line with this hypothesis are the rare specimens of arrowheads fitted with lithic components which are kept in the archaeological register, and which correspond to cutting specimens (cf. Binneman, 1994; fig. 8, bottom). Whatever the case, these “unformal” industries (as per South African terminology) do not in any way offer technologies that make it possible to obtain monolithic arrowheads, e.g. arrowheads with stalk and ailerons<sup>8</sup>. The simplicity of technologies, in terms of lithic production, could therefore go with the search for properties that are above all cutting properties and, especially, with the use of composite elements: the intrinsic simplicity of which could be compensated by the existence of elaborate assembling and fixing solutions.

<sup>7</sup> - Among the main historical and ethnographic quotations on the use of stone in the manufacture of projectiles, is the testimony of Wikar, a Swedish soldier who lived with Khoisans on the banks of the Orange River between 1775 and 1779. He indicates that certain arrows were fitted with “sharp-edged white stone” and adds that the use of stone rather than metal would be due to the fact that “the stone often breaks into pieces in the body of the game” (Mossop, 1935). One century later, Dale (1870) described an arrow picked up by Palgrave in the region of the Orange River, bearing “a small leaf-shaped flake made of quartz crystal”. During the same years, Dunn (1873) reported on how an old Bushman from Bushmanland “showed the manner in which arrowheads are deftly broken by striking one stone with another. At first a few light strokes are given to guide the fracture. Two small chips, whose sharp points are exactly of the same form and size, are cemented to the arrow tip, one on each side. The points of these chips must coincide to form the piercing end”. This description is very close to that which we can make from the projectiles manufactured at Bleek’s request, by Bushmen prisoners, and of which we had the opportunity to study a few specimens at the Iziko Museum (fig. 5). Concerning one of the rare specimens fitted with stone and not glass, Bleek had moreover recorded the following comment from one of his /Xam informants, by the name of Jantje: “This is witteklip [white stone]. We use it. We fix it into the end of a reed. It is not real Witteklip, but is a stone that is like a diamond ». Finally, Leith (1898) declares that “Mr Allan at the lighthouse at Mossel Bay frequently saw arrows tipped with such flakes (vitreous quartz) used by Bushmen in Namaqualand 30 years ago”, while Stow reports (1905) that during his first visits in 1876 in the lower valley of the Orange River, “the Bushmen there invariably used small chips of chalcedony for making the points of their arrows” (quotations gathered by Goodwin, 1945; Rudner, 1979; and Binneman, 1994).

<sup>8</sup> - Nevertheless, while these are not totally absent from the prehistory of Southern Africa, they belong to contexts that are, it seems, definitely older than that with which we are dealing and which concerns the last centuries.





**fig. 10** : The evolution of Bushmen gear from the 18th to the 20th centuries: scheme of arrowhead transformation based on criteria of dissociation/combination of piercing or cutting properties, with or without retention systems. A: Bone or metal piercing arrowheads; B: Metal cutting arrowheads; C: Bone piercing arrowhead with a retentive micro-barb; D: Metal cutting arrowhead with ailerons; E: Bone point with metal cutting head and retentive micro-barb; F: Metal triangular arrowhead with ailerons.

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- In parallel, the search for cutting properties from lithic pieces enables us to make a connection with certain metallic specimens. Indeed, the morphology of these arrowheads, which could be described as that of a barely sharp head corresponding in fact to the joining of two oblique cutting edges, finds precisely its equivalent in certain metal specimens. These are triangular arrowheads, isosceles or flat in shape, the extremity of which seems to be less wounding than the edges which are finely sharpened. More generally, the hypothesis we defended above is based on the assumption that metallic arrowheads (half-circular, quadrangular etc.) prior to the 19<sup>th</sup> century, as opposed to bone arrowheads, favour indeed the search for a cutting property. In this context, it is therefore tempting to make a parallel between stone and metal, around the search for the same properties. The fact that cutting shapes came earlier than piercing shapes or shapes combining these two properties (triangular arrowheads with stalk in particular), can perhaps find an explanation through this comparison. This is not in contradiction to the fact that metal led

to the elaboration of previously unseen shapes, while fulfilling the search for similar properties. As such, metal could have led to heads with integrated shapes (half-circular and quadrangular), where stone required the juxtaposition of several components; some of the forms obtained with metal (half-circular shapes in particular) were indeed beyond the reach of earlier or contemporary stone technologies.

#### Highlighting a technical continuum

In light of these different hypotheses, the evolution of the hunting gear of Southern African populations during the last centuries could be seen as the progressive integration of properties that were not previously associated. As such, the production of metallic arrowheads combining piercing and cutting properties, gradually replace bone arrowheads that were sought for their piercing properties, side by side with stone arrowheads sought mainly for their cutting properties. But this evolution took place by first favouring the replacement of stone with metal,



then fulfilling the search for a similar cutting property. Bone, embodying a piercing morphology, resisted longer before iron arrowheads began to dominate, following a formula integrating, this time, all the properties into one single object, at the cusp of the 19<sup>th</sup> and 20<sup>th</sup> centuries<sup>9</sup>.

Were they to find confirmation in future typological and techno-functional studies, our hypotheses on the evolution of Bushmen hunting gear would illustrate a history more complex than that of a simple “conversion” to metal, accompanied by an “adaptation” favouring a transformation of the weapons’ wounding properties. In reality, as seen previously, metal supply might have acted as a technical *catalyst*.

This evolution raises two series of questions.

First, why did such a phenomenon occur? Why did triangular arrowheads with ailerons become the morphotype crystallising the technical evolution of Bushmen societies during the last two centuries? Why and how did the adoption of metal accompany this transformation? This evolution undoubtedly reflects the increasing influence of external inputs on these societies. As such, it appears that metal begins to become generalised from the end of the 17<sup>th</sup> century among the Khoikhoi cattle keepers of the Western Cape, as soon as they came into contact with the settlers (according to Kolbe’s evidence in particular), while one century later, Sparrman could still gather bone specimens in the eastern confines of the Khoikhoi world. Our luck, as far as Southern Africa is concerned, is that this evolution took place during the last few centuries, and we can therefore envisage that a detailed analysis of the available archaeological, historical and ethnographic data will inform us as much on the pace of the processes concerned, as on the phenomena of geographic circulation, innovation, borrowing and re-appropriation accompanying such processes. In this study, the role played by war or, at least, by armed conflicts that multiplied and underwent a change of meaning during the 19<sup>th</sup> century, will not be undermined: they then take

on the dimension of a fight to the death, to which the texts and memory of the settlers as well as the wall paintings of populations, often reduced to silence, often bear witness.

Secondly, if the relative homogenisation of the technical solutions and materials used seems to be the dominant feature of the arrowhead technology during the very last centuries, the variability and even the discontinuity of previous techniques remains to be interpreted. What meaning does this diversity take on? Is it the reflection of a cultural mosaic far richer than what it became, due to the disappearance of many Bushmen populations during the colonisation? In other words, does this diversity reflect as many vanished groups, of which only the Kalahari populations and their equipment would have survived? Or does it illustrate complex mechanisms of Bushmen society transformation during the last centuries, of which the technical equipments would bear the mark? These two hypotheses are not in contradiction, especially if we tackle them through the following question: What role should we attribute, in this diversity and these technological evolutions, to the economic divide opposing hunter-gatherers and cattle breeders? In this regard, let us simply observe that semicircular metallic armatures with ailerons seem to be associated, at the beginning of the 18<sup>th</sup> century, with a very specific context of highly specialised cattle keepers, among whom hunting might have been only a supplementary activity (Fauvelle-Aymar 2004). Yet, are we really in a position to link these types of arrowheads with specific hunting techniques that, in addition, are likely to identify Khoe pastoralists vis-à-vis San hunters, whose reality of distinction has been a nagging issue of Southern African prehistory?

Irrespective of these different hypotheses and questions, the rapid evolution of arrowheads towards a metallic model associating piercing, retentive and cutting properties (triangular head with stalk and ailerons) could represent the materialisation of a double phenomenon – linked to colonisation – of generalisation of raw material

<sup>9</sup> - However, it seems that the use of bone “darts” was maintained from time to time until the last decades of the 20th century (B. Smith, personal communication).



(metal) and reduction of hunting territories with, in the background, conflicts and the transfer or disappearance of populations. All these questions only aim to highlight the importance of detailed typological studies, which will need to be combined with the study of other aspects (presence or absence of poison, bow strength etc.) and with other archeo-historical data. In any case, this preliminary approach insists on the necessity to adopt such a historical hindsight, before considering the meaning of the contemporary Bushmen weapons.

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