A Chrono-Typology Study of Metal Arrowheads at Barikot (Bīr-koṭ-ghwaṇḍai), Swāt, Pakistan

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Abstract

The archaeological examination of arrowheads plays a significant role in understanding technological advancements, offering perspectives on the evolution of weaponry, and shedding light on hunting and warfare practices. The rigorous analysis enables researchers to extract crucial details about craftsmanship, material utilization, and societal behaviors, thereby enriching our comprehension of past civilizations. Notably, the ongoing excavation of the urban site of Barikot in Swat, Pakistan, since 1984 has unearthed a diverse assemblage of arrowheads. This article employs a systematic approach to provide a chrono-typology, categorizing these artifacts and conducting a thorough analysis of their morphology to elucidate morphological changes over time.

Keywords: Swāt (Swat); Barikot; Arrowheads; Metal; Chrono-typology.

1. Introduction

The study of material culture is a cornerstone of archaeological research, providing invaluable insights into the past through the examination and analysis of artifacts, structures, and other physical remains left by human societies. Material culture encompasses the tangible aspects of human existence, that shed light on the technology, social organization, and daily practices of human societies. Among the diverse array of archaeological artifacts, arrowheads stand out as crucial components for understanding human history and technological evolution.

These small projectile points represent not only technological advancements but also offer clues about subsistence strategies, hunting practices, and even symbolic or ritualistic aspects of ancient societies. Regrettably, in many cases, they did not receive due recognition.

The bow, used by many cultures throughout history, was a critical tool for hunting and warfare until the introduction of firearms. The bow, as one of the first projectile weapons capable of storing energy, exceeded earlier hand-thrown in terms of power and effectiveness, becoming indispensable for both combat and sustenance. The significance of bow and arrow, as documented in various written and oral histories, artistic representations,

literature, and folklore, can be seen in the numerous archery traditions and practices that continue today (Grayson et al. 2007).

Variations in bows and arrows over time and space are caused by a multitude of factors, such as the materials and tools used to make them, the environment in which they are used and the purpose for which they are made.

This weapon is rarely discovered in archaeological sites due to the perishable quality of its majority components, with the exception of the arrowhead. Fortunately, arrowheads, with their distinct shapes, sizes, and manufacturing techniques, exhibit a variety of characteristics that make them highly valuable artifacts in archaeology. These artifacts have the potential to reveal many aspects of historical contexts. They offer insights into the past by shedding light on the environment in two crucial ways. First, they provide information about access to natural resources used in crafting arrowheads. This shed light on the technological capabilities and resource availability of past societies. Second, these artifacts provide insight into ancient communities' interactions with their natural surroundings, particularly regarding nutrition and dietary practices.

Furthermore, these artifacts can provide information about the movement of populations and their interactions with others. Whether through war, immigration, or trade, studying these aspects can help trace the diffusion of technological innovations across different regions and communities, offering a comprehensive view of how technologies spread and evolved over time.

Through a comprehensive examination of arrowheads and their classification according to material, typology, chronology, and regional differences, it is possible to offer new perspectives to help in the reconstruction of diverse elements of historical, social, economic, and technological conditions.

2. Arrowheads at Barikot

Barikot (Bīr-koṭ-ghwaṇḍai), located in the Swat valley in north-west Pakistan, is an urban archaeological site that has been excavated and studied by the Italian archaeological mission since 1984. The Italian archaeological mission’s activities that are still ongoing, under the direction of by Prof. L.M. Olivieri, have generated a significant stratigraphic sequence spanning from the Chalcolithic period to the 20th century (Olivieri 2020: 3-7; 38-41, Table 3). A total of 180 metal arrowheads were discovered during the

archaeological excavations in Barikot, spanning from the first campaign to the year 2022. Although a significant portion of the objects were discovered in a fragile and extremely rusted condition, rendering it challenging to recognize their shape. Hopefully, a remarkable proportion of them maintained their original form. Considering this condition, in order to organize a systematic investigation of arrowheads, a two-step study was arranged. Initially, by examining arrowheads that retained the essential traits of structure, a typology of arrowheads is established. This paper presents the outcomes of this step. As previous studies on Barikot's findings (Alterio, Esposito 2020; Colliva 2019) have been published in this journal, the preliminary result of this research is provided here.

A total of 101 arrowheads were examined in the initial phase. Arrowheads are exclusively from stratigraphical archaeological contexts that provide valuable chronological information. All the arrowheads, except for one crafted in copper alloy, were made in iron. Arrowheads have been found throughout a wide range of time, from the 2nd century BCE to the 15th century CE (Alterio 2018/2019; Esposito 2018/2019; Alterio and Esposito 2020; Colliva 2012; 2019; Olivieri 2014; 2020; Rabbani 2022; Personal communication with Prof. Luca M. Olivieri and Dr. Elisa Iori).

The earliest evidence of metal arrowheads at Barikot is represented by a group of 14 arrowheads that have been found in contexts dated from the 2nd century BCE to the 1st century CE and attributed to the Indo-Greek and Indo-Scythian periods. Most of the arrowheads, comprising 70 in total, were discovered in archaeological contexts associated with the Kushan period, which ranged from the 1st to the 4th century CE[1]. A total of 24 arrowheads have been discovered in various contexts dating from the 4th century CE to the 15th century CE. However, within this group, 10 arrowheads were specifically found in contexts that date back to the 8th and 9th century CE.

As regards their spatial location, a total of 11 arrowheads were discovered on Acropolis Hill (specifically in BKG 6, BKG 9, BKG 14, and BKG 15), while the remaining arrowheads were found in the trenches situated in the lower town (Fig. 1). On Acropolis Hill, arrowheads have been found in contexts dating from the 8th to the 9th century CE, likely

[1] During this period, another discovery concerning military artefacts is 107 iron fragments of scale coats or armours. They were found in the fortified city, namely in trenches BKG 1, 3, and 4-5, in archaeological contexts that have been dated to the period between the 2nd and 4th century CE (Olivieri 2011).

associated with the fortified hill settlement during the Turk-Shahi period, while in the lower town, archaeological evidence of a defensive wall has been discovered dating from the Indo-Greek period to the Kushan period (Olivieri *et al.* 2019; Coloru *et al.* 2022).

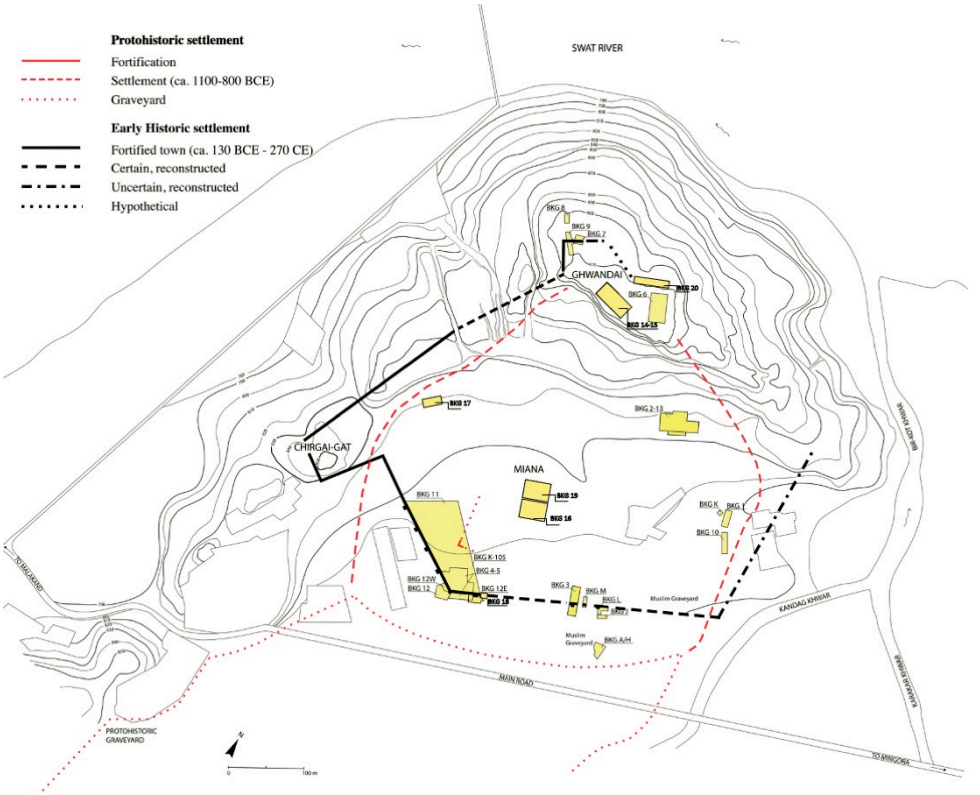

Fig. 1 - Map of Barikot: the location of trenches excavated from 1984 to 2022. (After Olivieri et al. 2022).

In the subsequent phase, the rest of the arrowheads will be studied in relation to the outcome of the first step, i.e., the chrono-typological framework. This framework will be utilized to categorize and evaluate the classification of the arrowheads that are in a poor state of preservation condition. Proposed modifications or additions to the typology will be made, and the typology will be enriched with additional data, whether

quantitative, qualitative or both, to improve the interpretation of the arrowheads found in Barikot.

3. Typology

The study of arrowheads relies on a systematical description to establish analytical classes that can be compared to existing descriptions of archaeological types (Mahzounzadeh, Bortolini 2020).

Through the documentation of arrowheads following a detailed and systematical approach, various cross-section's shapes of the arrowheads' blades and bases[2] have been registered. The arrowheads' base cross-section were oval, circular, rectangular, and square shapes. In this study, the oval and circular cross-sections have been classified together due to their analogous aspects. Likewise, the rectangular and square cross-sections have been grouped together. Firstly, considering the process of craftmanship (typically, forging) and the close similarity between each of these two forms, it is challenging to attribute significant meaning to the slight differences. Secondly, iron archaeological artefacts undergo changes over time, becoming deformed, and covered with oxidation products that can make it challenging to distinguish such a slight difference accurately. From my perspective, considering the number of artefacts, the production process, and the characteristics of iron indicate that minor variations are more likely to cause confusion in classification and analytical errors rather than providing significant distinctions.

The approach employed in delineating types, sub-types and variants relies on the indicators of change in morphology or function over time. These indicators may manifest as a set of characters or singular specific character that marks a specific group of arrowheads. These arrowheads are classified based on criteria such as material, blade cross-section, dimensions, ratio of structural features, blade shape, and the presence of specific attributes.

In a comprehensive study of 101 metal arrowheads discovered at the archaeological urban site of Barikot, 6 types (A, B, C, D, E, and F), 7 sub-types (A.I., A.II., B.I., B.II., B.III., C.I., and C.II), and 7 variants (A.II.1., A.II.2., A.II.3., B.II.1., B.II.2., B.III.1., and B.III.2.) have been identified. The majority of these arrowheads (100 out of 101) are crafted in iron,

[2] The blade is the cutting part of the arrowhead that includes tip and in some cases midrib, barb and boss. The base is the supporting part of the blade, which can be a socket or a tang. For the terminology of structural elements of an arrowhead see Mahzounzadeh, Bortolini 2020.

representing types A, B, C, D, and E, while a single arrowhead, made of copper alloy, belongs to type F. The critical aspect to division of types A, B and C is primarily the cross-section of the blade and subsequently for the sub-types and variants is the dimension of the arrowhead, the ratio of its structure features and the shape of the blade. Types D and E are differentiated by unique features such as the presence of a stem, barb, and/or double-blade.

A. Rectangular/Square-head tanged arrowheads

42 iron arrowheads represent this type. Arrowheads with rectangular or square-head and tang have persisted throughout various periods in Barikot. Different cross-section shapes of tang are in this type, such as oval/circular or rectangular/square shape. Taking into consideration that forging a four-sided arrowhead requires considerably less time than producing a rounded variant, and notably, a tri-bladed arrowhead, the continuity of this tradition across time appears plausible. Most of these arrowheads have been unearthed in the archaeological contexts dating back to the Kushan period, spanning from the 1st to the 4th century CE (Fig. 2).
Sub-types and variants of these arrowheads are:

A.I. Rectangular/Square-head with oval/circular tang

This sub-type is characterized by 6 iron arrowheads that have predominantly square-heads, circular tangs, and lanceolate blade shapes. Their length ranges from 6 to 3.5 cm and their weight ranges from 7 to 10 gr. One of them has a weight of 30 grams, which is uncommon but not particularly rare. These artifacts have been discovered in archaeological contexts associated with the Indo-Greek settlements, dating to the late 2nd century BCE (Fig. 2).

A.II. Rectangular/Square-head with rectangular/square tanged

A total of 36 iron arrowheads have been identified in this sub-type. They have been divided into 3 variants in order to gain a deeper understanding of the alterations in their morphological variation over time. The distinguishing characteristics of A.II. include the type of tang cross-section that is either rectangular or square, as well as the length of the arrowhead. They typically have a greater length than A.I. arrowheads. Another aspect

concerns the blade's shape. Although both A.I. and A.II. exhibit a lanceolate blade shape, A.II. gradually assumed a longer and narrower form. They have been discovered in archaeological contexts ranging from the 1st to the 9th century CE.

A.II.1.
The specimens of this variant consist of 6 iron arrowheads, measuring between 3.5 and 5 cm in length and weighing between 3 and 13 gr. The maximum width of the blade is positioned in the lower part in comparison to the A.I. examples, both of which have a lanceolate-shaped blade. The variations in shape are not notably significant however, the variation in the type of tang cross-section is more important. Among type A arrowheads, the quantity of rectangular/square tang arrowheads exceeds that of circular/oval ones. They have been discovered in archaeological contexts dating from the 1st to the 4th century CE.

A.II.2.
This variant consists of 13 iron arrowheads with rectangular/square-head. Most specimens in this group have a rectangular/square tang, although a few exhibits a circular/oval tang. The length of the arrowheads ranges from 4 to 8 cm, with the tang being nearly equal in length to the blade. Their blade shape is lanceolate, gradually elongating and narrowing over time, with the maximum width of the blade shifting towards the lower part. They have been discovered in archaeological contexts ranging from the 1st to the 4th century CE. A few comparisons have been found at Taxila (Marshall 1951: 547-549, Pl. 165, No. 80) and Saidu Sharif (Callieri 1989: 216, Fig. 154, S2068 – S2125).

A.II.3.
This variant is represented by 17 iron arrowheads with rectangular/square-heads. Within this group, there are specimens that have a rectangular/square tang, as well as specimens with a tang that is circular/oval in cross-section. It is worth noting that the number of circular/oval tangs increases in this variant.
The specimens of A.II.3 have a range in length from 5.6 to 12.5 cm and a weight ranging from 4 to 16 gr. They become even narrower than the previous subtypes. The key criterion for categorizing these arrowheads into this sub-type is the decreasing width of the blade as the blade length increases. Here, the arrowheads have blades that are two or three times

longer than their tangs. These artefacts have been found in various contexts ranging from the 4th to the 15th century CE. A number of comparative examples can be found at Taxila (Marshall 1951: 547-549, Pl. 165, No. 81) and Damkot (Rahman 1968-69: 108-111, Fig. 16, No. 13).

B. Tri-bladed/Triangular-head tanged arrowheads

Here are presented 41 iron arrowheads. Most of them have been unearthed in contexts dating from the 1st to the 4th century CE. Moreover, this category comprises two specimens dating back to the late 2nd century BCE, one specimen dating from the 1st BCE to the 1st CE, and eight specimens dating from the 5th to the 10th century CE (Fig. 2).

B.I. Tri-bladed/Triangular-head with circular tang

This sub-type consists of a collection of 12 iron arrowheads. There are 4 tri-bladed arrowheads and 8 triangular-head arrowheads, all of which have circular tang. The specimens of this group are damaged and often lack either all or a portion of the tang. Their length ranges from 3 to 5.6 cm and they weigh between 3 to 12 gr. All of them have a lanceolate blade shape. These arrowheads have been categorized based on the length and shape of the blade, as they have suffered significant damage and lack of tang. The archaeological context of these findings spans from the late 2nd century BCE to the early 4th century CE. Possible comparative examples could be 2 arrowheads found at Charsadda (Coningham, Ali 2007: 151, Fig. 9.1, Sfs 476 – Sfs 929), but unfortunately, they are not from stratigraphic contexts.

B.II. Tri-bladed with circular tang

This sub-type includes 17 iron tri-bladed arrowheads that almost all of them have circular tang. These arrowheads are presented in two variants based on their measurements and the ratio of blade and tang.

B.II.1.
This sub-type is represented by 10 iron tri-bladed arrowheads. All arrowheads, except for one with a rectangular tang, have circular tangs. Their length ranges from 4.4 to 8.8 cm, while their weight falls between 9 and 19 grams. 4 of them feature a deltoid-shaped blade, while the rest have a lanceolate blade shape. Despite having a lanceolate form, the widest

section of the blade is positioned very close to the tang, creating a similarity to a deltoid shape. According to 3 specimens that still have intact tangs, the blade's length is twice that of the tang. Two of them have barbs. Considering that the elongation of the lower sections of blades, referred to as barb, is mainly linked to the deltoid blade's shape, it is possible to assume that other examples, or at least some of them, initially had barbs. The arrowheads of this specific sub-type reveal increased dimensions in terms of length, weight, and width when compared to prior versions of type B. Interestingly, these artefacts have been found during a specific time, spanning from the 1st to the early 4th century CE. For this sub-type, the comparisons could be found at sites such as Ai Khanoum (Bernard 1973: 159, Fig. 41, No. 028), Taxila (Marshall 1951: 547-549, Pl. 165, No. 88), Saidu Sharif (Callieri 1989: 216, Fig. 154, S2073) and Surkh Kotal (Fussman 1990: 158, Pl. 8, Nos. 540-541).

B.II.2.
This variant includes 13 iron tri-bladed arrowheads with circular tang. 7 of them have a deltoid shape blade, while the remaining ones have lanceolate blade shape. Their length ranges from 5 to 9 cm, while their weight varies between 3.94 and 18.7 gr. Their blades have a narrower width compared to B.II.1. This type presents a range of sizes, but a crucial criterion is that the length of the tang is nearly equal to the length of the blade. Most of these artefacts have been discovered in contexts ranging from the 3rd to the late 4th century CE. Two of them were revealed in later contexts, dating from the 5th to the 10th century CE. A few comparisons are mentioned among findings at Shaikhan Dheri (Dani 1965-1966: 119) and Damkot (Rahman 1968-1969: 108-111, Fig. 16, No. 18).

B.III. Triangular-head with oval/circular tang

This sub-type includes 6 iron arrowheads with triangular head and oval or circular tang. The specimens of this sub-type have been categorized into two variants according to their measurements.

B.III.1.
This group consists of 3 iron arrowheads characterized by the triangular-head, oval tang, and the lanceolate blade shape. Their length ranges from 3.92 to 4.36 cm, and their weight varies between 5 and 14.53 gr. They have been discovered in contexts ranging from the 5th to the 10th century CE.

B.III.2.
This variant consists of 3 iron arrowheads characterized by the triangular-head, circular tang, and lanceolate blade shape. Their length ranges from 5.2 to 6.6 cm, and their weight falls between 9.17 and 15 gr. On comparing them to examples of B.III.1, arrowheads of this varinat exhibit greater length, width, and weight. Additionally, they have a distinct form of tang. They have been discovered in archaeological contexts ranging from the 5th to the 15th century CE.

C. Bi-Bladed arrowheads

This type comprises 7 iron bi-bladed tanged arrowheads, classified into 2 sub-types based on their distinguishing features, particularly the presence or absence of a stem (Fig. 3).

C.I. Bi-bladed with tang and stem[3]

This sub-typr includes 4 iron bi-bladed tanged arrowheads with stem. Furthermore, one of the arrowheads has barb as well. There is a morphological variation among the stems. The length of arrowheads varies from 3.96 to 8 cm, while their weight ranges from 8.1 to 25.7. These artefacts have been found in archaeological contexts dating to the mid-late 2nd century BCE.

C.II. Bi-bladed with oval tang

This sub-type contains 3 iron bi-bladed tanged arrowheads. Their length ranges from 8.35 to 11.6, while their weight ranges from 8.21 to 16.84. Their blades are lanceolate, and the tangs have oval/circular cross-section. The chronology of their contexts spans from the 1st to the early 4th century CE. A possible comparison could be among the findings of Saidu Sharif (Callieri 1989: 216, Fig. 154, S1896).

In addition to the aforementioned examples, certain arrowheads have distinctive traits that set them apart from others.

[3] The stem is a narrow structural feature of the arrowhead that is placed between the blade and the base. It is part of the base.

D. Double-bladed arrowheads

The term "double-blade" is used to describe arrowheads that feature a blade exhibiting a profile of sigma (Σ) shape, resembling two levels of blades. They are described also as double-curved edges blade (Snodgrass 1964: 146).

3 iron arrowheads of this particular type were revealed in Barikot. These artefacts contain circular or oval tang cross-sections. Two of them have blades with tri-blade or triangular cross-sections, while one has a rectangular-head. The earliest example was found in a context ranging from the 1st to the 2nd century CE. Only the upper portion of the blade reached us. It measures 3.4 cm in length and weighs 7.2 gr. The second example, which features a rectangular-head, was discovered from a context dating back to the 2nd and 3rd century CE. It measures 5.1 cm in length and weighs 11.84 grams. The third example, which is exceptionally well-preserved, exhibits two distinct types of blade cross-section: a triangular upper blade and a tri-blade lower blade. Furthermore, it also includes barbs. This arrowhead measures 9.49 cm in length and weighs 16.83 gr. It has been discovered in a layer dating to a period between the middle and late 4th century CE. Some arrowheads found at Damkot (Rahman 1968-69: 108-111, Fig. 16, No. 15), Taxila (Marshall 1951: 547-549, Pl. 165, Nos. 79-82-85) and Saidu Sharif (Callieri 1989: 216, Fig. 154, S2011-S2012-S2018) could be compared to this type (Fig. 3).

E. Arrowheads with stem

This type contains a total of 7 iron arrowheads. Their shared characteristic is the presence of a stem. There are four arrowheads with a square cross-section, two with a rectangular cross-section, and one with a triangular cross-section blade.

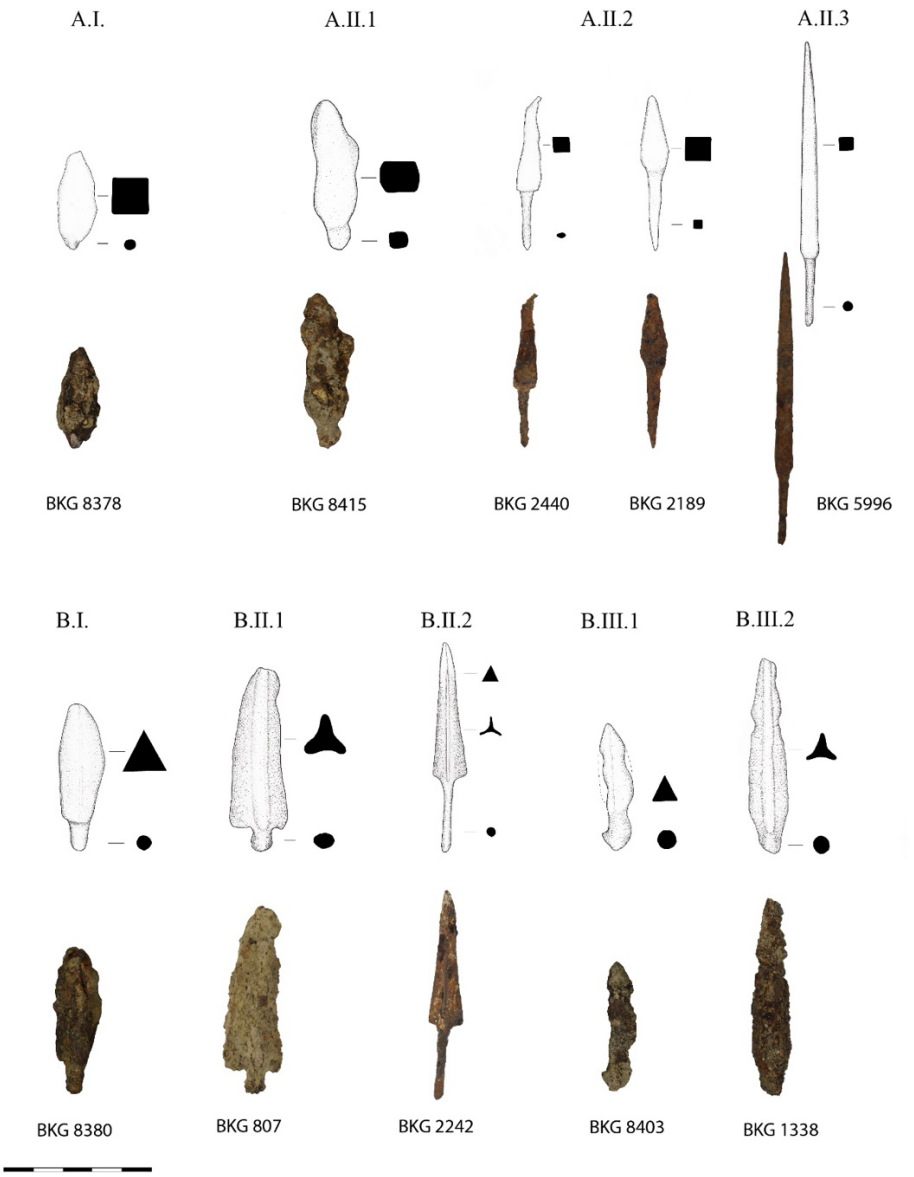

Fig. 2 - Typology of arrowheads: Type A and type B
(Photos and drawings by the Author).

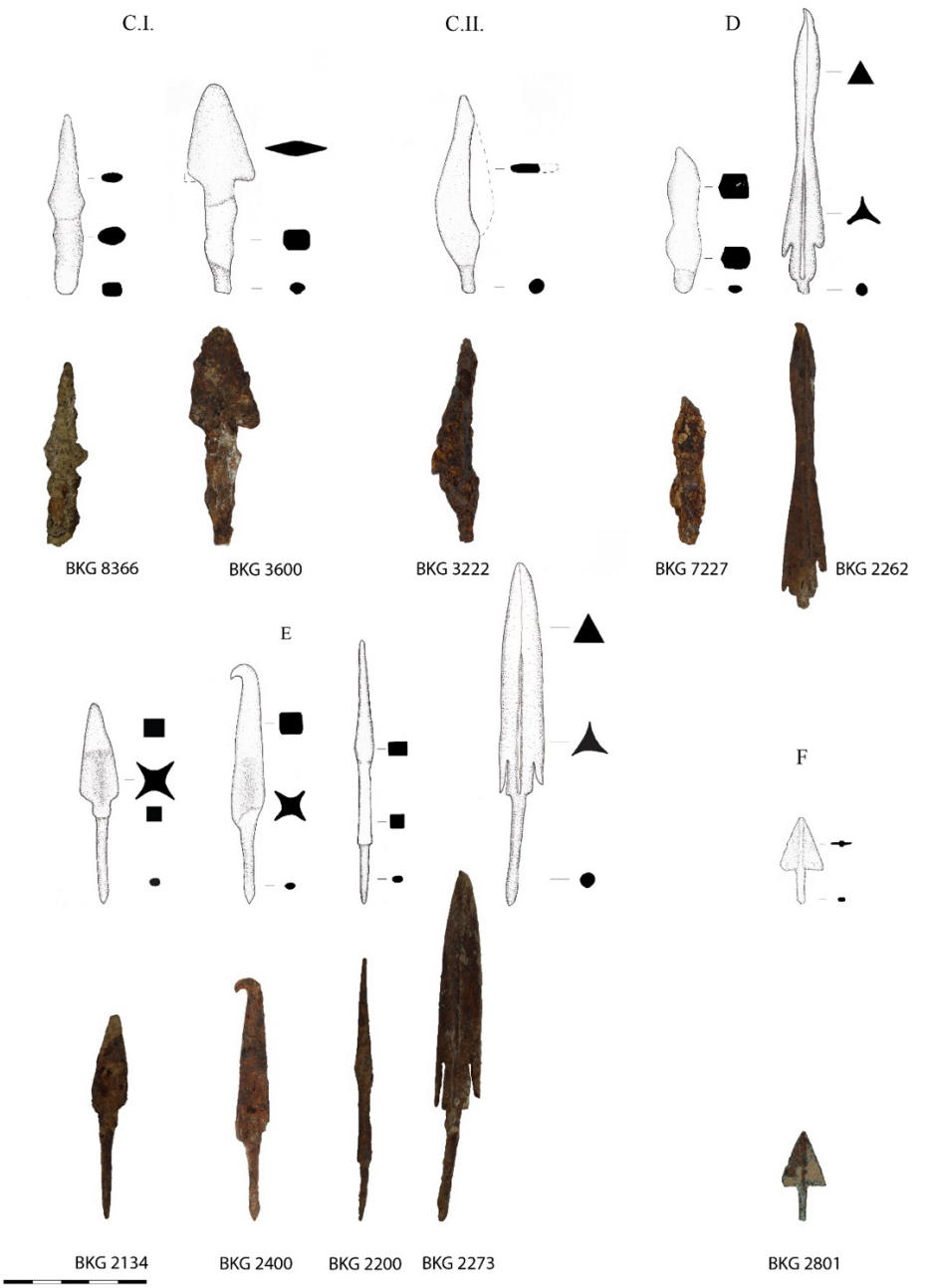

Fig. 3 - Typology of arrowheads: Type C, D, E and F
(Photos and drawings by the Author).

One arrowhead also has a barb. The arrowheads feature a circular/oval cross-section tang. Their length ranges from 5.6 to 12 cm, while their weight ranges from 8.55 to 35 gr. The length of the blade exceeds that of the tang, and most of them have a deltoid blade shape. These artefacts have been discovered in archaeological contexts ranging from the 2nd to the 9th century CE. However, it is important to highlight that five of them were revealed from contexts dating back to the mid-late 4th century CE. A few comparable arrowheads have been found at Taxila (Marshall 1951: 547-549, Pl. 165, Nos. 72-73-74-77-78-84-89) (Fig. 3).

F. Copper alloy arrowhead

Only 1 copper alloy arrowhead has been discovered in Barikot. This arrowhead is a bi-bladed that has been equipped with a rectangular cross-section tang. It has a deltoid blade shape and features a midrib, which serves to enhance the strength of the blades. The arrowhead is characterized by its diminutive size and lightweight nature, measuring 3.1 cm in length, and weighing 1.56 grams. Given its dimensions, it is probable that it could be used for the purpose of hunting diminutive fauna. It has been found in context attributed to the late Kushan period and dated to the 3rd century CE (Fig. 3).

4. Conclusions

The earliest evidence of metal arrowheads in Barikot has been found in the Indo-Greek phase, dated to the late 2nd century BCE. It includes three sub-types of arrowheads: with rectangular-head and tang (A.I.), tri-blade and triangular-head arrowheads with circular tang (B.I.) and bi-bladed tanged arrowheads with stem (C.I.). We lack supporting evidence that the production of bi-blade tanged arrowheads with stem continued in subsequent periods. Merely 3 examples of bi-bladed tanged arrowheads, without stem, surfaced from contexts dated between the 1st and the 4th century CE.

In contrast, rectangular-head arrowheads (referred to as type A and divided into 2 sub-types and 3 variants) and tri-bladed/triangular-head arrowheads (referred to as type B and divided into 3 sub-types and 4 variants) have undergone manifold modifications over the centuries. These types emerged as the predominant arrowhead forms and maintained their

prominence until the 15th century CE. Collected data clearly demonstrates that these arrowheads account for 90% of the corpus studied.

The current findings from the excavations at Barikot reveal a significantly larger assemblage of arrowheads discovered in contexts dating from the 1st to the 4th century CE. During this period, there is a noticeable alteration in the structure of arrowheads. The arrowheads' length increased progressively. Initially, the blade and base had equal lengths, as shown in variants A.II.2 and B.II.2. Subsequently, the blade's length surpassed that of the base, as in variant A.II.3.

Changes in size are accompanied by the narrowing of the blades (A.II.2, A.II.3, and B.II.2), and the lanceolate shape of the blade gradually changes to the deltoid shape. An increase in width and weight appears exclusively in variant B.III.2. It is curious that as various types of arrowheads decrease in width, only one group increases in width and weight. Further investigation is required to explore the potential causes for this alteration. However, it is crucial to recognize that comprehending this matter involves acknowledging the distinct performance characteristics of various blade types and aligning them with user requirements. For instance, experimental archaeology and anthropological studies reveal that tri-bladed arrowheads cause more severe damage (Karger et al. 1998). Hence, crafting a broader tri-blade arrowhead could have both strategic and practical factors to consider.

The rectangular arrowhead has a distinct advantage in terms of accelerated production when compared to its tri-bladed counterparts. The manufacturing process is quicker and simplified due to its uncomplicated design. This implies that a greater number of arrows can be manufactured within a shorter period of time, offering a practical benefit for individuals requiring arrows urgently (Cole 2023: 51-61).

Regarding types D and E, their limited quantity doesn't necessarily reflect their overall production. Instead, what stands out is the inventive approach taken in their crafting. Adding various structural features, including barb, stem, double-blade, and even a combination of these elements, underscores the innovation and skill applied during their production. These enhancements not only show the artisan's skill but also serve to increase the lethality of the weapon.

Arrowheads with similar characteristics of both types have been discovered at Taxila. S.J. Marshall labelled all of them as “double-tanged arrowheads” (Marshall 1951: 547-579). The term “double-tang” does not correspond precisely and correctly to the functional definition of the

structures of an arrowhead. In the case of some of these arrowheads (i.e. type E), there exists a stem that is situated between the blade and the base. The main function of the stem is to strengthen the arrowhead, thereby preventing the blade from breaking or detaching from the base when it hits a target. It is crucial to highlight that the stem is not designed for cutting (its width is significantly less than the blade). Instead, its purpose is to provide support for the arrowhead to achieve the best possible penetration into the target. Furthermore, in some arrowheads (i.e. type D), there exist two levels of blade. The second blade (the lower one) has a width that is equal to or greater than the upper blade. This differentiation indicates its application as a secondary blade, causing more severe injuries.

In this case, the term double-tang not only ignores the accurate description of the structural features of the arrowhead but also oversimplifies the differentiation between two structural features that serve different purposes. By accurately acknowledging the structural features of the arrowhead and by proposing a typology grounded in a systematic description, two key points are argued here:

First, the double-blade arrowhead represents an innovation in arrowhead production, with its earliest archaeological evidence in Barikot dating back to the 1st century CE. In contrast, the earliest archaeological evidence of stem in Barikot dates back to the 2nd century BCE (sub-type C.I.). Following a gap period of approximately two centuries, there is again evidence of arrowheads with stem dating back to the 2nd century CE. Besides the chronological distribution, another consideration is regarding the quantity of arrowheads with stem and double-blade. There is a higher prevalence of arrowheads with stems in both Barikot and Taxila, while only a few examples of double-blades have been found.

The development of this chrono-typology, employing a systematic descriptive approach, has enabled the identification of morphological traits in the structure of arrowheads over time, leading to the determination of distinct arrowhead types. By studying a collection of artefacts from stratigraphic archaeological contexts with precise and updated dating, the typology has been enriched with valuable chronological data. The findings of this study shed light on the evolving production process of arrowheads at Barikot. Noteworthy aspects, such as periods of innovation, heightened production needs, and the prolonged dominance of certain forms, have emerged within this evolutionary process. These findings not only contribute to our understanding of arrowhead production at Barikot but also propose new subjects for further research in this field.

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