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Archery Equipment in the Neo-Assyrian Period,

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Abstract

Archery played a major role in the Assyrian military, which achieved dominance over much of the Near East in the Neo-Assyrian Period (10^{th}-7^{th} Centuries BC). Archers and archery equipment pervade Assyrian iconographic and textual sources, and arrowheads are among the most abundantly attested metal artifacts found in excavations. Nevertheless, the archery equipment of the Neo-Assyrian Period has yet to be subjected to systematic study.

The purpose of this work is to examine Neo-Assyrian archery equipment in its social and ideological context, the manner in which it was employed (or portrayed as being employed) for both hunting and warfare, and the forms and manufacture of the objects themselves, with particular emphasis on the creation of an encompassing typology for arrowheads.

Ideologically relevant sources, principally palace reliefs and royal inscriptions, show that the bow was a potent symbol for military power, both in a positive sense (symbolizing the power of Assyria and derivation of that power from a divine mandate) and a negative sense (broken bows symbolizing the broken power of enemies or violators of treaties).

Administrative texts provide a great deal of insight on archers in the organization of the Assyrian military, though because preserved archives only deal with certain aspects of the military at certain times (such as charioteers in the time of Sargon II), it is difficult to construct a comprehensive overview. Textual sources are largely silent about tactics, and attempts to reconstruct Assyrian tactics from iconographic representations are of dubious value because of the inherently interpretative nature of iconographic sources.

Thus the study of the form and manufacture of archery equipment (and arrowheads in particular) forms the centerpiece of this study. Because no bows or arrow shafts survive from the Neo-Assyrian Period, they can only be studied via iconographic and textual evidence, as well as comparable examples from other regions. Arrowheads, however, are one of the most commonly found metal artifacts at sites dating to the early 1^{st} Millennium BC. Despite their prevalence, previous studies of arrowheads have focused either on individual sites or on the purported links between certain arrowhead types and historically attested ethnic groups. There is, therefore, a clear need for a complete super-regional typology for metal arrowheads.

The first step in creating the typology was to gather a large sample of arrowheads from Assyria and the surrounding regions where the Assyrians were frequently active (Babylonia, Iran, Urartu, Syria and the Levant). To ensure that the sample was representative and not unduly influenced by the

idiosyncrasies of any individual site, a minimum if two sites per region were chosen for inclusion, with a preference for sites with either large quantities of published arrowheads (or available for study at museums), unique arrowheads, or sites which have featured significantly in previous discussions of arrowheads. For each of the twenty sites chosen, the entire corpus of published arrowheads was entered into a database (a total of 1325 examples from all sites combined).

A typology of arrowhead morphology was then created based on this data. In order to make the classification of arrowheads as precise as possible, the primary method of categorization is the presence or absence of clearly-defined physical features (such as the number of blades), rather than on relative qualities (such as length). The manufacture and metallurgy of arrowheads has also been investigated, with particular emphasis on how those factors that influence arrowhead form.

Among the direct results of the typological study is the identification of which arrowhead forms have a limited chronological distribution and thus may be used as "dating fossils." Regional distribution patterns have also shed light upon the purported relationships between ethnic groups and arrowhead forms. A direct attribution of arrowhead form to ethnicity is not possible because of the rapidity with which arrowhead forms spread between different ethnic groups, though certain styles of artifacts were given ethnic attributions in Neo-Assyrian and Neo-Babylonian texts.

The resulting typology is thus an essential part of a systematic description of Neo-Assyrian archery, and will provide archaeologists and researchers a standardized method of classifying and comparing future arrowhead finds over a wide geographical area.

Zusammenfassung

Bogenschießen spielte eine wichtige Rolle in der assyrischen Armee, die die Herrschaft über einen Großteil des Nahen Ostens in der neuassyrischen Zeit (10. bis 7. Jahrhundert v. Chr.) erreichte. Die Ausrüstung der Bogenschützen und allgemein im Bogenschießen sind allgegenwärtig in Assyrischen Bild- und Textquellen. Pfeilspitzen gehören zu den am reichlichsten bezeugten Metallartefakten. Dennoch muss die Bogenschießenausrüstung der neuassyrischen Zeit einer systematischen Untersuchung unterzogen werden.

Das Ziel dieser Studie ist es, neuassyrischen Bogenschießenausrüstung in ihrem sozialen und ideologischen Kontext zu untersuchen, die Art und Weise, in der sie benutzt (oder als benutzt dargestellt) wurde, sowohl für die Jagd als auch für den Krieg, und die Formen und die Herstellung der Objekte selbst, mit besonderem Schwerpunkt auf der Erstellung einer regionalen Pfeilspitzentypologie.

Ideologisch relevante Quellen, hauptsächlich Palastreliefs und Königsinschriften, zeigen, dass der Bogen ein starkes Symbol für militärische Macht war, sowohl im positiven Sinne (als Symbol für die Macht von Assur und dessen Machtableitung eines göttlichen Auftrages) als auch einem negativen Sinn (gebrochener Bogen als Symbol für die gebrochene Macht der Feinde oder Vertragsverletzungen).

Verwaltungstexte bieten ein hohes Maß an Einsicht auf Bogenschützen in der Organisation des Assyrischen Militärs. Dennoch ist es schwierig einen umfassenden Überblick zu rekonstruieren, da sich konservierte Archive nur mit bestimmten Aspekten der militärischen Organisation zu bestimmten Zeiten (z.B. Wagenlenker in der Zeit von Sargon II) befassen,. Textquellen verschweigen größtenteils Taktiken und Versuche, assyrische Taktik aus ikonographischen Darstellungen zu rekonstruieren haben einen zweifelhaften Wert, da ikonographische Quellen von Natur aus auf Interpretationen beruhen.

So ist die Untersuchung der Form und der Herstellung von Ausrüstungen zum Bogenschießen (insbesondere Pfeilspitzen) das Herzstück dieser Studie. Da keine Bögen und Pfeilschäfte aus dieser Zeit überlebten, können sie nur durch Bild- und Textquellen sowie vergleichbare Beispiele aus anderen Regionen oder Zeiträumen untersucht werden. Pfeilspitzen sind jedoch einer der am häufigsten vorkommende Metallartefakte aus der Zeit. Trotz ihrer Verbreitung haben frühere Studien von Pfeilspitzen entweder einzelne Standorte als Fokus gehabt, oder sich auf den angeblichen Verbindungen zwischen bestimmten Arten von Pfeilspitzen und historisch bezeugte ethnische

Gruppen konzentriert. Es gibt daher einen unverkennbaren Bedarf für eine vollständige regionale Typologie von Metallpfeilspitzen.

Der erste Schritt bei der Erstellung der Typologie war es, eine große Stichprobe von Pfeilspitzen aus Assyrien und der umliegenden Region, wo die Assyrer häufig aktiv waren (Babylon, Iran, Urartu, Syrien und der Levante), zu sammeln. Um sicherzustellen, dass die Stichprobe repräsentativ und nicht übermäßig von den Eigenheiten von irgendwelchen Standorten beeinflusst ist, wurden mindestens zwei Standorte pro Region für die Aufnahme ausgewählt - mit einer Vorliebe für Standorte mit entweder großen Mengen von veröffentlichten Pfeilspitzen (oder in Museen für Studiumszwecken erhältlich), einzigartigen Pfeilspitzen, oder Standorte, die schon in früheren Diskussionen über Pfeilspitzen wichtig waren. Für jede der zwanzig ausgewählten Standorte wurde der gesamte Korpus von veröffentlichten Pfeilspitzen in eine Datenbank (insgesamt 1325 Beispiele aus allen Standorten kombiniert) eingetragen.

Eine Typologie von Pfeilspitzmorphologie wurde dann auf Grund dieser Daten erstellt. Um die Klassifizierung der Pfeilspitzen so präzise wie möglich zu ermöglichen, ist die primäre Methode der Kategorisierung das Vorhandensein oder Fehlen von klar definierten physikalischen Eigenschaften (wie die Flügelanzahl Flügel), anstatt dessen relativen Qualitäten (wie Länge). Die Herstellung und Metallurgie von Pfeilspitzen wurde ebenfalls untersucht, mit besonderem Schwerpunkt auf wie diese Faktoren der Pfeilspitzformen beeinflussen.

Unter den direkten Ergebnissen dieser typologischen Studie sind die Identifikation der Pfeilspitzenformen, die eine zeitlich begrenzte Verteilung haben und damit als „Datierungsfossilien“ verwendet werden können. Regionale Verteilungsmuster haben auch Aufschluss über die angenommenen Beziehungen zwischen ethnischen Gruppen und bestimmte Pfeilspitzen Formen ergeben. Eine direkte Zuordnung der Pfeilspitzenformen und Ethnizität ist, wegen der Geschwindigkeit, mit der Pfeilspitzformen zwischen verschiedenen ethnischen Gruppen sich ausgebreitet haben, obwohl bestimmte Artefaktenarten einer ethnischen Zuordnung in den neuassyrischen und neubabylonischen Texten unterzogen wurden, nicht möglich.

Die daraus resultierende Typologie ist damit ein wesentlicher Teil einer systematischen Beschreibung des neuassyrischen Bogenschießens. Sie wird Archäologen und Forschern ermöglichen, die in der Zukunft gefundenen Pfeilspitzen standardisierter einzuordnen und über einen weiten geographischen Bereich zu vergleichen.

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1. Introduction

Archery played a central role in warfare during the Neo-Assyrian Period, however, no comprehensive study of Neo-Assyrian archery equipment has yet been made. The intent of this work is to examine the archery equipment – particularly arrowheads – used in the Assyrian Empire in the early 1st Millennium BC.

Textual and iconographic sources reveal a great deal about the role archery equipment played in Assyrian ideologies. The bow is employed frequently as a symbol of military might in official Assyrian texts (such as royal inscriptions) and iconographic sources (such as palace reliefs). The king receiving a bow from a deity symbolized the divine mandate of his rule, the defeats his enemies by means of his bow, and the bows of enemies are broken or taken away. A number of conventional poses or scenes (such as the "turned bow" and the "heroic overdraw") were employed to stress the dominance of the king, as well as to imbue him (and occassionally other Assyrians) with heroic abilities in both war and hunting.

Archery employed in hunting and in warfare is also abundantly attested in Assyrian sources. Descriptions and depictions of hunting in official sources focus almost exclusively on the king, presenting him as a skilled and daring hunter, yet on occassion non-royal Assyrians also particiapate in hunting. Hunting was also an important theme for common Assyrians, as the prevalence of hunting scenes on private seals attests. Archery in warfare abounds in iconographic sources. Nearly every battle scene involves archers, who included every level of society from non-Assyrian auxiliaries to the king himself. Administrative texts provide a great deal of information about archers in the organization of the Assyrian military and the various roles they played.

As they were constructed of perishable materials, no bows or arrow shafts from the early 1st Millennium BC have survived in the Near East. In order to study these objects, textual and iconographic sources must be employed. Textual sources concerning archery equipment are lamentably minimal, thus iconographic materials represent the most significant source for their study. Some bows and arrow shafts do survive in other contexts, most notably the well-preserved examples found in the tomb of Tutankhamon, so these can be used for comparison and to infer details that are unclear from depictions. While quivers also do not survive from the Neo-Assyrian Period, a number of decorated bronze quiver covers do.

The primary focus of this work, however, is metal arrowheads. Unlike other archery equipment, arrowheads survive in abundance in the archaeological record. Their proliferation raises the

possibility that they could be used as 'dating fossils,' thus providing a valuable tool for archaeologists. However, in order for arrowheads to be used for this purpose, a comprehensive typology is necessary.

The artifacts studied, however, cannot be limited solely to Assyrian sites. The location where arms (particularly comparatively disposable arms such as arrowheads) are deposited is not very informative as to their origin. The Assyrian army ranged across virtually all of the Near East, thus artifacts deposited by them may be found throughout the region, while many of the arrowheads deposited at sites in Assyria itself may have come from the attackers that destroyed the Assyrian Empire at the end of the 7th Century BC. Furthermore, there was an extensive "internationalization of arms" in the early 1st Millennium BC, where successful military technologies spread rapidly through the Near East.[1] Assyrian arms appear to have been frequently copied by groups who came into contact with them, the success of Assyrian arms and tactics providing "a standard to be equaled" by their opponents.[2] The socketed bronze arrowheads normally identified with the Cimmerians and Scythians were also rapidly adopted by other groups throughout the Near East (see §7). Thus, arrowheads not only from Assyria but its surrounding areas must be studied to present a complete picture of the kinds of arrowheads in use at the time, and it is not always possible to distinguish precisely what kinds were used by the Assyrians what which were not.

The metallurgy and manufacturing techniques of arrowheads will also be examined in some detail, as these factors often have a direct bearing on the forms of the arrowheads that were employed. This is partularly relevant when addressing the issue of why iron tended to replace bronze as the metal of choice for arrowheads around the beginning of the 1st Millennium BC, and why bronze came to again be widely used with the introduction of socketed bronze arrowheads in the 7th Century BC.

The thorny issue of arrowheads as markers of ethnicity must also be addressed since many previous studies make assumptions about the movements of historically-attested peoples based on the distribution of types of arrowheads. This is most notably the case with the association of socketed bronze arrowheads with invading Scythians and Cimmerians. Recent research has raised serious doubts about using the form of objects to make assumptions about the ethnicity of the people who deposited them. Arrowheads are particularly difficult to assign to ethnic groups, since successful military technologies are often very rapidly adopted by those who come into contact with them (by trade, warfare, etc.).

A number of typologies for arrowheads have already been created. Most concern arrowheads only from specific sites, and some only deal with either iron arrowheads or bronze, but not both.

[1] Barron 2010, p. 2
[2] O'Connell 1989, p. 44

Comprehensive regional typologies have been created for other areas and periods (such as that of Jessop for Medieval Europe), but as yet, there has been no such typology for Near Eastern arrowheads of the early 1st Millennium BC.

In order to create a comprehensive typology, the features that the typology encodes must first be defined. Clear definitions are often lacking in previous typologies, and this often leads to rather subjective distinctions between arrowheads. Because the intent of this typology is to create a tool that can be employed by any archaeologist or researcher, it has been constructed to reduce the subjective element as much as possible by focusing on clearly-defined and distinct physical features rather than relative features. Thus, for example, relative width is not a valid typological distinction, however the presence or absence of a stop on the tang is. By constructing type designations based on concrete physical features, there should be little question about which type any given arrowhead belongs to, and multiple researchers should be able to apply the type designations in a consistent manner, which is essential for comparison.

Because arrowheads are rarely dated with any great precision, I have expanded the time period covered by this work to a round 1000-600 BC rather than limiting it strictly to the Neo-Assyrian Period. This also allows a clearer view of how arrowheads developed into the forms used in the Neo-Assyrian Period, and how they continued to change just after that period ended.

In order to ensure a representative sample, a database of 1325 arrowheads (or objects purported to be arrowheads) was gathered from a variety of sites distributed across the areas of the Near East where the Assyrians were principally active. Sites were chosen based on a number of criteria so as to ensure that each region is represented by at least two sites, and sites which yielded either large quantities of arrowheads or unusual forms of arrowheads were included.

The typology produced by this work will, it is hoped, prove to be a useful tool, enabling arrowheads to be easily assigned to a type, which will in turn provide comparative dating information and similar examples from other sites.

2. Sources, Chronological and Geographical Limits, and Goals

2.1. Sources

The nature of the sources available for the study of Neo-Assyrian archery equipment necessarily influences the goals to some degree (as there is little point in having a goal that is unattainable with available sources). Therefore, a survey of the relevant source material is a necessary preliminary to establishing the goals of this study.

2.1.1. Iconographic sources

One of the great appeals of the Neo-Assyrian Period is the vast amount and diversity of artistic sources available for study. These include stelae, scenes depicted in glazed bricks, the throne base of Shalmaneser III, wall paintings, etc. Those few of these sources that contain archery-related ioconography will be dealt with when appropriate, however, the primary focus will be on the largest groups of archery-related iconographic material: palace reliefs, bronze bands from gates, ivories, and seals.

2.1.1.1. Palace reliefs

Perhaps the largest and most heavily studied corpus of Assyrian iconography is made up of the extensive reliefs that decorated a number of Assyrian palaces. In chronological order of the date they were built, the palaces with large amounts of preserved reliefs are the Northwest Palace of Assurnasirpal II at Nimrud,[1] the Central Palace of Tiglath-Pileser III at Nimrud,[2] the palace Sargon II at Khorsabad,[3] the Southwest Palace of Sennacherib at Nineveh,[4] and the North Palace of Assurbanipal also at Nineveh.[5] The apparently unfinished Southwest Palace of Esarhaddon at Nimrud contained few reliefs, a number of which were re-used orthostats from the Northwest and Central palaces, still bearing the reliefs of Assurnasirpal II and Tiglath-Pileser III (though often with the sculpted sides turned inwards, against the walls).[6] Other official carved stone monuments may be considered alongside reliefs, such as the Rassam Obelisk[7] and White Obelisk of Assurnasirpal II[8], as well as the Black Obelisk[9] and throne base of Shalmaneser III. [10]

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[1] Budge 1914
[2] Barnett & Falkner 1962
[3] Albenda 1986
[4] Barnett, Bleibtreu & Turner 1998. A number of the reliefs at the Southwest Palace date to Assurbanipal and perhaps also Esarhaddon and Sîn-šar-iškun (rooms XIX, XXVIII, and XXXIII); Reade 1979a, pp. 109-110. See also Bleibtreu's arguments against the Court XIX reliefs belonging to Sîn-šar-iškun but rather to Assurbanipal; Barnett, Bleibtreu & Turner 1998, p. 84, note 1.
[5] Barnett 1976
[6] Barnett & Falkner, p. 20-21
[7] see Reade 1980a

Reliefs and other related sculptures have some advantages as iconographic sources: they can generally be dated to the reign of a specific king and it is also certain that they were produced in Assyria, were intended for public view (or view by certain elements of the public), and thus certainly portray what the king and his state desired to be seen as official iconography.[11] Furthermore, their vast extent of most of these reliefs offers a very large sample for any comparative studies.

2.1.1.2. Balawat Gates

Several doors from public buildings at Balawat, located 16 km northeast of Nimrud,[12] were covered with horizontal bronze bands, embossed and engraved with scenes reminiscent of those on the palace reliefs.[13] The best known of the Balawat Gates is that of Shalmaneser III, which originally graced his palace in Balawat, published by King in 1914 and again by Schachner in 2007. Two further gates had also been excavated, but being less well preserved, they had been largely neglected until they were finally published in 2008 in a volume edited by Curtis & Tallis. Both of these gates date from Assurnasirpal II; one came from that king's palace at Balawat, the other from a temple to Mamu. As with palace reliefs, the various Balawat gates can all be dated with reative precision, and all were almost certainly made in Assyria[14] and certainly were intended to display official iconography.

2.1.1.3. Ivories

Another large corpus of iconography from the Neo-Assyrian Period is ivories (though relatively few examples are archery-related). While attested at many sites, a particularly vast quantity was found in the ruins of Nimrud.[15] Ivories present far more complications than reliefs as sources for iconographic information. First, even when used as inlay on pieces of furniture, ivories were far more portable items than relief orthostats, and it is very likely that many of the ivories found in the ruins of Assyrian palaces were not manufactured in Assyria or by Assyrians; indeed, stylistic analysis suggests that only a small percentage of the Nimrud ivories are Assyrian (or, at least, in the Assyrian style).[16] Thus, the

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[8] The dating of the White Obelisk is disputed, with some arguing that it dates to Assurnasirpal I (e.g. Reade 1975 and Pittman 1996) and some to Assurnasirpal II (e.g. Sollberger 1974). The arguments for Assurnasirpal II seem rather more convincing, so I have included the White Obelisk with other examples of his iconography, though the possibility that it significantly pre-dates him should be borne in mind.
[9] Layard 1853a, pls. 53-56
[10] Oates 1963, pp. 10-22
[11] The intended audience of Assyrian palace reliefs is a matter of considerable debate (see §3.1).
[12] Curtis & Tallis 2008, p. 7
[13] The fragmentary remains of similar bronze bands have also been found at Khorsabad (see Guralnick 2008 for overview) as well as Nimrud, Assur, and Tell Hadad (Curtis 1982, p. 118).
[14] There is a possibility that the craftsmen who made the bands and other Assyrian bronzes were foreigners, however even if this was the case, the bronzes they produced may be regarded as essentially Assyrian, as Curtis observed (Curtis 1988, p. 84). Their content makes it clear that they were commissioned by Assyrian kings, and they were produced using Assyrian iconography comparable to that used in palace reliefs.
[15] Published principally in 7 volumes by the British School of Archaeology in Iraq
[16] Mallowan & Davies 1970, p. 1

iconography they contain likely has little to do with the official iconography of the Assyrian state. Indeed, the nature of their iconography, whatever their origin, is uncertain. The objects that had been adorned by ivories may have been used in a public or official manner,[17] displaying official iconography, yet others may have been used in a private context, and thus their iconography would not necessarily be related to official or public iconography. In addition, ivories are rather more difficult to date than palace reliefs. While the destruction layers of the palaces most were found in can be dated with considerable accuracy (to within a year in some cases) it is very likely that some of them were already fairly old at the time they were deposited, and some may have been in storage.[18] Thus, the interpretation of the iconography of ivories suffers from both geographical and chronological uncertainty.

2.1.1.4. Seals

Seals constitute perhaps the second largest corpus of iconographic material relating to archery after reliefs. Most seals cannot be dated with any great accuracy; in many publications, the date is given with no greater precision than "Neo-Assyrian." Furthermore, as small, highly transportable objects, their place or country of origin is sometimes very ambiguous. Glyptic iconography is a rich resource, however interpretation of its iconological content is complicated by the use of seals in both public and private realms, and thus directing their iconography at various audiences. Some seals were official, intended for use in service of the state, the king or a temple,[19] and as such, they display official iconography of the state (or other institutions). Other seals, however, were used for the private dealings of individuals,[20] and thus display what might be termed "private iconography," the symbols and themes that the general population found meaningful to them as individuals.

2.1.2. Textual sources

Texts relevant to Neo-Assyrian archery equipment can be divided into two basic categories. The first category consist of texts intended for "public" consumption (for a discussion of the nature of the audiences of public texts, see §3.1), and which generally contain explicit or implicit ideological messages. Foremost among these are royal inscriptions, large quantities of which have survived from the Neo-Assyrian Period.[21] Other public documents include treaties and loyalty oaths[22] as well as

[17] The fragments of ivories from the throne from of the Northwest Palace at Nimrud may have come from the throne of Assurnasirpal II, for example; Herrmann 2009, p. 11.
[18] Herrmann 2009, p. 17; a more extreme example is an Egyptian ivory that was some 600 years old when deposited at Ekron; see Herrmann 2009, p. 12.
[19] See Winter 2009a
[20] Note that officials might possess official seals for their official duties as well as private seals for their own private dealings.
[21] Luckenbill 1927, Grayson 1991 (RIMAP 2), Grayson 1996 (RIMAP 3), RINAP I (Tadmor & Yamada 2011), RINAP III (Grayson & Novotny 2012), and RINAP IV (Leichty 2011)
[22] SAA II (Parpola & Watanabe 1988)

literary texts.[23] These texts show how archery equipment was portrayed in ideologically-significant contexts (such as a bow as an attribute of a deity; see §3.3).

The second category of documents consists of administrative texts, which were intended for mundane, practical purposes and were comparatively free of ideological messages. Vast quantities of Neo-Assyrian administrative texts have survived, many of which have been published by the State Archives of Assyria Project[24] and the Cuneiform Texts from Nimrud series.[25] Administrative texts include letters to the king, legal texts, inventories, ration lists, etc., all of which provide a necessary counterpoint to the ideologically-laden royal inscriptions as they show the inner workings of the administration of the Assyrian Empire.

2.1.3. Artifacts

Most archery-related equipment from the Neo-Assyrian Period was made of perishable materials. No Neo-Assyrian arrow shafts or bows survive, so these objects can only be approached through textual references, iconographic representations, and comparable artifacts from other periods or regions. The few relevant textual sources are generally administrative texts (primarily inventories). Iconographic representations of bows, arrows and quivers are very frequent, however, appearing in palace reliefs, bronze door bands, wall paintings, ivories, seals, etc. Nevertheless, the accuracy with which these depictions represent actual equipment that was in use at the time, and the manner in which it was used, is a matter of debate (see §3.2). Comparable artifacts from other regions and periods (most notably the bows and arrows preserved in the 14th Century BC tomb of the pharaoh Tutankhamon[26]) may provide a great deal of information on the equipment used in those places and at those times, though there is necessarily a certain degree of uncertainty as to how closely they relate to the equipment of the Assyrians in the Neo-Assyrian Period.

Both arrowheads and quiver covers do survive in the archaeological record, however, so these artifacts may be examined directly. Quivers were themselves made of perishable materials, such as leather, however some quivers were covered with thin sheets of bronze (see §5.2). These are often elaborately decorated and their form reveals the overall shape of the quiver to which they were attached. This allows them to be compared to iconographic representations of quivers.

As one of the more commonly-found kinds of metal artifacts, iron and copper alloy arrowheads survive in comparatively large numbers and are attested at a wide variety of sites (generally

[23] SAA III (Livingstone 1989)
[24] e.g. SAA I (Parpola 1987), SAA V (Lanfranchi & Parpola 1990), SAA VI (Kwasman & Parpola 1991), SAA VII (Fales & Postgate 1992a), SAA XI (Fales & Postgate 1992b), SAA XV (Fuchs & Parpola 2001), SAA XVII (Dietrich 2003), and SAA XVIII (Reynolds 2003)
[25] e.g. Dalley & Postgate 1984 (CTN III)
[26] see McLeod 1982

documented in excavation reports). This frequency of attestation offers the possibility of creating a regional typology (see §2.3.6).

2.1.4. Methodology for the study of source material

The variety of available source materials allows the examination of a number of different aspects of archery in the Neo-Assyrian Period. Official texts and iconography represent by far the largest proportion of relevant surviving material. As these are interpretative sources, they provide insight on how the Assyrian ruling class viewed archery within the context of their own ideology and worldview. Non-interpretative official sources (such as administrative texts), which tend to be relatively free of ideology, show how archers and archery actually functioned within the Assyrian military. Non-official or private sources are far less common, but a considerable number of private seals bear archery iconograph, which indicates the ideological or symbolic role of archery for Assyrians outside of the ruling class.

The bow played a significant role in the symbolism of the power of the Assyrian state and the legitimacy of the king. To investigate these themes, the iconography of public monuments (such as palace reliefs, stelae, and bronze gate bands) must be examined. These sources are augmented by official texts (principally royal inscriptions), which provide invaluable written attestations to many of the same themes (e.g. the king receiving his mandate in the form of a bow from a deity; see §3.5), thus helping to clarify their meaning. As these monuments can normally be dated to within the reign of a single king, they also allow changes in the usage of these themes over the course of most of the period.

The bow was also an important symbol in non-official or private iconography. Numerous Neo-Assyrian seals contain depictions of archers, typically hunting and religious rituals, which suggests the manner in which archery was related to by the population as a whole. Unfortunately, textual sources to clarify their precise meaning are lacking and the lack of precise dating for the vast majority of seals precludes a diachronic analysis of the evolution of these themes within the Neo-Assyrian Period.

Archery played a central role in the Assyrian military. Some information on the function of archers may be gleaned from public iconography (and to a lesser degree, from royal inscriptions). Because of the interpretative nature of these depictions, however, conclusions drawn from them are tentative at best unless they can be supported by other kinds of sources (see §3.2). Public iconography and texts normally present highly interpretative and subjective views of the matters they deal with, while administrative texts are largely non-ideological, and therefore provide a considerably more objective

view of their subject material. Such texts are also often able to be dated with some precision, allowing them to be studied diachronically. Their principal drawback is that they normally focus on a specific aspect of the military organization, making it difficult to reconstruct a complete overview of the organization of the military, and they also frequently make use of organizational terms (such as rank or position designations for personnel), the meaning of which are obscure (e.g. such as the chariot officers referred to as *bēl mugerri* and *mār damqi*; see §4.2.2).

To examine the form and manufacture of archery equipment, different sources must be employed for different kinds of equipment. No bows or arrow shafts survive from the Neo-Assyrian Period, therefore they must be studied via the few relevant administrative texts, depictions of bows on all forms of iconography, and by surviving examples from other periods (such as those found in the tomb of Tutankhamon). No Neo-Assyrian quivers have been preserved, however a number of bronze quiver covers have, which enable a comparison with iconographic depictions.

Arrowheads, on the other hand, survive in large numbers. Depictions of arrowheads in iconography are not useful comparanda, as they rarely possess anything but the most rudimentary detail (see §5.3), though textual sources so sometimes make reference to the materials arrowheads were made of or give them ethnic attributions that may relate to their form (see §7.1). Therefore, the principal source for the study of Neo-Assyrian arrowheads is the preserved arrowheads themselves. The large number of surviving examples has allowed a regional typology to be created (see §2.3.6 for methodology).

2.2. Chronological and Geographical Focus

2.2.1. Chronological focus

The principal focus of this work is Assyria during the Neo-Assyrian Period. However, the precise definition of the Neo-Assyrian Period is inherently somewhat arbitrary. The start date is sometimes assigned to the accession of Aššur-dān II in 934 BC,[27] and sometimes to his successor, Adad-nirari II, in 911 BC.[28] The end of the Neo-Assyrian Period is more precisely defined, limited to the very end of the 7th Century BC, however the precise date is also a matter of some debate. It could be dated to the defeat of the major cities of the Assyrian heartland, 614-612 BC,[29] or the fall of the last Assyrian capital at Harran in 609 BC,[30] or with the defeat of the last organized remnant of the Assyrian army as

[27] e.g. Kuhrt 1995, p. 473 and Hausleitner 2010, p. 12
[28] e.g. Fales 2001, p. 4 and Roaf 1990, p. 159
[29] Oates 1961, p. 9
[30] Fales 2001, p. 12

it fought alongside the Egyptians at the Battle of Carchemish in 605 BC.[31] Kuhrt avoided chosing a specific event by assigning the end of the period to an arbitrary ca. 610 BC.[32]

Due to the ambiguities of dating the period, and even more so because of the difficulty in assigning precise dates to artifacts, I have rounded the period covered by this work to an even 1000-600 BC.

2.2.2. Geographical focus

A precise definition of Assyria as a region is also problematic. The land the Assyrians called *māt Aššur* changed and expanded through the Neo-Assyrian Period, encompassing, for example, greater or lesser portions of the Ḫabur region.[33] For the purposes of this study, the area along the upper reaches of the Tigris around Assur and Nineveh (which was part of Assyria through the entire period until the fall of the empire in 614-612 BC) will be considered Assyria proper.

However, this study cannot be limited to the Assyrian heartland alone. The Assyrian military was active throughout the Near East, and consequently their military equipment has been deposited over a wide area. Furthermore, over the course of the early 1st Millennium BC, the Assyrian Empire absorbed, or at least ruled over, portions of the surrounding regions, encompassing the majority of the Near East at its greatest extent.[34]

This, combined with the "internationalization of arms" that took place in the early 1st Millennium BC Near East (wherein successful types of arms were adopted by most national or ethic groups across the Near East),[35] means that a focus solely on Assyria itself will be relatively meaningless. Therefore, this study will cover not only the heartland of Assyria, but also the surrounding regions where the Assyrians were principally active. I have thus divided the area covered by this work into the following basic geographical regions (note that these regions do not always correspond exactly to the borders of the countries they are named after):

- **Northern Iraq** (the Upper Tigris, corresponding to the ancient Assyrian heartland)
- **Southern Iraq** (the the Lower Tigris and Euphrates, corresponding to ancient Babylonia)
- **Iran** (the Zagros Mountains and Iranian plateau south of Lake Urmia)
- **Transcausasia** (the area around Lake Van, corresponding to ancient Urartu)
- **Syria** (the Ḫabur region and Upper Euphrates, including southeastern Turkey)
- **The Levant** (the southeastern coast of the Mediterranean and River Jordan area)

[31] Fales 2001, p. 12
[32] Kurht 1995, p. 473
[33] see Postgate 1995
[34] Kuhrt 1995, pp. 493 & 499-500
[35] Barron 2010, p. 2

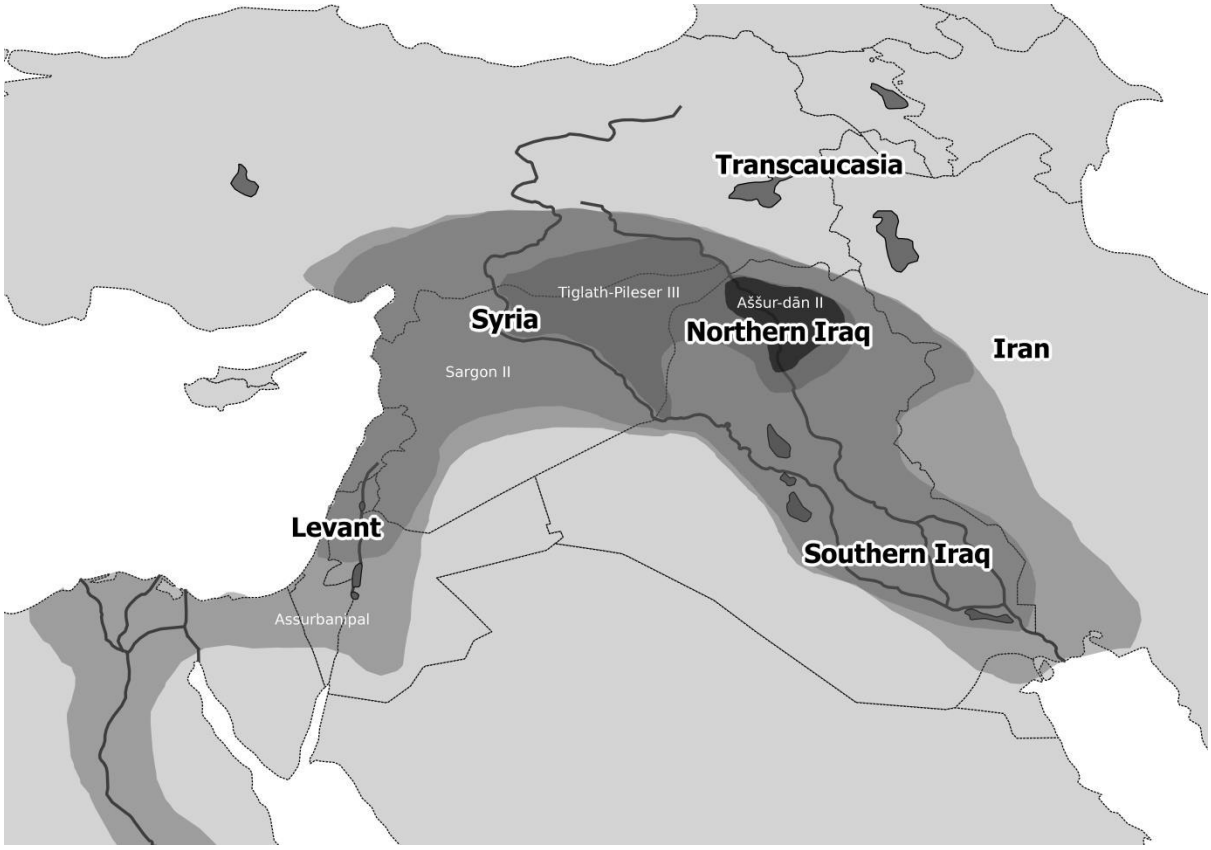

Figure 2.1: The general regions covered by this study, with approximate extents of the Assyrian Empire under the reigns of Aššur-dān II (934-912 BC), Tiglath-Pileser III (744-727 BC), Sargon II (721-705 BC), and Assurbanipal (668-c.630 BC) (borders based on Roaf 1990, pp. 164, 179 & 191; basemap and other shape files courtesy of Natural Earth).

2.3. Goals

A comprehensive study of archery equipment in the Neo-Assyrian Period requires not only an examination of the objects themselves, but also the role archery and archery equipment played in Assyrian ideology, art and military activities in the early 1st Millennium BC. Because multiple facets of archery and archery equipment must be examined, multiple methods must be employed.

2.3.1. Archery in Assyrian ideology and iconography

Archery and archery equipment played a significant role in Assyrian ideology and iconography, both the official state ideology and what might be termed the "private ideology" of common Assyrians. Official imperial or royal ideology is widely attested in multiple types of sources, including palace reliefs, stelae, and royal inscriptions (see §3). The ideology expressed by or used by private Assyrians is much less well attested than the official state ideology, nevertheless, it is attested in some sources, principally seal iconography.

2.3.2. Archery in practice (warfare and hunting)

In addition to its ideological function, it is also necessary to investigate how archery (and its related equipment) was actually practiced in the Neo-Assyrian Empire, both for hunting and for warfare. The primary sources for royal hunting are royal inscriptions which describe (and most likely exaggerate) the king's prowess in the hunt, and iconographic sources such as palace reliefs, stelae, etc., contain depictions of the king (and sometimes his retinue) hunting wild animals. Non-royal hunting is comparatively poorly attested, primarily only in the iconography of private seals (though whether the individuals depicted hunting on these are the seal-owners or mythological figures is often debatable).

Archery in Assyrian warfare is abundantly attested. Virtually all warfare-related reliefs, wall-paintings, bronze door bands, stelae, etc., contain depictions of archers in action. From these depictions, some notion of the form of the equipment in use may be derived, though the depictions cannot be assumed to be completely accurate representations of the equipment in use at the time (see §3.2.1). Furthermore, iconographic depictions of archers in action have been used to reconstruct Assyrian tactics, though this must be approached with even greater caution (see §3.2.2).

Royal inscriptions sometimes touch upon archery, however the principle textual sources for Assyrian military archery are the large quantities of military-related administrative texts that have been preserved. These texts generally do not deal with archery as engaged in combat, but rather how archers were organized in the Assyrian military and, to a lesser degree, how their equipment was distributed.

2.3.3. Overview of types of archery equipment

Most types of archery equipment were made from perishable materials and examples do not survive from the Neo-Assyrian Period. Thus, in order to study bows, arrow shafts, and the perishable parts of quivers, one must examine the few relevant sources. Relatively few textual sources describe archery equipment in any significant way. These are primarily inventories, which sometimes list the materials the objects are made of.[36] Iconographic sources are abundant, however, as archers are frequently depicted in all forms of Neo-Assyrian art (reliefs, stelae, seals, ivories, etc.). These depictions can indicate forms of equipment used (which sometimes suggests their composition, as in the case of composite bows[37]), yet, as stated above, they cannot be assumed to be direct and accurate reflections of reality. Geniune artifacts have been preserved from other regions and periods (most notably, the

[36] e.g. SAA VII 89
[37] Zutterman 2003, pp. 126-128

large quantity of archery equipment found in Tutankhamon's tomb[38]), yet how closely they relate to Neo-Assyrian equipment may be debated.

2.3.4. Manufacture and distribution of archery equipment

As the materials and manufacturing methods used to create archery equipment may influence its form and function, this area must also be examined. Some forms of archery equipment (bows, arrow shafts, etc.) were made of perishable materials and do not survive, however. Thus, the materials and manufacture of these items can only be approached via the sparse textual references and comparable surviving artifacts from other regions and time periods (most significantly, the bows and arrows found in Tutankhamon's tomb), and to a lesser degree, by analysis of iconographic depictions of these items (though in this case, the interpretation of the representations is never completely straightforward).

Two forms of archery equipment do survive in the archaeological record, however. Bronze quiver covers are attested at a number of sites and can be compared to iconographic representations of the same. More significant, however, are the iron and copper-alloy arrowheads which survive in considerable quantities. While the typological study here (see §9) examines their forms, it is also necessary to examine their metallurgy and the means by which they were manufactured, as the manufacturing methods and materials may impact the forms used for arrowheads (see §6.2 and 6.3).

The distribution of archery equipment is not well-attested, with only a small number of administrative texts touching upon the subject. Texts that illustrate how the empire handled the manufacture and distribution of other materials may also allow some inferences about archery equipment.

2.3.5. Ethnicity

A number of studies have attempted to link arrowhead styles with ethnic groups, most notable being the attribution of socketed bilobate and trilobate arrowheads to Scythians and/or Cimmerians. If such identifications were possible, it would, of course, be extremely valuable in enabling researchers to track the movements and activities of ancient peoples by the characteristic physical remains they leave behind. The identification of types of artifacts or artistic styles with historically-attested ethnic groups is highly problematic, however. Ivantchik has nevertheless attempted to create a systematic method for linking types of artifacts (including arrowheads) with the Cimmerians,[39] which is particularly relevant to this work as it directly concerns socketed bronze arrowhead types that were used in the ancient Near East in the Neo-Assyrian Period (see §7).

[38] McLeod 1982
[39] see Ivantchik 1997

2.3.6. Methodology for a typological study of arrowheads

While the relative prevalence of arrowheads in archaeological sites from the early 1st Millennium BC make them one of the more commonly found metal artifacts, a comprehensive typology for early 1st Millennium arrowheads has not yet been made. Previous typologies have generally been made either for individual sites where large quantities of arrowheads have been found or for specific types or groupings of arrowheads (see §9.4).

Armies in the ancient Near East often covered great distances, engaging in combat in lands far from their point of origin. For example, when on campaign, the Assyrian army carried out military operations throughout the Near East, from Egypt to Iran. Arrowheads are, therefore, regional artifacts and as such, ought to be examined in a regional context.

Furthermore, for a typology to be an effective tool, it should include all forms of arrowheads. Focusing on a specific group or type of arrowheads, as some studies do, makes one's conclusions somewhat artificial. If one looks only at the distribution of socketed bronze arrowheads, for example, one will not see how they relate to the distribution of iron arrowheads. Thus all forms of arrowheads in use during the period of study should be examined together.

Type designations must be assigned in a rational and objective manner in order to ensure reproducibility and consistency among the users of the typology. The Assyrians doubtless distinguished between different kinds of arrowheads, however the manner in which they did so is not recorded in any surviving sources. Neo-Assyrian texts do refer to several different varieties of arrows (see §9.1), however precisely what distinguished the arrows designated by each of these terms cannot be determined as the sources do not describe them. Furthermore, the terms may have referred to some distinguishing characteristic of an arrow besides the form of the arrowhead (such as the length of the arrow shaft). Therefore, it is not possible to create a typology of arrowheads based on the categorizations that the Assyrians themselves would have themselves employed.

Thus, the typology presented in this work is based as much as possible on distinct features rather than relative features (though the Assyrians may well have made use of relative features when distinguishing arrowheads themselves; see §9.3). For example, whether an arrowhead has a lenticular, rhomboid, or ribbed section is an objective feature, not subject to interpretation (except sometimes in cases of heavy corrosion), however differentiating between arrowheads with short, medium or long blades requires one to make a purely subjective and, indeed, arbitrary distinction between those categories. Thus, the more a typology relies on objective features, the more consistent it will remain, regardless of how many researchers make use of it. It is also necessary to establish a

standardized terminology of arrowhead features to prevent any ambiguity or confusion (see §6.1). These features should be encoded in type designations which allow for all possible combinations, given that arrowhead with currently-unattested combinations of features may be discovered in the future.

Arrowheads are also a very pervasive type of find: nearly every substantial excavation in the Near East has unearthed at least a few, attesting to the proliferation of archery throughout ancient Near Eastern life. Given that they are very common finds, a comprehensive regional typology would be useful to allow more precise comparisons between different sites. Unfortunately, due to the sketchy dating of the majority of arrowhead finds, arrowheads are of limited use as chronological tools (though in some cases, they can make a significant contribution to understanding the chronology of a site, such as at Gerar).

Nevertheless, an examination of that rough chronological data, together with the distribution of the different types of arrowheads in a comprehensive typology across various sites could tell us about how arrowhead forms developed over time, and thus allow them to be more effectively used as a chronological tool.

2.3.6.1. Arrowhead sources

The principle source for arrowheads is the numerous examples found in archaeological excavations. While the dating of these arrowheads is sometimes imprecise (and sometimes quite uncertain), they do provide a direct look at arrowhead types that were used in the period (as opposed to iconographic representations, subject to interpretation, error, etc.). In addition, a small number of texts refer to arrows or arrowheads. Because these cannot be linked to any specific type of arrowhead, they will be discussed separately. Finally, iconographic depictions of arrowheads (particularly from palace reliefs) are generally uninformative. Though such depictions are numerous, they rarely possess any significant detail (partularly as reproduced in photographs or drawings), and are therefore of little typological use (see §9.2).

2.3.6.2. Sites

Arrowheads are among the most commonly found types of artifacts in the Near East, therefore it is natural to consider their use as a diagnostic tool. The armies of the ancient Near East crossed large distances – the Assyrians campaigned as far afield as Elam, Egypt and even Cyprus. Therefore, the distribution of arrowheads may be more closely linked to patterns of international relations and warfare than to patterns of settlement. However, successful military technologies, in the ancient world as today, tend to be adopted by most of those who come in contact with them, so the same kind

of equipment may be used by both sides in the same conflict. The intended focus of this work is on the Assyrians, but because of the extreme difficulty, even impossibility, of assigning ethnic origins to arrowhead forms, I have instead included all the regions where the Assyrians were frequently active, so as to include the sorts of arrowheads that they would have been familiar with, whether or not they used them (see §8.1 for the sites chosen).

A survey of finds from across the ancient Near East will help to indicate which forms were limited to more specific areas. The introduction and evolution of arrowhead types may also be followed, with the hopeful end result that at least the less common forms might become useful tools in dating the context in which they were found. Perhaps more importantly, such a survey will also show when certain kinds of arrowheads were in use, enabling arrowheads to be used as means of dating sites, much as ceramics are.

The publication of arrowhead finds unfortunately is often very irregular, and the data recorded for each individual arrowhead varies from publication to publication. In addition, the publications for sites where large quantities of arrowheads are found rarely illustrate all of them, but rather offer a selection or make a typology to summarize them. Because absolute numbers of arrowheads found are not always available for individual sites, large-scale statistical analyses of the different forms of arrowheads used must be approached with caution. Such analyses may be very revealing when it comes to relative sizes of arrowheads and the possible existence of categories of arrowheads based on size, but it is not always possible to accurately tell in what areas certain types of arrowheads were frequently or infrequently used. Nevertheless, the data does still conclusively show what forms of arrowheads were used in which areas.

2.3.6.3. Uses of typology

A typology created based on these principles would be a useful tool for archaeologists and researchers for several reasons. A regional typology of this nature will allow systematic classification, which will consequently make it simple to find comparanda from across a wide area. This ability to compare arrowheads in a systematic manner may help to refine the dating of specific arrowhead types (as some sites have more precise dating than other sites), and, in presenting more precise dating for arrowhead types, may increase their utility as dating fossils. Because the surveyed area is large, regional trends in arrowhead design may be evaluated. These trends may help to evaluate the validity of theories concerning the association of artifact types to ethnic groups, and tracing the movements of those ethnic groups by distribution of their characteristic artifact types.

However, this typology does possess drawbacks. The number of sites is, while representative, somewhat limited, therefore the addition of more sites will help to flesh out the data and make it a more useful comparative tool. More significant, however, is the relatively short time span it covers – roughly four centuries. Because of the vagueness of the dating of many of the finds, its use as a chronological tool is somewhat limited. Thus, the current typology shall serve as a proof of concept, and when determined to be a functional tool, it can be expanded to include other sites and other time periods (ideally, as many sites as possible covering the entire period that metal arrowheads were in use, so any arrowhead found can easily be assigned a type and an approximate date based on its shape and material alone).

3. Archery in Assyrian Ideology and Iconography

A considerable number of studies of Neo-Assyrian iconography – particularly palace reliefs – deal with the issue of ideologies (in particular, the ideology of the Assyrian ruling class) and how they were embodied in and disseminated by iconography.[1] However, they rarely if ever define just what they mean by "ideology." Part of the reason for this may well be the vague manner in which the term is often used. Indeed, in his comprehensive study of ideology and its use in social science metholdologies, Larraín noted that ideology is "perhaps one of the most equivocal and elusive concepts one can find in the social sciences,"[2] since its definition varies so widely among theoretical approaches and everyday usage, and because of its political connotations. In particular, the theoretical definitions of "ideology" have a tendency to be somewhat self-serving, emphasizing the aspects that the theoretical process in question is designed to examine.[3]

Studies of Assyrian ideology generally appear to make use of a Marxist interpretation of ideology as "the portrayal of the particular interests and values of certain social groups as if they were those of everyone in a society."[4] The Assyrian Empire contained a great deal of inequality, both between Assyrians and non-Assyrian, and among the Assyrians themselves. Thus, for the society to function, those who were in an economically or socially subordinate role had to be made to accept and support the *status quo*. The ideology promoted and disseminated by the Assyrian ruling class (as embodied by the king) served the purpose to both justify and encourage a "systematization of unbalance."[5] Reliefs, inscriptions, and other expressions of the "dominant ideology"[6] promote the world view of the king (and less directly, other members of the ruling class), enforcing the conception of a social order wherein Assyria rules over other nations, and the king was chosen by the gods to rule over Assyria and all its subjects. This may serve as a working defnintion of the "official ideology" of the Assyrian Empire as portrayed on its public monuments.

As Pollock observed, it is would be very unusal for a single dominant ideology to control "all the ideological production of a society."[7] Other ideologies or world views certainly existed within the Assyrian Empire and within Assyrian society; they are what might be termed "private ideologies," or ideologies of the general populace. As these people did not control large amounts of resources, craftsmen, and scribes to promote their ideologies, however, they are much more poorly attested than

[1] e.g. Liverani 1979, Reade 1979b, and Porter 2003
[2] Larraín 1979, p. 13
[3] For example, Marxist interpretations of ideology tend to heavily focus on economic issues; Miller & Tilley 1984, p. 5
[4] Pollock 1999, p. 173
[5] Liverani 1979, p. 297
[6] Abercrombie *et al* 1980, p. 24
[7] Pollock 1999, p. 174

the official ideologies. In relation to archery and archery equipment, the most valuable source for private ideology is the iconography from private seals, which carry symbols and themes (such as religious or mythological scenes, hunting or contest scenes, etc.[8]) that doubtless represented some aspect of the world view of the individuals who owned them.

In any event, iconography is useful not only for what it can say about ideology, but may also provide some useful information about the actual forms of equipment used and the manner in which they were employed. Nevertheless, it must be remembered that any iconographic depiction cannot be assumed to be an accurate representation of reality (see §3.2).

3.1. Audience

An important factor to take into account in interpreting displays of iconography is their intended audience(s). This is particularly the case when analyzing their iconological or ideological content,[9] however it may also impact the merely iconographic content itself. The choice of which kinds of archery equipment to portray and how to portray it may have depended, to some extent, on the message it was intended to convey, and to whom. Tactical matters – how archery equipment was employed – may have been even more influenced by these factors.

Private iconography, such as that found in personal seals, may tell us something about the symbols and ideas that common Assyrians valued. However, official iconography, presenting the ideology of the king and the Assyrian state, has been studied far more extensively, there being a much larger sample, more complicated contexts, as well as numerous official texts to aid in deducing their meaning. Furthermore, the the vast majority of archery-related iconography is derived from official sources, particularly palace reliefs and bronze gate bands, thus official iconography must be the principle focus here.

As a major feature of large, official monuments, palace reliefs and gate bands provided a highly visible display of official Assyrian ideology. The multiple audiences for this iconography included foreigners, common Assyrians, courtiers, gods and the king himself.[10]

The primary audience for these reliefs is often assumed to have been visiting foreigners, [11] the depictions of Assyrian victory intended to intimidate them.[12] Certainly, the Assyrians made use of

[8] Frankfort 1939, pp. 194-216
[9] Panofsky 1955, pp. 30-32
[10] A convenient table listing all the audiences for Assyrian palace reliefs (and other official sculpture), as well as the basic ideological messages intended for them is provided by Fales 2009a, p. 281, Chart 1.
[11] e.g. Barron 2010, p. 4 & Frankfort 1996, p. 148

fear and intimidation to demoralize enemies and control the defeated,[13] which Fales classified as "crudely propagandistic"[14] and which Liverani called the "ideology of terror."[15] Presumably foreign visitors to an Assyrian royal palace would not be members of a group actively fighting against the Assyrians (unless brought there as prisoners), but rather allies, defeated enemies or neutral third parties. Therefore the iconography employed in Assyrian palaces would have served both to glorify the Assyrian Empire and thus stress its right to rule over others, as well as warn subjects and allies of the Assyrians of the perils of rebellion.[16] Nevertheless, Assyrian iconography was not meant to merely intimidate foreigners – this negative reinforcement of Assyrian ideology was balanced with positive reinforcement, portraying the king as just and even, at times, merciful.[17]

Assyrian iconography was sometimes directed towards other audiences, however. Reliefs and inscriptions in temples were likely seen by very few people (principally the king and members of the priesthood), and it is likely that their intended audience were the gods to whom the temples were dedicated.[18] As Assyrian ideology regarded the king's mandate as being derived from the gods (see §3.5), it is perhaps not surprising that iconography would be directed at the gods to emphasize the king's success in carrying out that mandate.

The king and future kings were certainly also part of the audience for palace reliefs. For the king who commissioned the reliefs, they would doubtless provide a certain degree of self-gratification. Reade observes, for example, that hunting scenes tend to be found in the more private areas of the palace, and suggests that their content and placement was primarily intended to give the king pleasure in his own achievements.[19] Yet future kings were doubtless also intended to see the reliefs, and thus the reliefs would serve as a memorial for the king who commissioned them.[20] Though the quote in question refers to a foundation deposit rather than a relief, this notion is nicely summarized in an inscription of Esarhaddon: "I made foundation inscriptions, wrote the deeds that I had done on them, and left (them) forever for future kings, my descendants."[21] In their inscriptions upon monuments, kings would often call upon future kings to repair the monuments and restore the inscription should it become necessary.[22] What is more, other inscriptions indicate that kings did precisely this, restoring

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[12] Fales 2009a, p. 282
[13] e.g. Saggs 1963, pp. 148-150 & 153-154; Porter 2003, pp. 81-82
[14] Fales 2009a, p. 283
[15] Liverani 1979, p. 300
[16] Porter 2003, pp. 82-83
[17] Porter 2003, pp. 92-97
[18] Porter 2003, pp. 83-85
[19] Reade 1979b, p. 338-339
[20] Fales 2009a, p. 281, chart 1
[21] RINAP IV, Esarhaddon 57, vii 35
[22] e.g. RINAP III, Sennacherib 3, 62; RINAP IV, Esarhaddon 128, 18; Grayson 1996, p. 128 (A.0.102.46, 11b-16a)

the monuments of past kings.[23] Thus the ideology of Assyrian kings themselves in regards to Assyrian royalty emphasized preserving their own memory as well as the memory of previous kings. This did not prevent them from wishing to outdo their predecessors, of course, and numerous Assyrian inscriptions brag of the king performing feats never achieved by previous kings.[24]

The Assyrian populace itself may also have been a significant audience for Assyrian iconography;[25] Liverani went so far as to suggest that it was the primary audience.[26] His rather Marxist interpretation for the reasons for this – the need to keep the Assyrian working class supporting the Assyrian ruling class rather than turning on them despite not sharing directly in the tangible benefits of conquest, as well as to encourage them to support the Assyrian military[27] - certainly has some merit. Assyria did suffer a number of rebellions in the early 1st Millennium BC, though whether any of those could be classified as risings of the proletariat against the ruling classes is highly questionable, particularly since civil wars in Assyria itself generally revolved around conflicts for the throne.[28] In any event, the palace reliefs would have helped to foster a sense of group identity by portraying triumphs that, though led by the king, were taken part in by many Assyrians.[29] This group identity would, presumably, help to cement the allegiance of common Assyrians to the king. The "royal validation" expressed in reliefs,[30] i.e. the portrayal of the king as pious, given his mandate by the gods, brave and victorious in battle would be been an important message for both Assyrians and foreigners alike.

Reade, however, has argued that palace reliefs were probably not terribly relevant to the common Assyrian population (who would not have easy access to them[31]), but rather that they were first and foremost "court art,"[32] with their ideological messages directed principally toward the members of the royal court. This may seem like "preaching to the choir," since the members of the royal court belonged to the Assyrian ruling class, and thus would naturally have a vested interest in maintain the dominance of the Assyrian power structure. Yet if the Assyrian court was the principle audience of palace reliefs, it may partly explain the strong emphasis on the person of the king. The Assyrian ruling class may have been inherently devoted to maintaining their power structure, however they did not always agree on who should lead it, Assyria having suffered from several civil wars due to rival claimants for the throne, as stated above. Thus, the message of the reliefs to the members of the royal

[23] e.g. Grayson 1996, p. 62 (A.0.102.13, 1'-10')
[24] Such as Tiglath-Pileser III bragging that he "appointed governors in places where the chariots of the kings, my ancestors, never crossed over;" RINAP I, Tiglath-Pileser III 35, ii 18'.
[25] Winter 2009b, p. 32
[26] Liverani 1979, p. 299
[27] Liverani 1979, p. 299
[28] For example, Tiglath-Pileser III came to the throne during a civil war (see Zawadzki 1994), and Shalmaneser V appears to have been deposed by a coup or rebellion to be replaced by Sargon II (see Grayson 1992, p. 87).
[29] Winter 2009b, p. 43
[30] Porter 2003, p. 90
[31] Fales 2009a, p. 280
[32] Reade 1980b, p. 74; see also Fales 2009a, p. 283.

court could be interpreted roughly as, "we Assyrians have the right to rule others, but I, the king, have the right to rule *you*." The iconography of palace reliefs would also have served to help foster the group identity of the Assyrian ruling class by portraying triumphs and successes in which they shared. Indeed, some members of the Assyrian ruling class were depicted and even named on palace reliefs.[33]

Thus the iconography of Assyrian palace reliefs presents its ideological messages at several levels and for multiple audiences. As Winter observed, in their inscriptions, Assyrian rulers emphasized the splendor and wondrousness of their palaces, built "to the astonishment of all peoples."[34]

3.2. Mimesis

For the purposes of the present study, the most important issue concerning palace reliefs and other iconography is that of "mimesis," or how closely matters depicted in the iconographic sources reflect the realities that they were meant to depict. Any artistic depiction is inherently an interpretation, as the artist must chose when to include, what to exclude, and how to depict what is to be included. The style of depiction must necessarily depend in part on the nature of the medium, but may also partake of existing artistic conventions.

Some insight on this may be derived from studies of Trajan's Column, one of the few other surviving examples of official narrative-style art in the ancient world, and one which raises many of the same issues regarding how accurately reality was depicted upon it.[35] Studies of Trajan's Column suggest that the military equipment depicted upon it does not always correspond closely to the actual equipment used by the Roman army in the field.[36] For example, the segmented body armor called *lorica segmentata* by modern researchers is very prevalent on Trajan's Column, while other evidence suggests that its use in the field may have been less common (though not unknown, as various archaeological finds indicate[37]). Furthermore, many of the details of its construction were depicted inaccurately on the column. This suggests that the artists picked this kind of armor as characteristically "Roman," and thus used "as shorthand to represent citizen troops (both legionaries and praetorians),"[38] whether the soldiers depicted would have actually worn it or not. Thus the "uniforms" on Assyrian palace reliefs which are taken to signifiy specific ethnic groups[39] should likewise be seen as a representational convention to clarify the action in the depiction to the viewer

[33] A letter of Sargon II, for example, discusses naming governors who led military campaigns on the reliefs depicting those campaigns; Dezső 2012a, p. 196.
[34] Winter 1993, pp. 37-38
[35] see Barron 2010, pp. 12-19
[36] Bishop & Coulson 1993, p. 22
[37] Bishop 2002, pp. 13-15
[38] Bishop 2002, p. 9
[39] e.g. Postgate 2000, pp. 100-101 & Postgate 2001

rather than a literal portrayal of the clothing and gear that the people depicted would have actually used. The objects depicted may be accurate representations of objects (though this is certainly not always the case), but the manner in which they are used, and by whom, is determined on the basis of the ideological message and iconographic clarity rather than on a concern for strict realism.

In addition, comparison with actual artifacts shows that the artists were not always that familiar with the equipment they were depicting,[40] so that even though the depictions may be highly detailed, much of that detail may well be from the imagination of the artists rather than from genuine observation of real artifacts – as Bishop succinctly puts is, "attention to detail should not be mistaken for accuracy.[41] Fales aptly terms this illusion of accuracy engendered by detailed depictions "figurative realism."[42]

There is an attractive hypothesis that the scenes depicted on the column are derived from "field sketches" made by individuals who witnessed the events they drew.[43] One may suppose that this would help to increase the accuracy of the depictions, however it must also be noted that it adds an extra layer of interpretation to the depictions: the artist who made the original sketches would have to choose what to sketch and what not to, and just how to depict what was to be included in the sketch. Then the sculptors would perform their own selection, choosing which sketches to use and which not to, and determining how to transform two-dimensional drawings to sculpted stone, as well as making adjustments to make the depictions fit the style they wished to utilize.

This theory has also been applied to Assyrian reliefs, particularly given that that some scenes or themes appear to be duplicated in almost identical form in multiple locations, as if they were copied from the same source (such as the death of the Elamite officer Ituni in both the Southwest and North Palaces at Nineveh).[44] Madhloom speculated that when two scribes are depicted together on reliefs - one writing on a clay tablet and the other on papyrus, apparently recording booty taken (see Figure 3.1) - the scribe with papyrus is actually a draughtsman, drawing scenes from the campaign to be copied by the sculptors of the reliefs.[45] Ussishkin has suggested that just such field sketches were the basis of Sennacherb's Lachish reliefs, going so far as to attempt to determine the location where the draughtsman was standing.[46] Whether this was the case or not, it serves to remind the observer that the sculptors making the reliefs likely were not first-hand witnesses to to the events they depicted, or even to the equipment they depicted, and whatever sources they made use of would have had their own inherent biases and selection criteria.

[40] Bishop & Coulson 1993, p. 22
[41] Bishop 2002, p. 9
[42] Fales 2009a, p. 245
[43] Barron 2010, p. 14
[44] Reade 1979d, pp. 25-26
[45] Madhloom 1970, p. 122; Reade agrees with this assessment, see Reade 1979d, p. 25.
[46] Ussishkin 1982, pp. 119-126

Figure 3.1: Two scribes, one with a clay tablet, the other with a papyrus, apparently recording booty, from the reliefs of Tiglath-Pileser III; after Layard 1853a, pl. 58.

3.2.1. Depiction of Objects

While reliefs are not a valuable source to study arrowheads (they are rarely depicted with any detail), they are a valuable source for other archery equipment, such as quivers and bows. Yet how accurately depictions of these objects represented the real objects is not always clear. Barron examined this issue by comparing archaeologically-attested weapons and armor (excluding archery equipment) from Neo-Assyrian sites with depictions of weapons and armor from the same period.[47] Her study was somewhat complicated by the fact that the majority of securely dated relevant artifacts come from the very end of the Neo-Assyrian Period, while the reliefs span the entire period. Thus the only reliefs that could in any way be considered contemporary to the artifacts are those of Assurbanipal, which were themselves well over a decade old by the time the artifacts were deposited.[48]

Barron found that depictions of arms and armor often do not correspond very well to the archaeological record. For example, Urartian helmets depicted on the Balawat Gates of Shalmaneser III have a rounded crown, ear flaps and an arc-shaped crest (see Figure 3.2). However, virtually all helmets attested from Urartian archaeological sites are pointed conical helmets, nearly identical to Assyrian conical helmets in form (see Figure 3.3).[49] Crested helmets may have indeed been used by the Urartians, as one unambiguously Urartian crested helmet is attested,[50] however the proportions of finds suggests that if depictions of Urartians were to be accurate, the majority should be shown wearing conical helmets. Yet it would likely have been confusing for the viewer if both opposing parties in a depiction of a battle were wearing identical gear. This suggests that the artists were not so

[47] Barron 2010
[48] e.g. her acknowledgement that swords found at Nimrud likely date to the final decades of the period, after the majority of the relevant depictions had been made; Barron 2010, p. 68
[49] Barron 2010, p. 192
[50] Identified as Urartian by an inscription of Išpuini (ca. 830-810 BC); see Dezső & Curtis 1991, p. 114.

concerned with accuracy as they were with making people from different ethnic or political groups easily distinguishable to the viewer, thus assigning each group a 'uniform' which may to a greater or lesser degree correspond to the garments and equipment actually used by those peoples.[51]

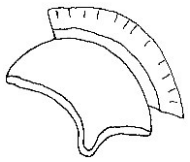

Figure 3.2: *Uratian helmet from the Balawat Gates of Shalmaneser III; after Madhloom 1970, pl. 19:7.*

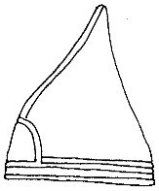

Figure 3.3*: Typical Assyrian conical helmet, similar to archaeologically-attested Urartian conical helmets; after Madhloom 1970, pl. 18:1.*

What is more, the forms of arms and armor depicted varied both through time and also, more significantly, with the medium upon which they were depicted. Thus the armor of Assyrian soldiers is different on both the reliefs and the Balawat Gates of Assurnasirpal II (different media), and also different between the Balawat Gates of Assurnasirpal II and those of Shalmaneser III (chronological change).[52] As Barron observed, chronological development in representations does not necessarily equate to technological development, being rather a reflection of development of iconography.[53] Thus depictions of military equipment must be viewed with some caution, particularly when they cannot be cross-checked with archaeological examples of the same kind of items (such as bows, none of which survive archaeologically).

3.2.2. Depictions of Tactics

Needless to say, the disconnect between depictions of arms and the actual form of arms raises questions regarding other aspects of Assyrian military activities, such as tactics and specifically in relation to the present study, how archery equipment was used by the Assyrian military. Yadin observed that reliefs were the most important source for the study of Assyrian tactics.[54] Royal inscriptions may give generalized overviews of some battles and administrative texts reveal a great deal about how the military was administered, however there is very little in the way of textual sources touching upon tactics. Therefore, iconography, or the "conventional" subject matter[55] of these depictions, is virtually our only source for information about tactics, and therefore consists of the principle source material used in modern studies of Assyrian tactics.[56] Nevertheless, this leaves us in

[51] A similar pattern has been observed on Trajan's Column; Lepper & Frere 1988, pp. 266-268.
[52] Barron 2010, p. 206
[53] Barron 2010, p. 206
[54] Yadin 1963, pp. 25-26
[55] Panofsky 1955, pp. 2-4
[56] e.g. Scurlock 1997; Fales 2010, pp. 192-205; De Backer 2009-2010 and 2013

the uncomfortable position of being unable to cross-reference what they tell us with other sources in order to gauge their accuracy.

This lack of contemporary comparative evidence has resulted in some studies applying categories and methods derived from modern military practice to matters depicted on Assyrian reliefs, though these may in fact have little or nothing to do with how the ancient Assyrians carried out warfare.[57]

One obvious factor that should immediately give warning when examining tactics in Assyrian reliefs is that all the battle scenes are necessarily "compressed" – the artist could not possibly show all of the participants in a battle (likely in the hundreds or thousands), so a much smaller number of individuals are depicted instead to represent the larger numbers that would have actually been present. In that alone, there is a level of interpretation, as the artist would have to decide who to include and who to exclude (see Figure 3.4).[58]

Figure 3.4: A typically "compressed" battle scene: a city defended by five men (including one falling from the ramparts) is attacked by six men; after Albenda 1986, pl. 98.

Nevertheless, reliefs and other depictions are our only source for most of these matters, and because they must bear some relationship to the realities they purport to depict, they must be analyzed for whatever information can be garnered. That information, however, must not be accepted at face value, in a purely empirical manner, but should instead invariably be tempered by the acknowledgement that these depictions tell us about the *representation* of tactics, not necessarily the

[57] For example, De Backer 2009-2010, though he himself acknowledged the somewhat hypothetical nature of his conclusions due to lack of relevant textual sources; de Backer 2009-2010, p. 265.
[58] Similar "compression" can be seen in much more recent monuments depicting battles that are far better known historically, such as the Arc du Triomphe in Paris and the Nelson Monument in London.

actual tactics themselves. How closely those representations relate to genuine Assyrian tactics cannot be accurately gauged due to the lack of other sources for comparison.

3.3. The bow as an attribute of deities

Bows were used as divine attributes as early as the 3rd Millennium BC, as several depictions of bow-weilding deities (identified as such by their horned headdresses) from the Old Akkadian Period attest.[59] In the Neo-Assyrian Period, bows featured prominently when deities were invoked, reflecting their importance as weapons of war. Fittingly for a god of war, Ninurta is depicted as an archer in the curses of the succession treaty of Esarhaddon, where the treaty-taker (Humbareš, king of Nahšimarti, his descendants, etc.) is warned that if he violates the treaty, Ninurta will "fell you with his fierce arrow."[60] Marduk seems to have been particularly associated with the bow, as several texts describe him as bearing one. The acrostic hymn of Assurbanipal mentions "…a bow, [merciless] arrows, swords, weapons of war,"[61] belonging to Marduk, and a cultic commentary mentions both the "merciless arrows from the quiver of Marduk,"[62] and how he, "with his bow in his hand cast down Ea."[63] Aššur is also figured as a bow-wielding deity, as one mythological text saying that he "put his arm in his quiver and drew out [an arr]ow…"[64]

Figure 3.5: The hands of a deity holding a bow while protruding from a winged disc, from the Broken Obelisk; after Curtis 2007, p. 54, fig. 1.

[59] Buchanan 1966, no. 328; Boehmer 1965, nos. 289, 324, 359, 377, and 390
[60] SAA II 6, 425
[61] SAA III 2, 18
[62] SAA III 37, 11
[63] SAA III 37, 20
[64] SAA III 36, r2

Iconographic depictions of deities with bows are also not uncommon. The Broken Obelisk from Nimrud, dating most likely to the reign of Aššur-bēl-kala in the 11th Century BC,[65] emphasizes the bow as a divine symbol by reducing the depiction of the deity (identified as Šamaš by Reade[66]) to a pair of hands emerging from a winged disc and holding a bow (see Figure 3.5). The reliefs of Assurnasirpal II have several examples of a god – never identified, but possibly Aššur or Šamaš[67] – in a winged disc, holding[68] or shooting[69] a bow (see Figure 3.6). A painted brick from the palace of Tukulti-Ninurta II at Assur also shows a winged god, perhaps Aššur, in a solar disc firing a bow (see Figure 3.8).[70] On Assyrian royal standards, Adad is shown firing a bow, sometimes standing on the back of a bull,[71] while on the Arslan Tash Stele, he brandishes lightning bolts while his bow is slung on his back.[72] Later royal standards also incorporate a bow-firing deity (see Figure 3.7).[73] Ištar is depicted on both cylinder and stamp seals holding a bow while astride a lion.[74]

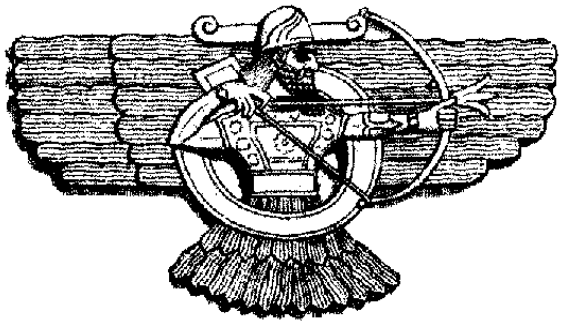

Figure 3.6: A deity in a winged disc firing an arrow (the stylized tip of which may represent a lightning bolt) from the reliefs of Assurnasirpal II; after Layard 1853a, pl. 13. (See Figure 4.15 for the larger context.)

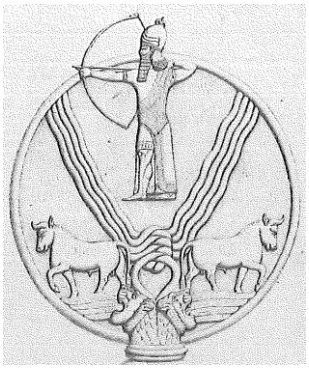

Figure 3.7: Standard from a chariot showing an archer god, perhaps Adad; after Albenda 1986, pl. 114.

The image of a deity in a winged disc is common throughout the 1st Millennium BC Near East,[75] however images of those deities holding bows tend to be limited to Assyria. Nevertheless, there are additional examples from Urartu (see Figure 3.9),[76] whose art was heavily influenced by Assyria.

[65] Curtis 2007, p. 53
[66] Reade 1977, p. 38
[67] Russell 1998, p. 686
[68] Budge 1914, pl. 17
[69] Budge 1914, pls. 14 & 18; a similar motif is found on a glazed brick (BM 115706) of Tukulti-Ninurta II from Assur, showing a winged god in a disc (rather than a god in a winged disc) firing a bow; Frankfort 1939, p. 212, text-fig. 64
[70] Parrot 1961, p. 227; Parrot identifies the deity as Assur on p. 226. Fales 2010, p. 88, agrees with this identification.
[71] Russell 1998, p. 686; Budge 1914, pl. 24 (see Barnett 1960, pl. 12 for detail)
[72] Black & Green 1997, p. 111, fig. 89
[73] Albenda 1986, pl. 114
[74] Frankfort 1939, pl. 35:a & Klengel-Brandt & Radner 2006, fig. 229
[75] see Parpola 1993, pp. 201-202
[76] e.g. Zutterman 2003, p. 162, fig. 5:4 and Zahlhaas 1993, pp. 47 & 50; note that these two deities are not in a proper winged disc, but rather in concentric circles emitting wavy lines, perhaps indicating a sun disc.

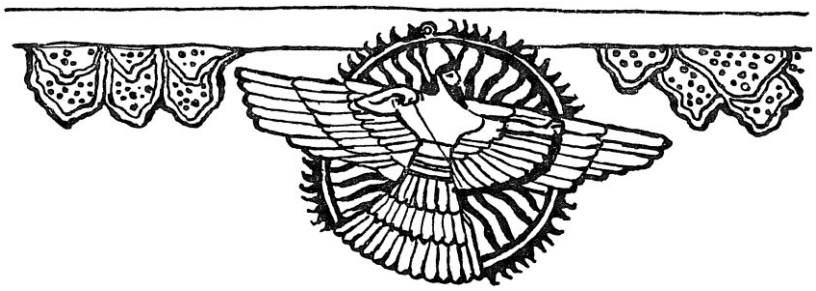

Figure 3.8: Winged deity in a disc firing a bow, depicted on a glazed brick of Tukulti-Ninurta II (BM 115706) found at Assur; after Frankfort 1939, p. 212, text-fig. 64.

Figure 3.9: A deity holding a bow astride a bull, from an Urartian bronze shield; after Zahlhaas 1993, p. 50, fig. 2.

Some depictions of hunting on seals are clearly representations of mythological scenes. Commonly, a man will hunt a mythological creature, such as a griffin, winged bull, scorpion-man, etc. (see §3.1 below). One scene that is not uncommon involves a striding deity firing a bow (sometimes spangled with stars) at a rearing winged monster (see Figure 3.10),[77] most likely a depiction of Ninurta fighting Anzû.[78]

[77] Delaporte 1923, pl. 86:11; Frankfort 1939, pl. 35b; Moortgat 1940, nos. 595 & 616; Porada 1948, nos. 689, 690, 719 & 720; Keel-Leu & Teissier 2004, nos. 225 & 226
[78] Black & Green 1992, p. 14; Winter 2009a, p. 137

Figure 3.10: Scene from a Neo-Assyrian seal presumably depicting Ninurta fighting Anzû; after Black & Green 1992, fig. 6 (see Porada 1948, no. 689 for original seal).

3.4. The bow as a symbol of military capacity

While the sword was also used at times as a symbol of military power,[79] the bow occupied a position of preeminence. Assurbanipal, for example, stated in one of his royal inscriptions that the bow was "the sign of my valor."[80] This was due, at least in part, to the fact that the bow was one of the most commonly-used weapons of war in the early 1st Millennium BC.[81] That it required a great deal of skill to use effectively also doubtless played a role, since depicting the king as deadly with a bow implies a considerable degree of martial skill.

In palace reliefs, the king is often shown holding a bow, even when not engaged in battle (see §3.6), which is clearly meant to symbolize his military might. Textual sources echo this. For example, SAA III 22, which celebrates Assurbanipal's victory over Elam proclaims, "May Aššur and Bel bless you, may Nabû strengthen your bow!"[82] Assurbanipal, in his hymn to the Ištars of Nineveh and Arbela, states that it is "not with the strength of my bow, but with the power [... and] strength of my goddesses, I made the lands disobedient to me submit to the yoke of Aššur."[83] While it was with divine aid that he asserted his authority, the text implies that the more typical manner of doing so is by the strength of one's bow, i.e. by military force.

[79] e.g., in the inscriptions of Shalmaneser III, a frequent expression is some variant of "I felled [the enemy's] fighting men with the sword." See Grayson 1996, A.0.102.1 53'-64'a, A.0.102.1 64'b-80', A.0.102.2 i 29b-36a and i 36b-39, etc.
[80] tablets K3050 & 2694; Luckenbill 1927, p. 379
[81] As attested by the frequent depiction of archers in iconographic sources (see §4.2), as well as administrative texts that indicate that mention hundreds and even thousands of archers (e.g. SAA XVII 70, 4-11, which quotes the king calling for 1000 archers to be sent to him and also mentions 20,000 archers; see also Malbran-Labat 1982, pp. 77-79).
[82] SAA III 22, r 15
[83] SAA III 3, r04

A rare exception to the focus on the bow as symbolizing the king's military power is the Epic of Na'id-Šihu, a fragmentary epic text. In it, the king commands Na'id-Šihu, an officer leading the king's army, "let them bring to me the booty captured by your bow."[84] It is perhaps not surprising that the subject of an epic text will have his heroism emphasized; that it is at the expense of the king is unusual. A very similar image is used in the inscriptions of Esarhaddon, which refer to defeated enemies "plundered by my bow."[85]

The bow could also symbolize the military power of opponents of Assyria in Assyrian sources. For example, an inscription of Adad-nirari II describes how a local ruler in Hanigalbat (Mitanni) rebelled against Assyria, "trusting in his fortified city, his strong bow, his extensive troops, and the Aramaeans…"[86] However, perhaps the most common use of the bow as a symbol of the military power of non-Assyrians is the breaking of the bow, which symbolized its loss. In the curse section of treaties, Ištar is frequently called upon to break the bow of the treaty-breaker in the midst of battle, using the set phrase, "May Ištar break his bow in the thick of battle and have him crouch at the feet of his enemy," (with minor variants).[87] Esarhaddon's succession treaty invokes all of the gods called upon in that treaty to both break the bow and "turn over the bow" in the hands of the treaty-breaker.[88] This same treaty also calls upon Ninurta to "fell [the treaty breaker] with his swift arrow."[89]

Perhaps the most eloquent expression of the bow as a symbol of military power is an episode from the reliefs of Assurbanipal dealing with the defeat of the Elamite king Teumman, where a defeated Elamite officer, Ituni, uses his sword to cut his own bow in half, signifying his surrender.[90] This seems to have been such a potently symbolic scene that it was depicted twice by Assurbanipal, once in the Southwest Palace of Nineveh[91] and once in the North Palace of Nineveh (see Plate 1A).[92] The North Palace provides a caption describing the event thus:

> "Ituni, the *šūt-rēši* of Teumman, king of Elam, whom he insolently sent against me, saw my powerful onslaught. With his own hand he drew the iron dagger from his belt and cut his bow, the trusted companion of his arm."[93]

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[84] SAA III 50, 25
[85] e.g. RINAP IV, Esarhaddon 1, iii 10 and v 48; RINAP IV, Esarhaddon 2, i 35 and iv 44; RINAP IV, Esarhaddon 5, vi 2'; RINAP IV, Esarhaddon 6, ii' 33'
[86] Grayson 1991, p. 150 (Adad-nerari II, A.0.99.2, 50
[87] SAA II 4, r.2; SAA II 6, 453; SAA II 9, r24. In SAA II 5, r.e. 18, the same formula is used, however the name of the goddess is given as Astarte rather than Ištar. In SAA II 2, v 8, Ištar is called on to "take away" the bow rather than break it.
[88] SAA II 6, 573
[89] SAA II 6, l.425
[90] Another interpretation is that Ituni "killed" his bow so that it could not be resued; Collon 2008, p. 99.
[91] Russell 1999, p. 174
[92] Russell 1999, p. 176
[93] Russell 1999, p. 173

3.5. Symbol of royal mandate from the gods

According to the ideology expressed in official Assyrian texts and mounments, the king's authority was based on a mandate from the gods, and the gods gave their chosen king the military power to enforce that mandate (or destroy the power of other kings). That power was sometimes symbolized by the bow. For example, according to Ornan, the hands holding a bow and protruding from a winged disc on the Broken Obelisk of Aššur-bēl-kala (see Figure 3.5) represent the divine source of the king's victories, symbolized by the deity handing a bow to the king.[94]

The image of the king receiving his bow from a god is also reflected in textual sources. In a number of instances, the divine benefactor is the god Aššur,[95] no doubt due to his role as the head of the Assyrian pantheon. For example, RINAP III, Sennacherib 23 states "I took in my hand the mighty bow that the Aššur had granted me (and) I grasped in my hand the arrow that cuts off life."[96] A similar reference is found in RINAP IV, Esarhaddon 8, saying"I held in my hands the mighty bow (and) the [strong] arrow, which the god Aššur, king of the gods, placed [in my] hands."[97] Furthermore, in a literary letter, the god Aššur says to Assurbanipal, "I smashed the [bo]ws of Elam, and strengthened your bow. I made your weapons stronger than those of all (your) enemies."[98] Another fragmentary literary letter has the deity say, "I desired you, I picked you out for shep[herdship ....., and sent you with] mighty weapons, sharp arrows, and flaming [swords] to fell [my] enemies."[99] Thus archery equipment symbolized the broken military power of enemies (the smashed bows of Elam) as well as the dominant military strength of Assyria (the king's sharp arrows).

Ištar, as goddess of battle, also sometimes fills the row of divine bow provider. RINAP IV, Esarhaddon 1 states "Ištar, the lady of battle and war, gave me a mighty bow (and) a fierce arrow as a present,"[100] while RINAP IV, Esarhaddon 98 says that "Ištar, the lady who loves my priestly service, put in my hands a strong bow (and) a mighty arrow, slayer of the disobedient,"[101] Thus, Ištar both provides the king with his bow and breaks the bows of his enemies (see §3.4).

[94] Ornan 2007, p. 70
[95] A late 2nd Millennium BC inscription of Tiglath-Pileser I has the gods Nergal and Ninurta providing the king with his bow, though in the context of hunting rather than warfare; Grayson 1991, p. 25 (Tiglath-Pileser I, A.0.87.1, vi 55-62)
[96] RINAP III, Sennacherib 23, v61-62; repeated on RINAP III, Sennacherib 18, v 11'b
[97] RINAP IV, Esarhaddon 8, ii' 8'-9'
[98] SAA III 44, r5
[99] SAA III 46, 8
[100] RINAP IV, Esarhaddon 1, ii 38-39
[101] RINAP IV, Esarhaddon 98, r 28b

3.6. The king (or others) holding a bow and two arrows

As it serves as a symbol of military might, it is not surprising that depictions of the king often show him wielding a bow. The most typical manner of depiction has the king holding a bow in one hand and two arrows in the other. This theme appears in the reliefs of Assurnasirpal II,[102] Tiglath-Pileser,[103] and Sennacherib,[104] as well as the Balawat Gates of Shalmaneser III.[105] It is not repeated in the reliefs of Assurbanipal, however, and in the two reliefs of Sargon where this theme is used, it is not the king holding a bow and two arrows, but rather an attendant[106] and an enemy archer,[107] respectively.

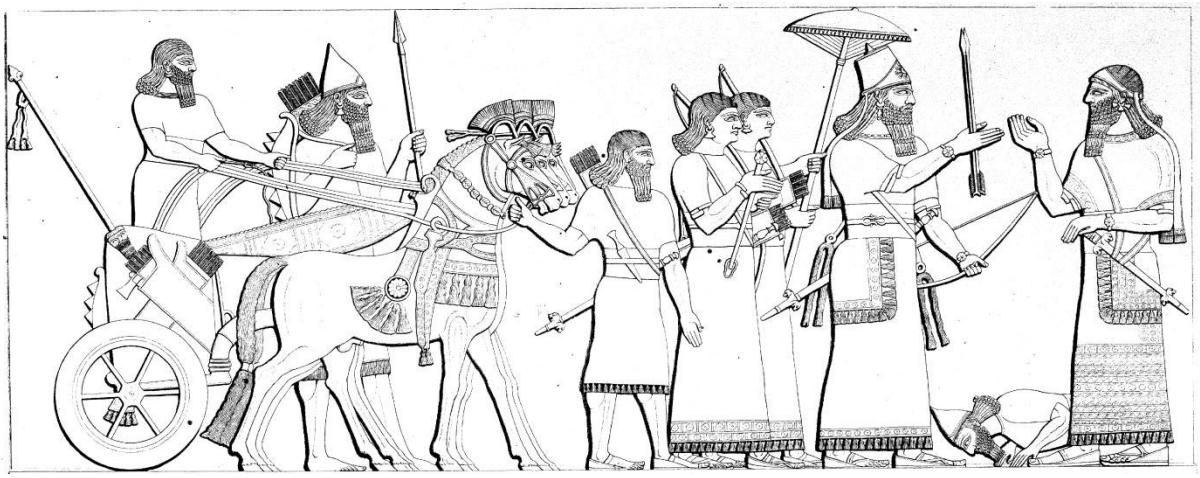

Figure 3.11: Assurnasirpal II holding a bow and two arrows; after Layard 1853, pl. 23 (drawing of Budge 1914, pl. 23).

This theme is first attested only just before the Neo-Assyrian Period. Russell observed that the earliest known example of the visual theme of the king holding a bow and two arrows is on a kudurru of the 11th Century BC Babylonian king Marduk-nādin-aḫḫē.[108] In Neo-Assyrian reliefs, this motif is attested most heavily in the reliefs of Assurnasirpal II, where it appears in a variety of contexts. These include the king on campaign,[109] receiving prisoners (see Figure 3.11),[110] and religious

[102] Budget 1914, pls. 13 (including an enemy holding a bow and two arrows), 17, 20, 22, 23, 25, and 33
[103] Barnett & Falkner 1962, pl. 59
[104] Barnett, Bleibtreu & Turner 1998, pl. 335
[105] King 1915, pls. 15, 28, 34(?), 41, 52, 57, 62, and 73
[106] Albenda 1986, fig. 76
[107] Albenda 1986, fig. 88
[108] Russel 1998, p. 684. An Uruk Period seal has a similar motif, however, with an archer firing a bow while an attendant holds two arrows; see Collon 2008, p. 105, fig. 5.
[109] Budge 1914, pls. 17, 22 & 25
[110] Budge 1914, pls. 20 & 23

ceremonies.[111] There are even two cases where enemies are shown holding a bow and two arrows (though not actively using them).[112]

The Balawat Gates of Shalmaneser III also contain a number of scenes with the king holding a bow and two arrows, but now they are all in the same context: the king receiving prisoners and tribute.[113] The Black Obelisk shows the king holding a turned bow and two arrows while receiving the tribute of Gilzānu (see Plate 1B). After Shalmaneser III, depictions of the king holding a bow and two arrows become far less common. There is one example in the reliefs of Tiglath-Pileser III, where the king receives prisoners (see Figure 3.12).[114] In the reliefs of Sargon II, the king is not shown in this motif, but an attendant holding a bow and 2 arrows in a hunting scene is,[115] as does a lone (possibly enemy) archer in a badly damaged context.[116] However, in the reliefs of Sennacherib, we see a return to this motif in a single scene where the seated king is receiving tribute and submission (see Figure 3.18).[117] While the bow-and-two-arrows motif has mostly been used in scenes of the king receiving tribute or prisoners, in the reign of Assurbanipal, the sole example is a return to the king holding a bow and two arrows in a religious ceremony (pouring a libation; see Figure 4.4),[118] a context in which it is not attested since the time of Assurnasirpal II.

Figure 3.12: Tiglath-Pileser III holding a bow and two arrows; after Barnett & Falkner 1962, pl. 59.

[111] Budge 1914, pls. 19 & 33
[112] Budge 1914, pls. 13 & 24
[113] King 1915, pls. 15, 28, 34?, 41, 52, 57, 62 & 73, though in two scenes, pls. 14 & 35, the king only holds a bow and no arrows.
[114] Barnett & Falkner 1962, pl. 59
[115] Albenda 1986, fig. 76
[116] Albenda 1986, fig. 88
[117] Barnett, Bleibtreu & Turner 1998, pl. 335
[118] Barnett 1976, pl. 56

Russell regarded the holding of a bow and two arrows by the king to be a symbol of his might.[119] Certainly, in at least some context, the bow and two arrows are intended as just such a symbol. For example in Room G of the Northwest Palace at Nimrud, representations of Assurnasirpal II holding a bow and two arrows alternate with representations of him holding a bowl for libations emphasized, alternately, his worldly (military) power, and the source for that worldly power, which was his devotion to the gods.[120]

However, this leaves the question of the scenes in which individuals other than the king are depicted holding a bow and two arrows. In some cases (such as when the king's attendants hold a bow and two arrows), the motif may be intended to display military might on behalf of the king, however this is certainly not the case when enemies are depicted holding a bow and two arrows.[121] That it is invariably two arrows being held, rather than one or three or any other number may be significant. One could speculate that a single arrow would be more apropos, since that would show the king (or his representative) with both weapon and ammunition, ready to fire. Some reliefs show archers (including the king) firing one arrow while still holding a second vertically in the hand they are drawing the bow string with.[122] This suggests that holding two arrows could simply have been a common way for archers to be prepared to fire two shots in rapid succession, and while it may at times be used to indicate military might, at others (particularly when enemies are doing so) is may simply be an indication that the individual was well-prepared for battle.

3.7. The "turned bow"

Among the depictions of the king holding a bow, perhaps the most discussed are those where the king holds the bow so that the string is turned away from him (called the "turned bow" by Wilkinson and "parade rest" by Paley[123]). Root observes that, in Assyrian palace reliefs, the turned bow is evident in scenes of victory. The sole exception is found in the reliefs of Assurnasirpal II, where the turned bow also appears "as an abstract symbol of the king's power and prowess which is not linked contextually to a specific episode of victory."[124] Wilkinson objected to the assertion that the turned bow was related to victory and argues that it rather signified the dominance of the individual holding the turned bow,[125] the implication being that the king dominates the other parties so completely that they cannot conceivably put up any resistance to the king, so he can even turn his own weapon to point at himself or hold it in such a way that it cannot be used immediately. If this is the case, it may be comparable to

[119] Russell 1998, p. 684
[120] Russell 1998, p. 686-687
[121] e.g. Budget 1914, pls. 13 & 24; Albenda 1986, fig. 88
[122] Budge 1914, pl. 13 (the king in the upper register and an Assyrian archer in the lower)
[123] Westenholz 2000, p. 115
[124] Wilkinson 1991; Root 1979, p. 167
[125] Wilkinson 1991, pp. 85-86

depictions of the king holding a mace close to the mace head, rather than near the base, which would render it ineffective until the grip was properly adjusted.[126]

Wilkinson's arguments are based on his observation that the turned bow is not always depicted in circumstances where one would expect it.[127] However, as Wilkinson observed that the same motif was used as early as the reign of Narām-Sîn on his Victory Stele (see Figure 3.13),[128] he seems to assume that its usage and meaning were consistent through the Neo-Assyrian Period, which is questionable give the amount of time that separated Narām-Sîn from the Neo-Asyrian Period, and the fact that the pose is not identical: Narām-Sîn holds his turned bow across his chest, while in all Neo-Assyrian examples, the turned bow is held in front of the body.

Figure 3.13: Narām-Sîn holding a turned or reversed bow on his Victory Stele; after Black & Green 1997, p. 95, fig. 75.

A survey of Neo-Assyrian reliefs shows that far from being a static, ancient, unchanging symbol, the usage of the turned bow motif changed considerably throughout the Neo-Assyrian Period (see Table 1 on page 45 for summary chart). These fluctuations may account for the discrepancies observed by Wilkinson. It does not contradict the possibility that the basic meaning of the motif was to project the dominance of the Assyrian king. However, at certain times and in certain contexts, it does indeed appear to have been directly related to military victories, and also in other contexts does not appear to have signified dominance or victory at all.

[126] see Albenda 1969, pp. 46-47
[127] Wilkinson 1991, pp. 85
[128] Wilkinson 1991, pp. 84; a similar pose appears on several Old Akkadian seals as well; see Boehmer 1965, nos. 377 & 390, and Collon 2008, p. 105, fig. 9

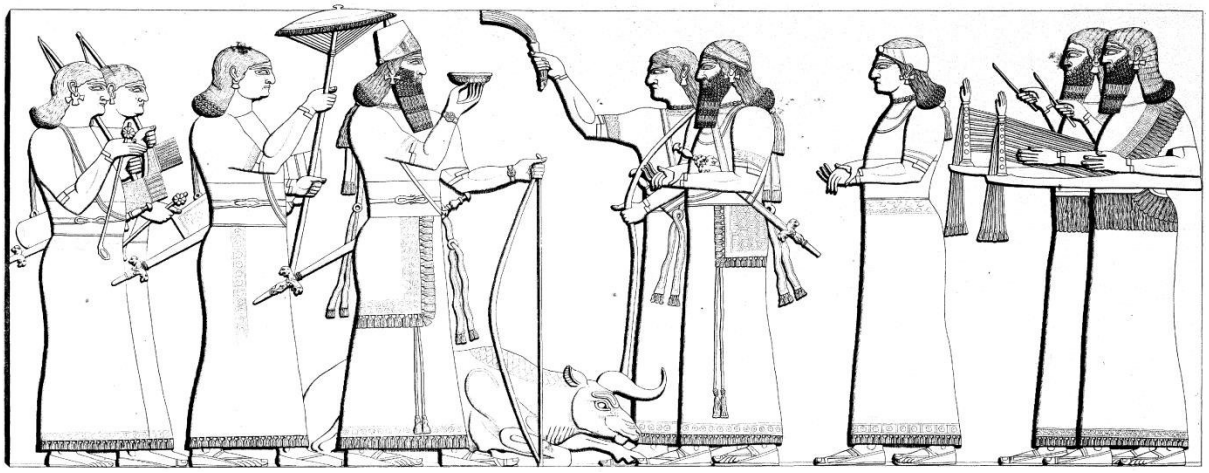

Figure 3.14: Assurnasirpal holds a turned bow while performing a libation after a hunt; after Layard 1853a, pl. 12 (drawing of Budge 1914, pl. 19).

The reliefs of Assurnasirpal II from the Northwest Palace in Nimrud show him holding a turned bow in scenes not related to warfare, specifically pouring libations over dead animals after a hunt,[129] participating in the ritual of fertilizing the palm tree (while holding two arrows as well),[130] and standing before an official or attendant (holding a cup in his other hand).[131] In the libation scene and that with the attendant, the turned bow may indeed have signified dominance, however it is very unlikely that this is the case in the palm tree fertilization ritual, so the turned bow most likely had a different significance in that context. In warfare-related scenes (such as receiving prisoners or riding his chariot on campaign), the king is always shown holding his bow so it points downwards.[132] There is one case where the downward-pointing bow is curiously inverted: the king, returning from battle in his chariot, holds his bow as if pointing downward, but rotated in his grip so the string is lowermost. Furthermore, a deity in a winged disk above him holds a bow in exactly the same manner (see Figure 3.15).[133] However, enemy soliders are also shown holding their bows string-down on the bronze bands decorating the palace of Assurnasirpal II at Balawat (see Figure 4.9).[134] Thus, perhaps the string-down position was not ideologically significant, but merely a realistic depiction of a convenient and perhaps common way to hold a bow when one does not intend to use it immediately. These same gates also show Assurnasirpal II holding a turned bow while greeting his officials,[135] and the bronze bands from the gate of the contemporary Temple of Mamu at Balawat repeats this motif in two

[129] Budge 1914, pl. 19. Fragments of a very similar relief of Assurnasirpal II holding a turned bow during a post-hunt libation were found in the Temple of Ištar in Nineveh; see Reade 2005, p. 379, fig. 19.
[130] Budge 1914, pl. 33
[131] Budge 1914, pl. 35. Also on a glazed brick from Nimrud; see Reade 1998, p. 44, no. 44.
[132] Budge 1914, pls. 20, 22, 23 & 25
[133] Budge 1914, pl. 17
[134] Curtis & Tallis 2008, figs. 19, 25 & 27
[135] Curtis & Tallis 2008, fig. 23

different scenes.[136] The Rassam Obelisk of Assurnasirpal II shows the king holding a turned bow while greeting officials who lead tribute-bearers,[137] a theme much used by Shalmaneser III, and one which one could certainly interpret as a display of dominance as Wilkinson suggests.

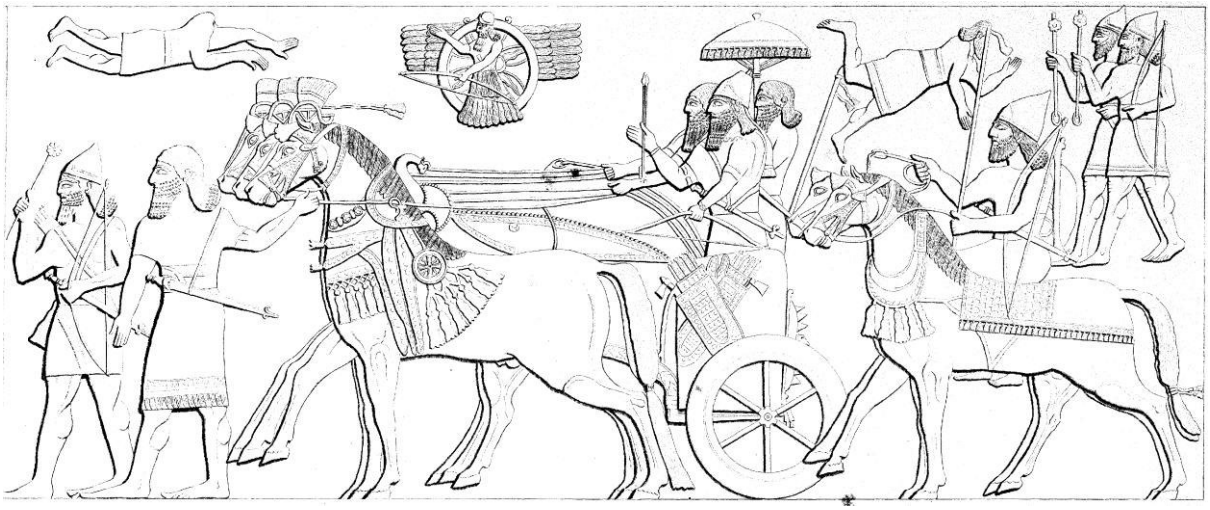

Figure 3.15: King and deity in winged disc both hold bow with string lowermost; after Layard 1853a, pl. 21 (drawing of Budge 1914, pl. 17).

On the Balawat Gates of Shalmaneser III, the king always holds a turned bow, usually with two arrows, when he received tribute or prisoners. [138] However, this is not the case when he is seated in a pavilion (where he either holds the bow pointing down[139] or holds no bow at all[140]). Both pavilion scenes are warfare-related (watching a battle and receiving tribute), as the turned bow scenes are, so it is not clear why the turned bow would not be used in the pavilion scenes as well, particularly when it is used in a pavilion scene from Assurnasirpal II.[141] The throne base from Fort Shalmaneser also contains two depictions of the king holding a turned bow while greeting his officials, who lead tribute-bearers.[142] The Black Obelisk exhibits something of an incongruity. In two nearly identical scenes (see Plate 1B), the king receives the submission of foreign rulers. In the top scene (receiving tribute from Sūa of Gilzānu[143]), he holds a turned bow, however in the bottom scene (receiving tribute from Jehu of the House of Omri[144]) he does not. This inconsistency may have been for aesthetic reasons, to prevent these two scenes, one directly above the other, from being too visually similar. However, it is also worth nothing that the attendants behind the king where he holds a turned bow are

[136] Curtis & Tallis 2008, figs. 57 & 95
[137] Reade 1980a, pl. 2
[138] King 1915, pls. 14, 15, 28, 34, 35, 41, 57, 62 & 73
[139] King 1915, pl. 52
[140] King 1915, pl. 20
[141] Curtis & Tallis 2008, fig. 95
[142] Oates 1963, pls. 4b & 6a
[143] Grayson 1996, pp. 148-149 (No. 87)
[144] Grayson 1996, p. 149 (No. 88)

much more heavily armed than those where he does not. Thus perhaps the intent was to give the upper scene a more martial air than the lower, though why this should be is unclear, given that the one mention of Gilzānu in the text of the Black Obelisk inscription merely states that tribute was given, with no mention of violence.[145]

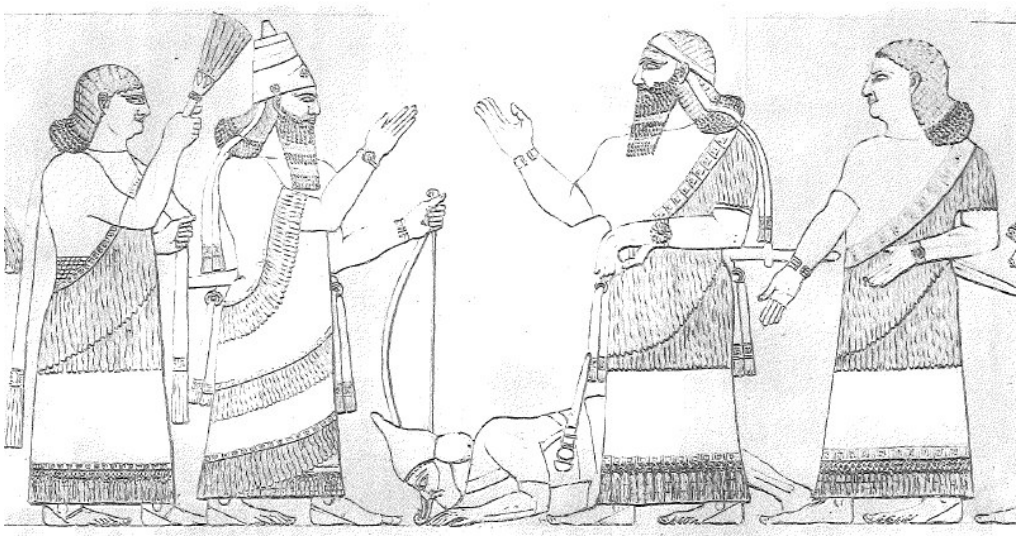

Figure 3.16: Tiglath-Pileser III receives prisoners while holding a turned bow; after Barnett & Falkner 1962, pl. 84

The reliefs of Tiglath-Pileser III from the Central Palace at Nimrud are also rather ambiguous, with many different uses of the bow. Tiglath-Pileser III 84 depicts the king holding a turned bow while receiving the submission of an enemy (see Figure 3.16),[146] however in another scene, he holds his bow pointing forward as he receives prisoners and spoils (see Figure 3.12).[147] In Tiglath-Pileser III 18, the king receives prisoners while holding no bow at all, but rather a staff and a lotus blossom.[148] Barnett & Falkner speculated that the prisoner's life is being spared, as the lotus was a symbol of life,[149] therefore the lack of a bow could have simply been the result of the need to show the king holding a lotus instead. The king also is shown holding his bow pointing down as he converses with his officers,[150] with no bow at all during the capture of a city,[151] and holding both a spear and a bow, pointing forward, while he treads on the neck of an enemy.[152] BM 127065, an ivory panel from the Central Palace, perhaps dating to the reign of Tiglath-Pileser III, depicts the conventional scene of the

[145] Grayson 1996, pp. 70-71 (A.0.102.14, 180-181). This reflects the pattern found in other inscriptions, where Gilzānu pays tribute (primarily in horses) and is spared violence even when other nearby cities are not; Marcus 1987, p. 88.
[146] Barnett & Falkner 1962, pl. 84
[147] Barnett & Falkner 1962, pl. 59
[148] Barnett & Falkner 1962, pl. 18
[149] Barnett & Falkner 1962, p. xvii
[150] Barnett & Falkner 1962, pl. 86
[151] Barnett & Falkner 1962, pl. 68
[152] Barnett & Falkner 1962, pl. 89

king holding a turned bow, receiving an official.[153] Thus, the bow is employed by Tiglath-Pileser III as a symbol of dominance, but in a far less standardized manner than that employed by Shalmaneser III.

Sargon II, by contrast, is very consistent in his usage of bow position in the Khorsabad reliefs: when he wields a bow, it is invariably pointing downward (see Figure 3.17).[154] This could, however, be the result of the small sample available. The reliefs at Khorsabad were heavily damaged in the fire that destroyed the palace, and some of those that survived the fire and the millennia underground were lost when the boat and rafts carrying them down the Shatt al-Arab for Victor Place were sunk during an attack by bandits in 1855.[155] Among the reliefs that have survived, there are only three scenes of the king holding a bow. In all of them, the king is standing in his chariot, and this may have also had an effect on the position that he held his bow in (akin to the differences in bow position in the Balawat Gates of Shalmaneser III depending on hether he was seated in a pavilion or not). As there are no surviving scenes of him holding a bow while standing on the ground, there is no way to be certain. Nevertheless, there does seem to be a consistency in the gestures depicted, but unlike Shalmaneser III, the bow is pointed down rather than turned. A downward pointing bow could indeed still serve as a symbol of dominance, since, like the turned bow, it is clearly not ready for immediate firing.

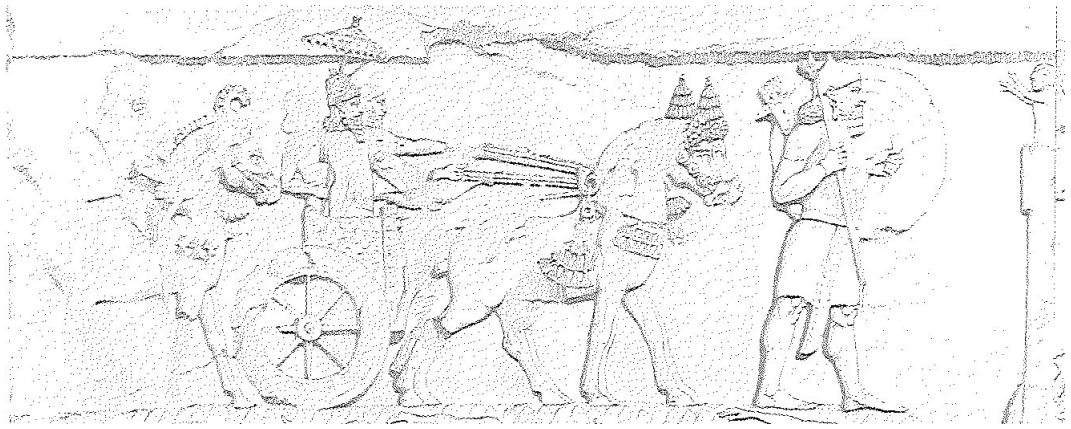

Figure 3.17: Sargon II holding a downward-pointing bow while riding a chariot; after Albenda 1986, pl. 120.

Like Sargon II, Sennacherib holds a downward-pointing bow while riding in his chariot in warfare-related scenes in the Southwest palace at Nineveh.[156] The turned bow does show up once in Sennacherib's reliefs, held by the king as he sits in his throne (contrary to the examples of

[153] Herrmann & Laidlaw 2009, p. 230, pl. 125 (BM 127065)
[154] Albenda 1986, pls. 111, 120 & 129
[155] Albenda 1986, pp. 29-30
[156] Barnett, Bleibtreu & Turner 1998, pls. 48, 132, 379, 466

Shalmaneser III), receiving his officers along with prisoners and booty from Lachish (see Figure 3.18).[157]

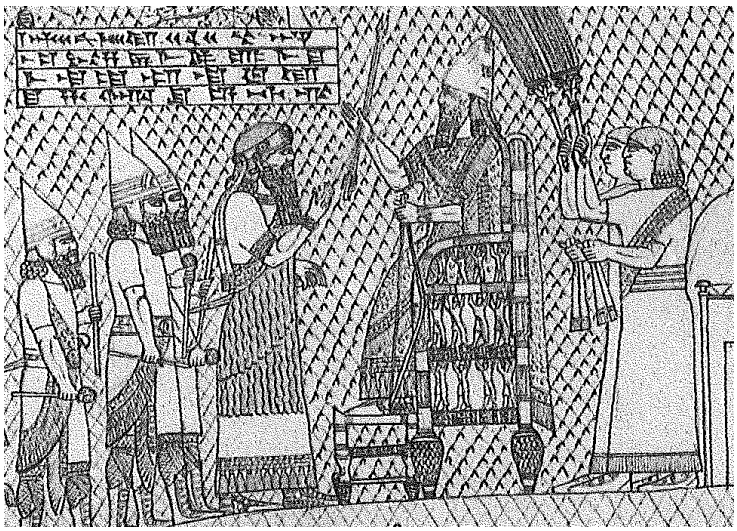

Figure 3.18: Sennacherib holding a turned bow while seated in a throne, recieving an official after the defeat of Lachish; after Barnett, Bleibtreu & Turner 1998, pl. 342.

Finally, in the reliefs of Assurbanipal from the North Palace at Nineveh, the bow is conspicuously absent from the scenes it would normally be associated with. Assurbanipal does not appear to hold a bow in any of the six scenes where he stands in his chariot, receiving prisoners and booty.[158] He does hold a bow in a ritual context – pouring libations on a lion he killed (see Figure 4.4), but in this case, the bow is pointing forward, contrary to the examples from Assurnasirpal II.[159] Assurbanipal's reliefs in the Southwest Palace, however, do contain one scene of the king holding a downward-pointing bow while riding in his chariot in a military procession.[160]

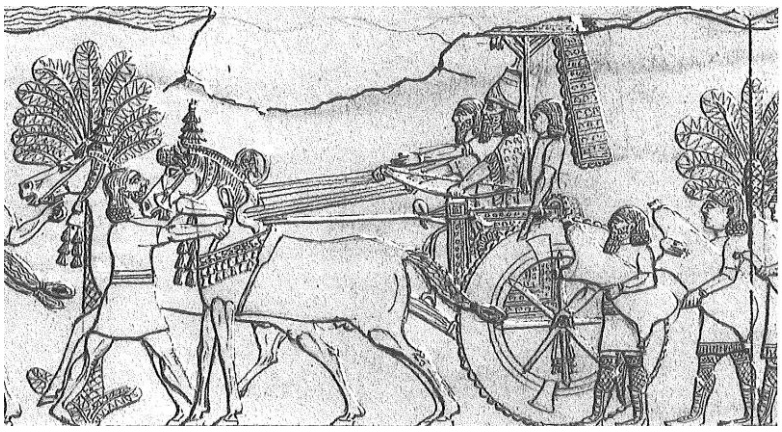

Figure 3.19: Assurbanipal holds downward-pointing bow in his chariot, from Court XIX of the Southwest Palace; after Barnett, Bleibtreu & Turner 1998, pl. 191.

[157] Barnett, Bleibtreu & Turner 1998, pl. 342
[158] Barnett 1976, pls. 16, 21, 35, 60, 67 & 68; Barnett, Bleibtreu & Turner 1998, pl. 205
[159] Barnett 1976, pl. 56
[160] Barnett, Bleibtreu & Turner 1998, pl. 191

The turned bow motif was also frequently employed on seals, typically in devotional scenes (see Figure 3.20 and Plate 2A). This typically took the form of a figure with a turned bow resting on the ground in one hand and holding a cup up in the other hand (perhaps to perform a libation) while standing before the gods (or symbols of the gods),[161] very similar to devotional scenes in the reliefs of Assurnasirpal II.[162] The figure holding the turned bow is identifiable as the king (by wearing the royal crown) only in a small percentage of these scenes. The supplicant is typically bare-headed, and thus while it could still represent the king, it could equally represent an official or the owner of the seal.[163] While these scenes tend to be very uniform, there is one example where the bow held by the king faces forward rather than being turned and he also does not hold a cup up in his other hand.[164] This example is from Babylon, however the appearance of a forward-pointing bow in Assurbanipal's post-hunt libation scene[165] suggest that this is not simply a reflection of regional differences in iconography. It is difficult to support the notion that the turned bow signifies domination in devotional scenes, given that the individuals depicted are generally not the king and that they do not stand before vanquished enemies, but rather altars and symbols of deities. Thus the turned bow, in this context at least, may have a cultic siginificance, the nature of which is obscure as no textual sources elucidate it.

Figure 3.20: Devotional scene where a man holds a turned bow and a cup before an altar; after Keel-Leu & Teissier 2004, p. 405, fig. 192.

A further turned bow motif is attested on seals. A goddess – most likely Ištar - is sometimes depicted standing on a lion and holding a turned bow in her hand (see Plate 2B).[166] However, similar scenes show Ištar holding a bow facing forwards rather than turned (see Plate 2C),[167] so the turned bow itself may not be significant in this context. It could also perhaps be due to the fact that in the former, the goddess is confronted by a worshipper, while in the second (a stamp seal), the goddess is depicted

[161] Delaporte 1923, pl. 87:18 (A.675) & 88:1 (A.676); Frankfort 1939, pl. 34e; Moortgat 1940, nos. 665, 667, 670 & 671; Porada 1948, nos. 647, 664-672; Parker 1962, pl. 9:3 (ND. 5247) & pl. 17:9 (ND. 6083); Buchanan 1966, nos. 601 & 602; Keel-Leu & Teissier 2004, nos. 190-192
[162] Budge 1914, pls. 19, 33 & 35
[163] Winter 2009a, pp. 129-130 & Porada 1948, p. 79-80
[164] Moortgat 1940, no. 600
[165] Barnett 1976, pl. 56
[166] Frankfort 1939, pl. 35:a
[167] Klengel-Brandt & Radner 2006, fig. 229 (VA ASS 5887)

alone. It is tempting to posit that, in order to coinvey its ideological content, the turned bow may require an "audience" within the composition itself. In most other examples of the turned bow, the turned bow faces a subordinate, an altar, etc. However, the considerable inconsistency with which the turned bow motif is employed in reliefs, even in identical contexts, suggests that this may also very well be a factor of chronological development or even natural variation.

The turned bow motif also appears on two different artifacts from Hasanlu. The well-publicized gold bowl from the Burned Building 1, dating to the end of the 2nd Millennium BC or beginning of the 1st,[168] includes one image of an archer, possibly the same "hero" depicted in the central wrestling scene,[169] holding a turned bow (see Figure 3.21). The context is rather ambiguous, as the archer is not apparently interacting with any of the other figures on the bowl. A silver beaker, also from Burned Building 1, contains a battle scene in which one figure holds a turned bow in one hand and brandishes a spear in the other (see Figure 3.22). While the beaker is decorated in the "local style" of Hasanlu, the composition of the battle scene reflects the Assyrian influence evident on other artifacts from Hasanlu IVB.[170] Whether the turned bow motif had the same meaning (or meanings) in their context in Hasanlu is debatable as the figure on the gold bow does not interact with others (so does not clearly dominate anyone) and the relationship of the archer on the silver beaker to the other individuals is far from obvious. The primary figure (or "hero" of the composition) may well be the charioteer, and thus the archer presumably his subordinate or an enemy, though it may also be another depiction of the hero, as on the gold bowl. Should this be the case, then the turned bow may well signify dominance, however, the brandished spear contradicts the presumed rationale behind the turned bow motif (the bow is not ready to use, signifying that the ruler/hero is in control and does not even need to use it, however the brandished spear is ready for immediate use).

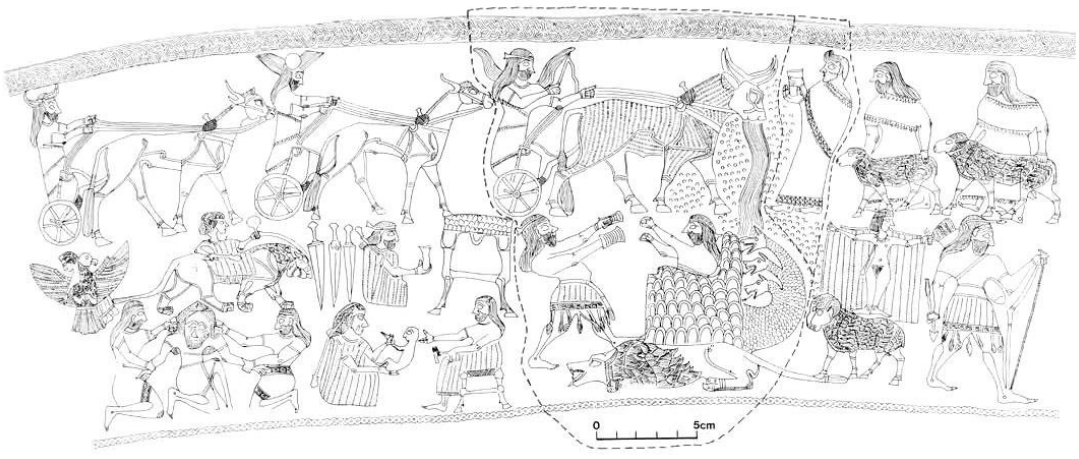

Figure 3.21: An archer holding an arrow and a turned bow (lower right) on the gold bowl from Burned Building 1, Hasanlu; after Winter 1989, p. 90, fig. 6.

[168] Winter 1989, pp. 90-92
[169] Winter 1989, p. 98
[170] Winter 2009c, p. 439

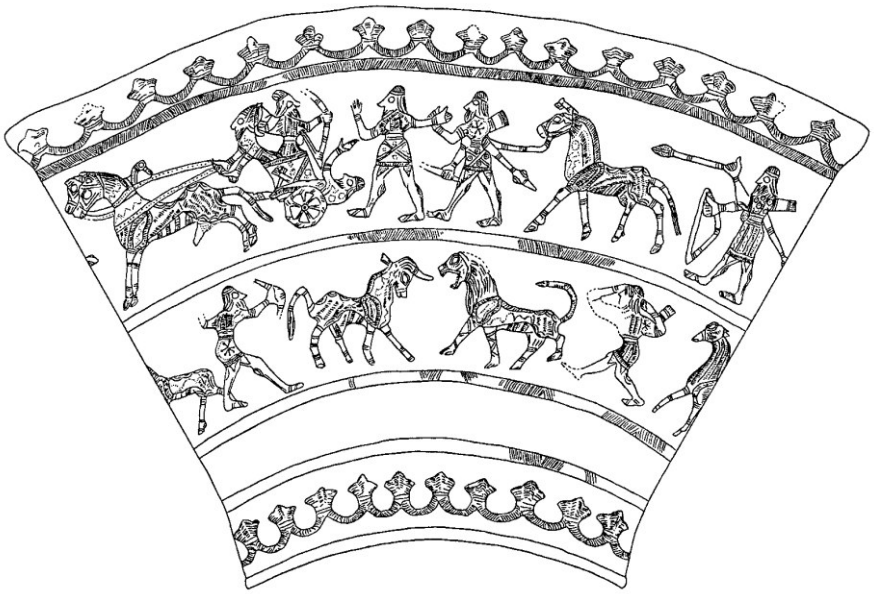

Figure 3.22: Decorated silver beaker from Burned Building 1 at Hasanlu. An individual holding a turned bow and a raised spear is involved in the battle scene in the top register (far right); after Winter 2009c, p. 456, fig. 1b.

A general pattern is evident in the usage of the turned bow motif on official iconography through the Neo-Assyrian Period (see Table 1). In the reign of Assurnasirpal II, the turned bow was used in ritual contexts, however shortly thereafter, under Shalmaneser III, it was used extensively in situations of military victory, signifying the triumph – and perhaps dominance – of the Assyrian king. This usage, however, had become obscured by the time of Tiglath-Pileser III, where it was used alongside other gestures, such as the downward-pointing bow, to apparently project the same basic meaning: victory and dominance. The turned bow is thereafter almost completely absent from Assyrian palace reliefs, replaced, it would seem, with the downward-pointing bow. There is just one attestation, where Sennacherib holds one while sitting in his throne. By the time of Assurbanipal, we find that the turned bow has been replaced by a forward pointing bow even in the pouring of libations after a hunt.

Seal depictions, on the other hand, focus almost exclusively on devotional scenes, and in virtually all cases the bow is turned. The individual performing the ritual on these seals may have been intended to be the seal owner himself, and this may explain why seals focus on this motif. While most usages of the turned bow (receiving prisoners, etc.) are limited to the king himself, the ritual with the turned bow and the libation bowl appears to have been one performed by the king as well as other high-status individuals, thus it appears both in official iconography as well as personal seals.

Motif	Date	Context
bow held string-down	Assurnasirpal II	king receiving prisoners/tribute
bow held string-down	Assurnasirpal II	king riding in chariot
bow held string-down	Assurnasirpal II	king with official
bow held string-down	Assurnasirpal II (BG)	enemies being defeated
turned bow	Assurnasirpal II	king in palm tree ritual
turned bow	Assurnasirpal II	king in pavilion receiving prisoners/tribute
turned bow	Assurnasirpal II	king performs hunting libation
turned bow	Assurnasirpal II	king receiving prisoners/tribute
turned bow	Assurnasirpal II	king with official
turned bow	Assurnasirpal II (BG)	king with official
turned bow	Assurnasirpal II (RO)	king receiving prisoners/tribute
bow pointing down	Shalmaneser III (BG)	king in pavilion receiving prisoners/tribute
no bow	Shalmaneser III (BG)	king in pavilion receiving prisoners/tribute
no bow	Shalmaneser III (BO)	king receiving prisoners/tribute
turned bow	Shalmaneser III (BG)	king receiving prisoners/tribute
turned bow	Shalmaneser III (BO)	king receiving prisoners/tribute
bow pointing down	Tiglath-Pileser III	king with official
bow pointing forward	Tiglath-Pileser III	king receiving prisoners/tribute
no bow	Tiglath-Pileser III	king receiving prisoners/tribute
turned bow	Tiglath-Pileser III	king receiving prisoners/tribute
bow pointing down	Sargon II	king riding in chariot
bow pointing down	Sennacherib	king riding in chariot
turned bow	Sennacherib	king receiving prisoners/tribute
bow pointing down	Assurbanipal (SWP)	king riding in chariot
bow pointing forward	Assurbanipal (NP)	king performs hunting libation
no bow	Assurbanipal (NP)	king receiving prisoners/tribute
no bow	Assurbanipal (SWP)	king receiving prisoners/tribute

Table 1: Chart of turned bow and related motifs. BG: Balawat Gates; BO: Black Obelisk; RO: Rassam Obelisk; SWP: Southwest Palace; NP: North Palace.

3.8. The "heroic overdraw"

Wilkinson has observed that in the Neo-Assyrian Period, depictions of Assyrian archers, particularly the king, show them drawing the bowstring significantly past their ears (with the hand nearly or fully past the back of their hair; see Figure 3.23), [171] which requires enormous physical strength. Wilkinson argued that the the primary function of the "heroic overdraw," as he terms it,[172] is twofold in ancient art: it could serve to ensure that the face of the king or other important person is not obscured by the bowstring (though often that segment of the bowstring would simply be left out[173]), and perhaps more importantly, it served as a propagandistic tool, indicating that the king or other figure performing a heroic overdraw possessed tremendous strength and martial ability.

[171] Wilkinson 1991, p. 91
[172] Wilkinson 1991, p. 91
[173] Wilkinson 1991, p. 93

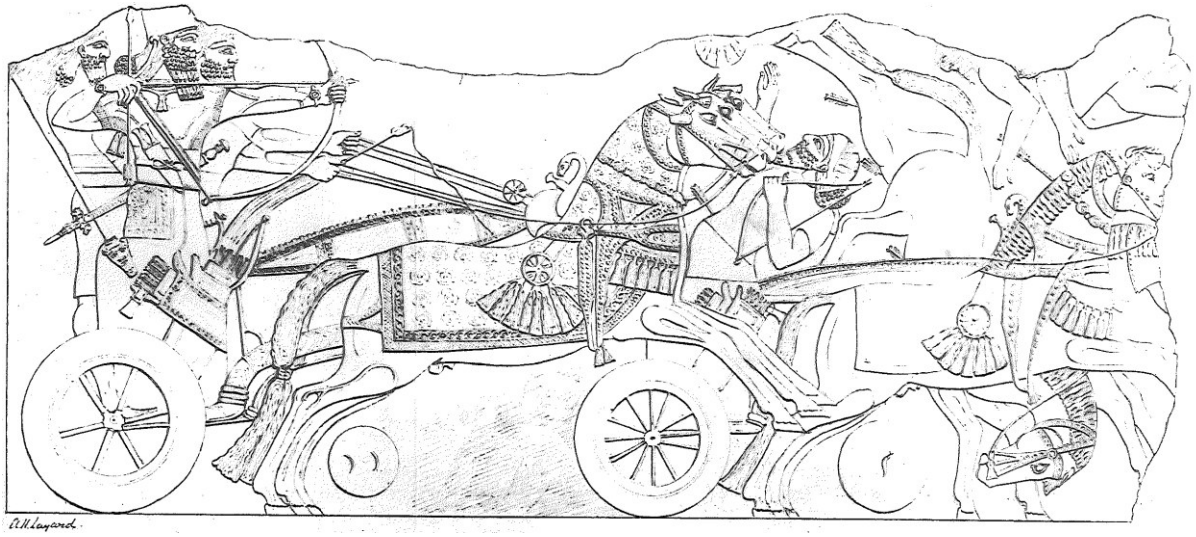

Figure 3.23: Assurnasirpal II performs a heroic overdraw in battle; after Barnett & Falkner 1962, pl. 117.

In the reliefs of Assurnasirpal II, the king is indeed depicted drawing the bow in a "heroic overdraw", with his hand behind or nearly behind his hair (see Figure 3.23 & Figure 4.1),[174] although on Assurnasirpal II 23, he does not appear to draw his bow any farther back than the other Assyrians in the same scene.[175] Other Assyrians generally are shown pulling their bowstrings only slightly past their ears.[176] However, several representation demonstrate that in the reign of Assurnasirpal II, the heroic overdraw, whether intended to emphasize the figure's prowess and strength, or as an artistic convention to depict faces without obscuring them, was not solely for the king, but extended to some other high-status individuals as well. In Assurnasirpal II 24 & 42, what appear to be Assyrian princes (wearing a fillet or diadem[177]) clearly pull their bowstring back in a heroic overdraw (see Figure 4.28),[178] and in Assurnasirpal II 119, a beardless man wearing high-status garments and accompanied by an armored shieldman performs a heroic overdraw (see Figure 3.24).[179]

The Balawat Gates of Shalmaneser III apply the heroic overdraw in an even more egalitarian manner. Shalmaneser III 41 & 74, the king leads two other chariots into battle, and the other two charioteers pull their bows back to just the same degree of heroic overdraw as the king (see Plate 3A).[180] Archers wearing long coats of armor also sometimes pull their bowstrings back behind (or even with) their

[174] Budge 1914, pls. 12 & 14; Barnett & Falkner 1962, pl. 117
[175] Budge 1914, pl. 23
[176] e.g. Budge 1914, pl. 15
[177] Reade 2009, p. 250, identifies those wearing diadems in the reliefs of Assurnasirpal II as the sons of the king.
[178] Budge 1914, pls. 24 & 42
[179] Barnett & Falkner 1962, pl. 119
[180] King 1915, pls. 41 & 74

hair (see Plate 3A),[181] though in other cases they do not (see Plate 3B).[182] Archers without full armor only pull their bowstrings back until their hands are even with their hair.[183] Shalmaneser III 72 shows unarmored cavalrymen and charioteers who all pull their bow strings back past their hair, or nearly so (see Plate 3C).[184] That the heroic overdraw was limited to the king and high-status archers (wearing expensive suits of armor) suggests that the motif was used here to stress the military strength of the Assyrian military elite as a whole rather than solely the king. The scenes showing armored archers performing normal draws all appear on Band XII, depicting campaigns in northern Syria. It is possible that the decorations of Band XII were created by different craftsmen, and they neglected to follow the motif as established in the other bands, however it could have also been deliberately omitted in order to focus attention on the one archer who is performing an unambiguous heroic overdraw (see Plate 3B).[185] In the reliefs of Tiglath-Pileser III, the heroic overdraw is not used at all. The few times the king is depicted shooting a bow, he draws it back no farther than anyone else.[186]

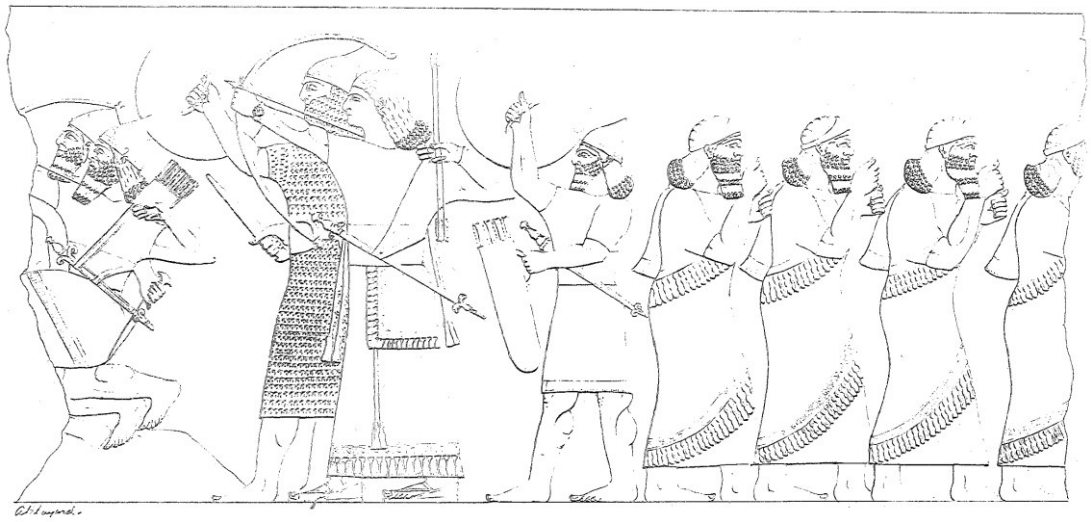

Figure 3.24: A beardless man performs a heroic overdraw, from the reign of Assurnasirpal II; after Barnett & Falkner 1962, pl. 119.

In the sculptures of Sargon II, archers seen from the left began to be shown with their right hand obscured behind their hair (see Figure 3.25).[187] In the only scene of Sargon II drawing a bow, he does not draw it significantly farther back than any other Assyrian (see Figure 3.26).[188] The drawing is not

[181] e.g. King 1915, pls. 20-21, 40, 67-72, 73-77
[182] King 1915, pls. 67-71
[183] King 1915, pl. 7-9, 70-71
[184] King 1915, pl. 72
[185] King 1915, pl. 70
[186] Barnett & Falkner 1962, pls. 11, 39 & 74
[187] e.g. Albenda 1986, pls. 100, 102, 113, 123 & 138
[188] Albenda 1986, pl. 121

quite clear enough to make out precise details, but his hand appears to be at least partly obscured by his hair, just as another Assyrian charioteer.[189]

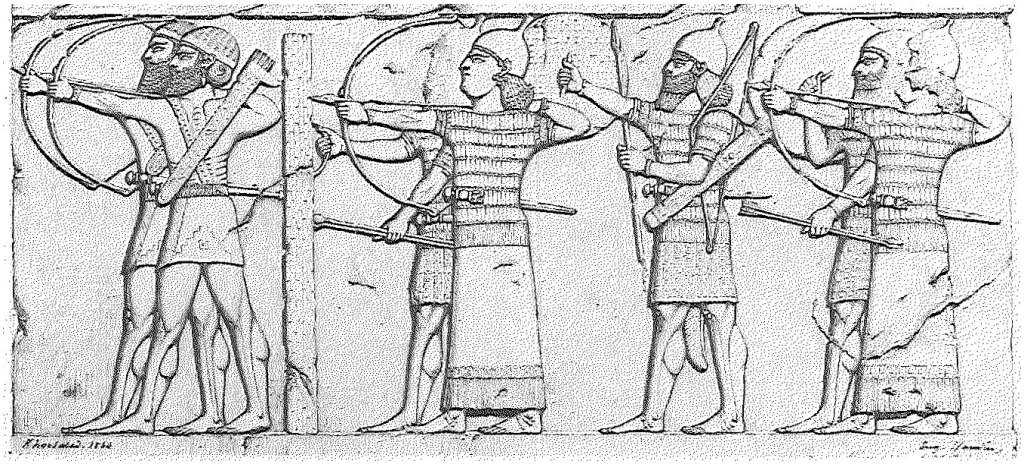

Figure 3.25: Assyrian archers with their drawing hands obscured by their hair; after Albenda 1986, pl. 102.

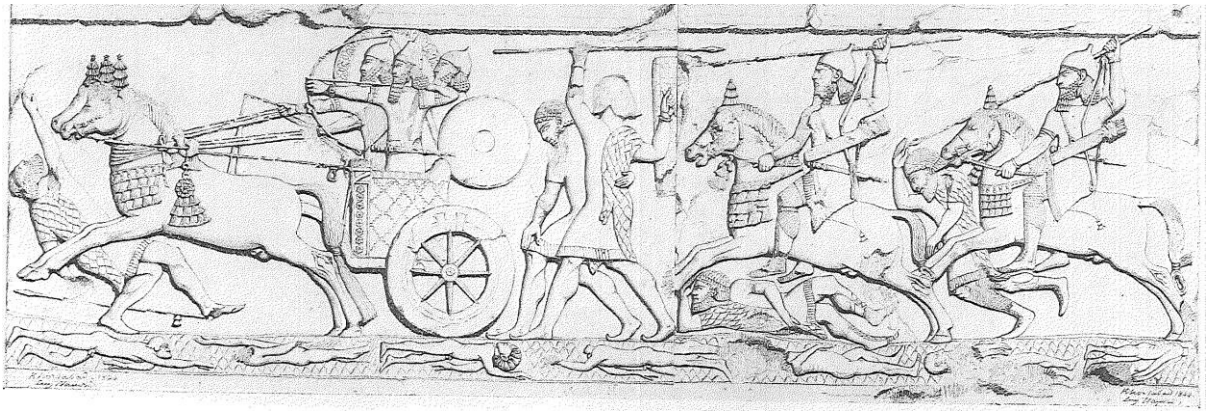

Figure 3.26: Sargon II draws bow with hand obscured by hair; after Albenda 1986, pl. 121.

The right hand obscured behind the hair continued to be depicted in the reign of Sennacherib.[190] There are no depictions of the king drawing a bow in his reliefs, however. It is in the reign of Assurbanipal that the heroic overdraw is most extensively used and most intimately associated with the king. There are numerous depictions of the king pulling the bowstring back past his hair, all of them hunting scenes (see Figure 3.27).[191]

[189] Albenda 1986, pl. 123
[190] Barnett, Bleibtreu & Turner 1998, pls. 42, 55, 68, 152-153, 170
[191] Barnett 1976, pls. 8, 46, 47, 26 & 59

Figure 3.27: Assurbanipal performs a heroic overdraw while hunting; after Barnett 1976, pl. 47.

Thus we find that in the reigns of Assurnasirpal II and Shalmaneser III, the heroic overdraw was used to emphasize the strength and prowess of the Assyrian military, not specifically the king. It then dropped out of use for several generations until the reign of Assurbanipal, where it was used consistently by the king alone. The heroic overdraw seems to have been used primarily as a propagandistic tool, rather than as an artistic convention to ensure that the face of the king is not obscured, as Wilkinson argued.[192] In a number of cases where the heroic overdraw is portrayed, the segment of the bowstring crossing the head of the king is left out, even though it would only cross the top of the head and not the face.[193] Bowstrings are rarely clearly depicted on the Balawat Gates of Shalmaneser III, so it is not possible to determine if this pattern continued in his reign. However, in the reliefs of Assurbanipal, the bowstring is sometimes allowed to cross the very top of the king's head[194], though usually the bowstring is pulled back so far as to clear his head completely. The king's hair and beard were even allowed to be crossed by spear shafts[195] and arrow shafts[196] (see Figure 3.27 and Figure 3.39), which indicates a more naturalistic style of portrayal, but also clearly shows that the heroic overdraw's main purpose is not a stylistic one, but rather to demonstrate the strength and military prowess of the king and, under Assurnasirpal II and Shalmaneser III at least, of the Assyrian military in general.

3.9. Line of sight in Assyrian reliefs

Wilkinson noted that in Egyptian art, when an archer is depicted shooting a bow, the arrow is usually pointing directly at the target,[197] whereas in Mesopotamian art the arrow is generally shown pointing

[192] Wilkinson 1991, p. 93
[193] Budge 1914, pls. 13, 14, 18, 23 & 42
[194] Barnett 1976, pls. 47, 51 and perhaps 59
[195] Barnett 1976, pls. 12 & 46
[196] Barnett 1976, pls. 46 & 47
[197] Wilkinson 1991, pp. 93-94

somewhat above the target until the later Neo-Assyrian Period (with all relevant examples coming from the reliefs of Assurbanipal's North Palace), when direct aim is also attested.[198] Aiming high is more realistic, since the arrow drops as it flies, and the archer must counteract that by raising his aim above his intended mark – the farther away the target is, the higher the archer must fire to achieve the necessary range.

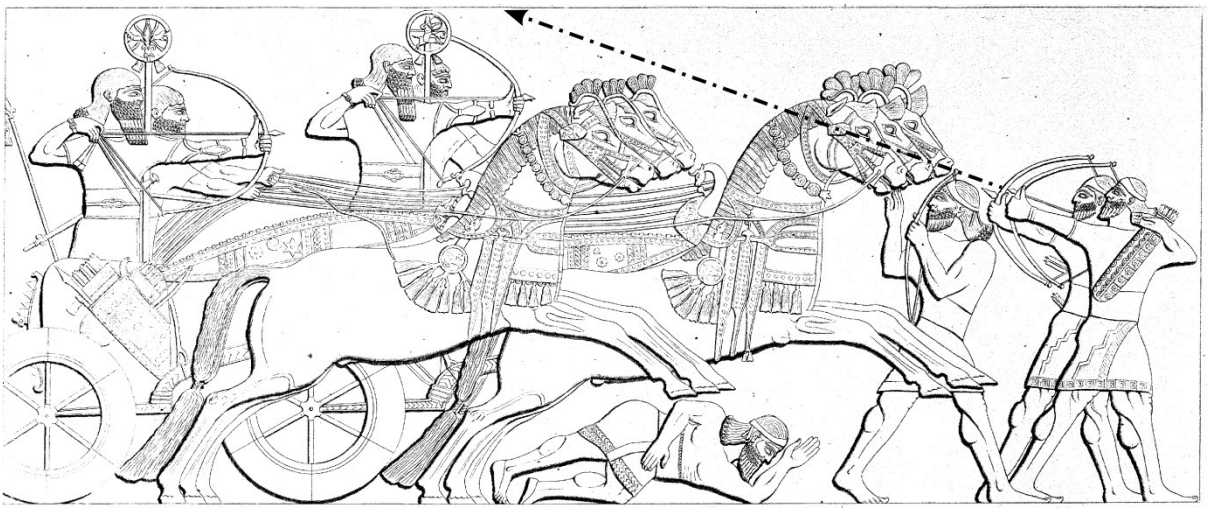

Figure 3.28: Enemies firing high towards chariots (dashed line added to indicate direction of aim), from the reliefs of Assurnasirpal II; after Layard 1983a, pl. 27 (drawing of Budge 1914, pl. 14).

A review of Assyrian reliefs reveals a somewhat more complex view of the use of high and direct aim throughout the Neo-Assyrian Period (see Appendix F for a summary chart). Even in the reliefs of Assurnasirpal II, the case is far from clear-cut. Indeed, most battle scenes show the arrows of archers pointing directly at their targets, sometimes angled up or down if the target is above or below the archer, (e.g. Figure 4.15 & Figure 4.28),[199] and in one case, even pointing below the target.[200] Charioteers and mounted archers are usually depicted with their arrows perfectly horizontal, while their enemies are below them (see Figure 4.22).[201] Enemy foot soldiers do appear to aim above their targets when firing at Assyrian chariots (see Figure 3.28),[202] however if their targets are the horses pulling the chariots rather than the chariot crew, then their arrows do indeed point directly at their intended target. The only certain example of aiming high is the lion hunting scene cited by Wilkinson,[203] where the king aims just above the head of a lion that is attacking his chariot (see Figure 4.1).

[198] Wilkinson 1991, pp. 94-96
[199] e.g. Budge 1914, pls. 13 & 24
[200] Budge 1914, pl. 13
[201] e.g. Budge 1914, pls. 14, 15, 17, 18, 24 & 42
[202] Budge 1914, pls. 14 & 15
[203] Budge 1914, pl. 12

The gates of the palace of Assurnasirpal II at Balawat exhibit a more general mixture of high and direct aim, often emplying both styles in similar contexts. Archers on foot and in chariots generally aim horizontally or nearly so,[204] however in Assurnasirpal II BG 9, the king in his chariot and the charioteer following him fire distinctly upwards, though another charioteer from the same band fires horizontally (see Figure 3.29).[205] There are also several cases where archers fire downwards directly at targets lower then them, such as an enemy firing from a city wall at an attacking Assyrian, the king firing down from his chariot at a bull, or an Assyrian firing at a crouching lion.[206] The Mamu Temple gates at Balawat also show a similar mixture of chariotry, cavalry, and foot archers firing horizontally[207] or aiming high,[208] often in the same scene. For example, in a battle scene against Bīt-Adini, charioteers and foot soldiers approaching the battle all fire horizontally, while the foot soldiers at the base of the city walls aim upwards, directly at their opponents on the city wall (see Figure 3.30).[209] Assurnasirpal II BG 85 reverses the aiming styles: the foot soldiers to the left of the city walls (as well as the enemy upon them) fire horizontally as does the king approaching in his chariot, while the foot soldiers to the right of the city wall and the approaching cavalrymen on the left fire high (see Figure 3.31).[210]

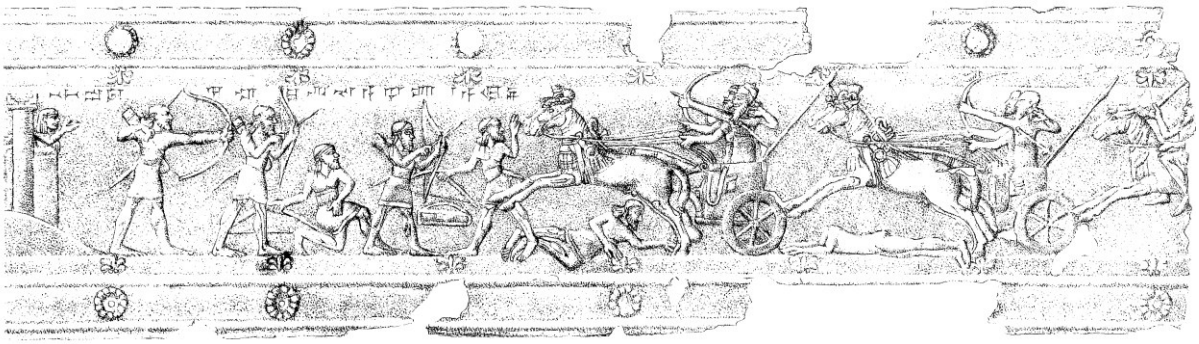

Figure 3.29: Assurnasirpal II and another charioteer aim high while a foot soldier aims horizontally, from the gates of the palace of Assurnasirpal II at Balawat; after Curtis & Tallis 2008, fig. 10 (drawing of fig. 9).

[204] e.g. Curtis & Tallis 2008, figs. 9, 11,
[205] Curtis & Tallis 2008, fig. 9; aiming high may also appear in a less pronounced form in figs. 15, 25 & 27.
[206] Curtis & Tallis 2008, figs. 11, 13 and 15 & 31, respectively.
[207] Curtis & Tallis 2008, figs. 69, 75
[208] Curtis & Tallis 2008, figs. 59, 69, 75
[209] Curtis & Tallis 2008, fig. 75
[210] Curtis & Tallis 2008, fig. 85

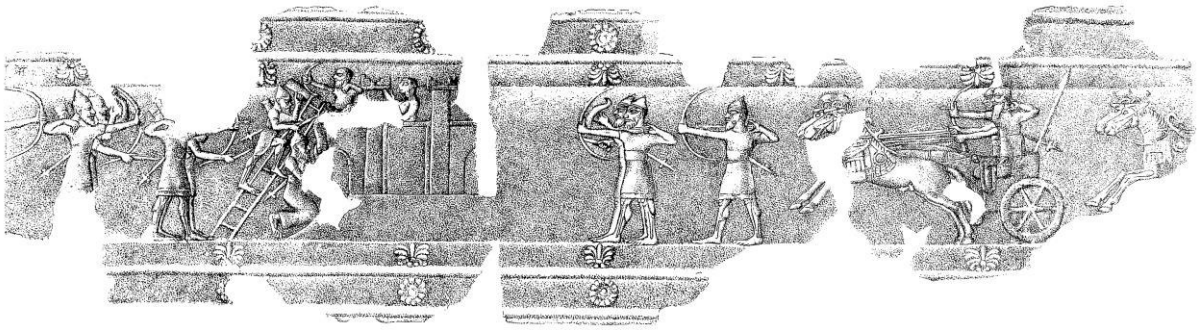

Figure 3.30: Foot soldiers (including the king) fire directly up at opponents on far left, while others and charioteers approaching from right fire horizontally, from the gates of the Temple of Mamu at Balawat; after Curtis & Tallis 2008, fig. 76 (drawing of fig. 75).

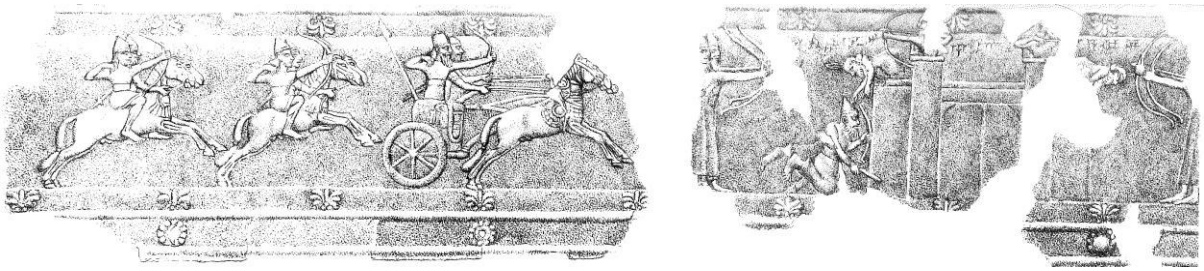

Figure 3.31: King in chariot, archers to left of city and enemy in the ramparts fire horizontally, while archers to the right of the city and the cavalrymen coming from the left aim high, from the gates of the Temple of Mamu at Balawat; after Curtis & Tallis 2008, fig. 86 (drawing of fig. 85).

The Balawat Gates of Shalmaneser III also exhibit a similar mixture of high and direct aim, sometimes in the same scene. In battle scenes, archers on both sides typically aim directly at each other,[211] though in at least one case, enemy archers are shown aiming distinctly high over their Assyrian attackers.[212] Lines of archers who are more distant from the battle often aim slightly upwards with no clear target,[213] doubtless indicating that they were firing at greater range. Sometimes, however, their upwards aim intersects the ramparts of an enemy city,[214] and thus can be considered to be direct aim at a target. Lines of archers are also sometimes shown firing horizontally.[215] Like the reliefs of Assurnasirpal II, charioteers and cavalry are normally shown firing horizontally,[216] though there are several cases where they fire distinctly upwards.[217] While scenes of close battle (where the combatants are in more or less direct contact with each other) direct fire tends to prevail, archers who are more visually distant from the battle tend to exhibit a mixture of high and direct aiming.

[211] King 1915, pls. 3, 9, 44 & 50
[212] King 1915, pl. 9
[213] King 1915, pls. 43, 44, 50-52, 69, 70, 71
[214] King 1915, pls. 21, 73 & 75-77
[215] King 1915, pls. 2, 8, 40, 52, 53, 67-70 & 74
[216] King 1915, pls. 41, 42, 45-49, 52, 53, 68, 72, 74 & 76
[217] King 1915, pls. 38, 66, 69, 70 & 71

The reliefs of Tiglath-Pileser III also have a mixture of aiming styles. Similar to the Balawat Gates, enemies are often shown shooting directly at Assyrians.[218] In the majority of scenes of cities being attacked, the arrows of the Assyrians are pointed directly at the city. Due to the relative scale or position of the various figures, the arrows could be horizontal to the ground (e.g. Figure 4.30),[219] or sometimes they are angled slightly upwards to point at the ramparts (see Figure 3.32).[220] Some scenes show Assyrians in siege engines firing directly at the city being attacked – their arrows are held horizontally, though because their whole bodies are at an angle due to the slope that the siege engine rests upon, the arrows are actually pointing upward.[221] In Tiglath-Pileser III 35 & 41, Assyrian archers engaged in a melee aim noticeably upwards.[222] In addition, Tiglath-Pileser III 15 depicts a charioteer (the king) firing a bow has the arrow horizontal to the ground (see Figure 4.17),[223] just as in earlier depictions.

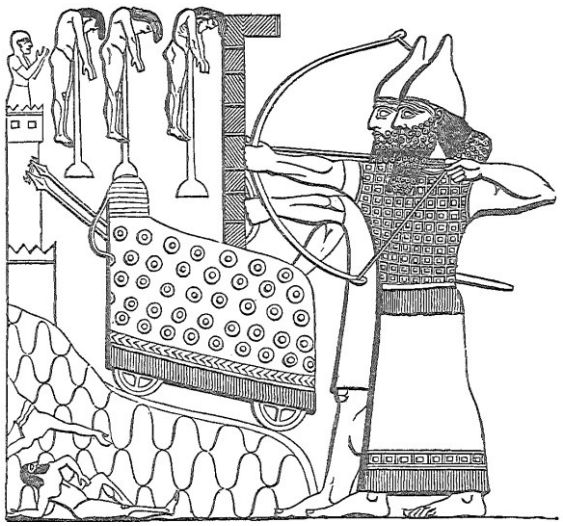

Figure 3.32: An armored archer from the reliefs of Tiglath-Pileser III aims very slightly upwards while attacking a city; after Barnett & Falkner 1962, p. 15, fig. 4.

The reliefs of Sargon II follow much the same pattern. Enemies often shoot directly at Assyrians,[224] though they also sometimes shoot just over the heads of the Assyrians.[225] Assyrians attacking cities aim their bows directly at the city or the defenders on the ramparts, whether that means their arrows are angled upwards[226] or horizontal to the ground (see Figure 4.31).[227] There is nevertheless at least one case where an Assyrian archer aims high (so a straight line from his arrow passes out of the upper

[218] Barnett & Falkner 1962, pls. 10 & 33
[219] Barnett & Falkner 1962, pls. 10, 11, 31, as well as pl. 62, where the archer is positioned above the normal ground level so that his horizontal arrow intersects the city ramparts.
[220] Barnett & Falkner, pls. 39, 72, and possibly 52, 54 & 73-77
[221] Barnett & Falkner 1962, pls. 31 & 33
[222] Barnett & Falkner 1962, pls. 35 & 41
[223] Barnett & Falkner 1962, pl. 15
[224] Albenda 1986, pls. 96 & 138
[225] Albenda 1986, pls. 98 & 101
[226] Albenda 1986, pls. 94, 98, 101, 107, 112, 124, 128, 136, 138 and possibly 102
[227] Albenda 1986, pls. 94, 100, 101, 107, 112, 118, 119, 124, 128, 136 and possibly 96

boundary of the scene without intersecting any target, see Figure 3.33).[228] Like earlier depictions, charioteers normally fire their arrows more or less horizontal to the ground (see Figure 4.18),[229] however there are several exceptions, where they clearly are aiming upwards and not directly at a visible target (see Figure 3.34).[230]

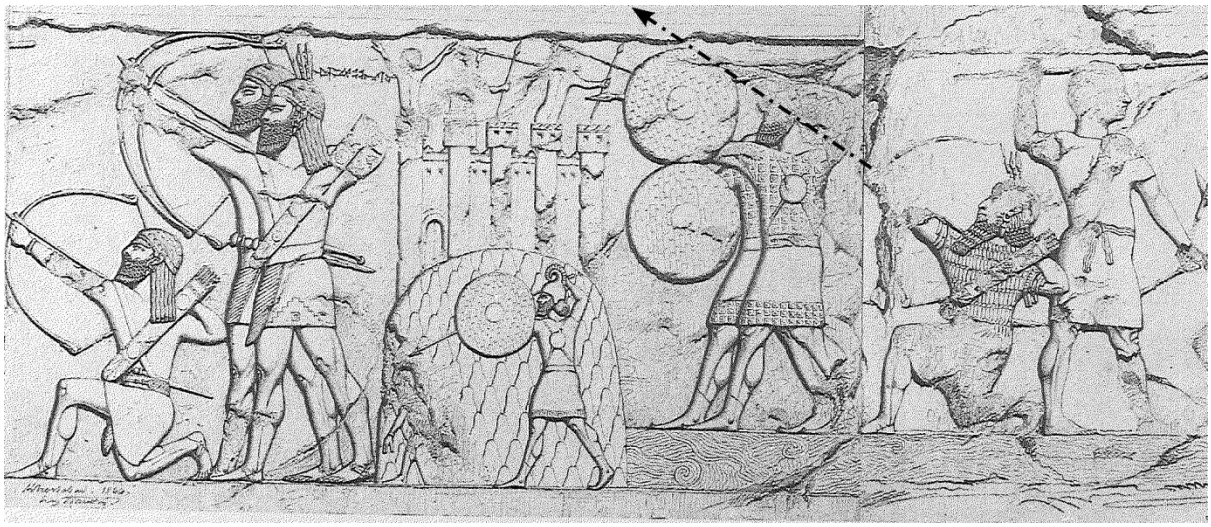

Figure 3.33: An archer on the reliefs of Sargon II aiming high while attacking a city (dashed line added to indicate direction of aim). The "auxiliary" archers on the left also aim high above another city (visible on the next orthostat, see Figure 4.31); after Albenda 1986, pl. 95.

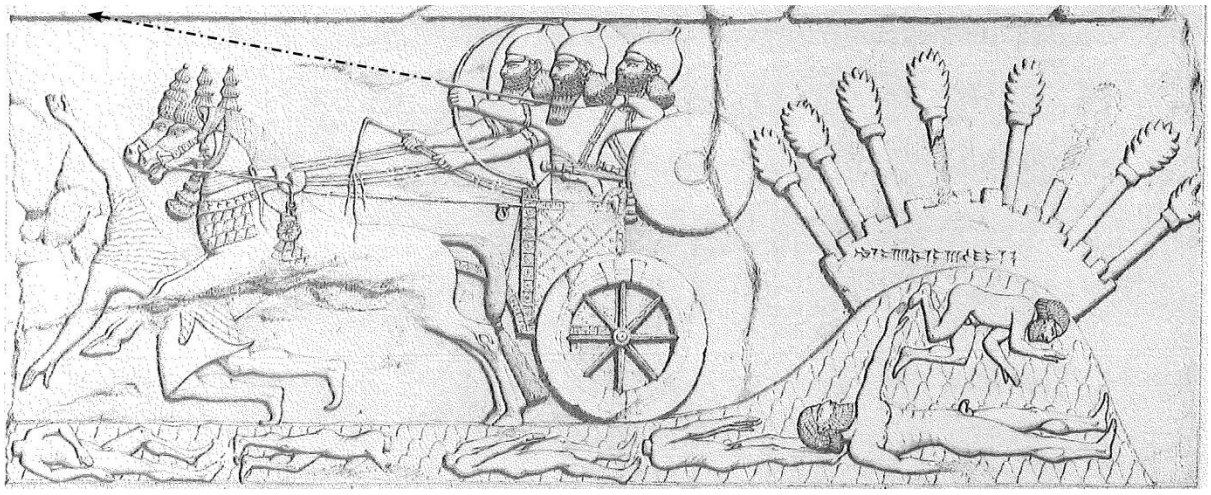

Figure 3.34: A charioteer aiming high (dashed line added to indicate direction of aim), from the reliefs of Sargon II; after Albenda 1986, pl. 123.

Sennacherib's reliefs continue the mix of direct and high aiming, however there is a distinct prevalence of direct aim. The majority of scenes with archery show Assyrians shooting arrows

[228] Albenda 1986, pl. 95
[229] Albenda 1986, pls. 113, 116, 117, 121 and possibly 122
[230] Albenda 1986, pls. 97 & 123

directly up at enemies on city ramparts (see Figure 3.35),[231] though there are still several cases where archers (usually those more visually distant from the city under attack) fire their arrows in a line that goes over the top of the city[232] (and thus more realistically represents an archer's attempt to give his arrow the altitude necessary to reach the top of a city wall, see Figure 4.33). Enemies also generally aim directly at their Assyrian attackers,[233] though there are exceptions to this as well, where the enemy shoots over the heads of the Assyrians (see Figure 3.36).[234] In melees, both Assyrians and their enemies tend to aim directly at each other, whether on foot or on horseback (see Figure 4.26).[235] Sennacherib 29 has a charioteer firing a bow with the arrow horizontal in the style typical in earlier reliefs.[236] Thus, the difference between the reliefs of Sennacherib and his predecessors is more one of quantity than of quality.

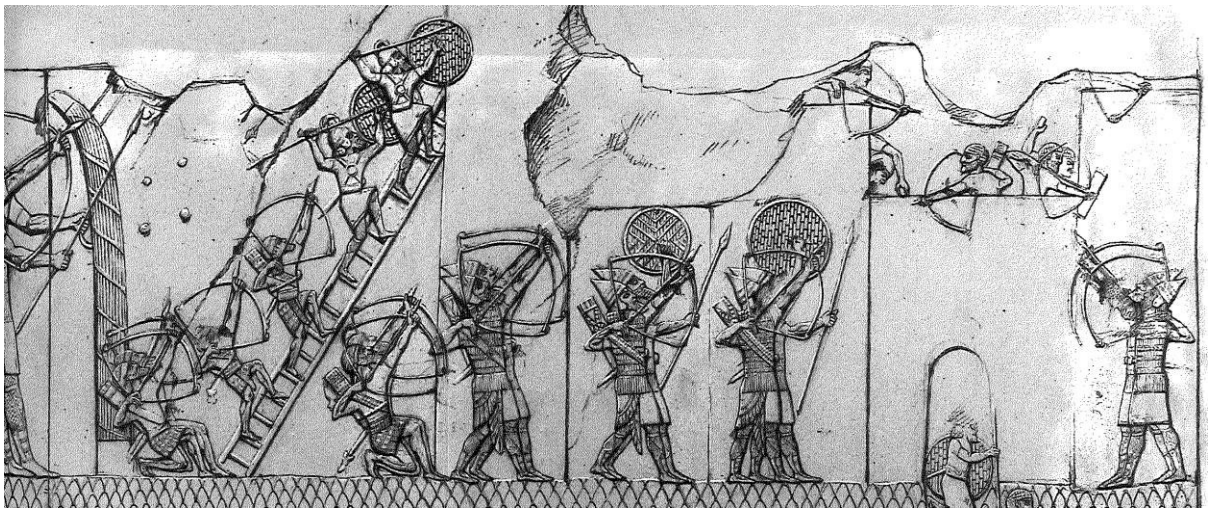

Figure 3.35: Assyrian and enemy archers aim directly at each other, from the reliefs of Sennacherib; after Barnett, Bleibtreu & Turner 1998, pl. 271.

[231] Barnett, Bleibtreu & Turner 1998, pls. 64, 71, 72, 152, 158, 166, 168, 170, 172, 270, 272, 328, 330, 332, 359, 374, 375, 381, 471, 502 and possibly 27, 36, 42, 48, 68, 283 & 457. Some aim their bows horizontally at the city walls in general, rather than directly at the people on the ramparts: Barnett, Bleibtreu & Turner 1998, pls. 87, 89 & 94

[232] Barnett, Bleibtreu & Turner 1998, pls. 55, 269, 324 and possibly 275.

[233] Barnett, Bleibtreu & Turner 1998, pls. 55, 66, 86, 88, 89, 168, 236, 270, 272, 454 and possibly 137

[234] Barnett, Bleibtreu & Turner 1998, pls. 87, 92-94, 130, 328 & 330

[235] Barnett, Bleibtreu & Turner 1998, pls. 88, 89, 130, 382, 454 and possibly 28 & 92

[236] Barnett, Bleibtreu & Turner 1998, pl. 29 – unfortunately, the target is not visible due to the fragmentary condition of the relief.

Figure 3.36: Enemy archers aim over the heads of Assyrian cavalry (dashed lines added to indicate direction of aim). The archers on the right could conceivably be aiming at the middle cavalryman; after Barnett, Bleibtreu & Turner 1998, pl. 92.

The battle scenes in Assurbanipal's reliefs from the Southwest Palace generally have Assyrians and their enemies aiming directly at each other, or aiming horizontally at a city (see Figure 4.35).[237] In the North Palace reliefs, however, Wilkinson observed that when the king is firing at a distant target, he clearly aims high,[238] but when shooting at close range, he aims directly at a vital part of his target.[239] Indeed, there are two scenes where the king first directly at the head of a lion that is pouncing upon him, clearly at very close range,[240] and another where he appears to be aiming at the back, rather than head, of one of a pair of lions chasing his chariot.[241]

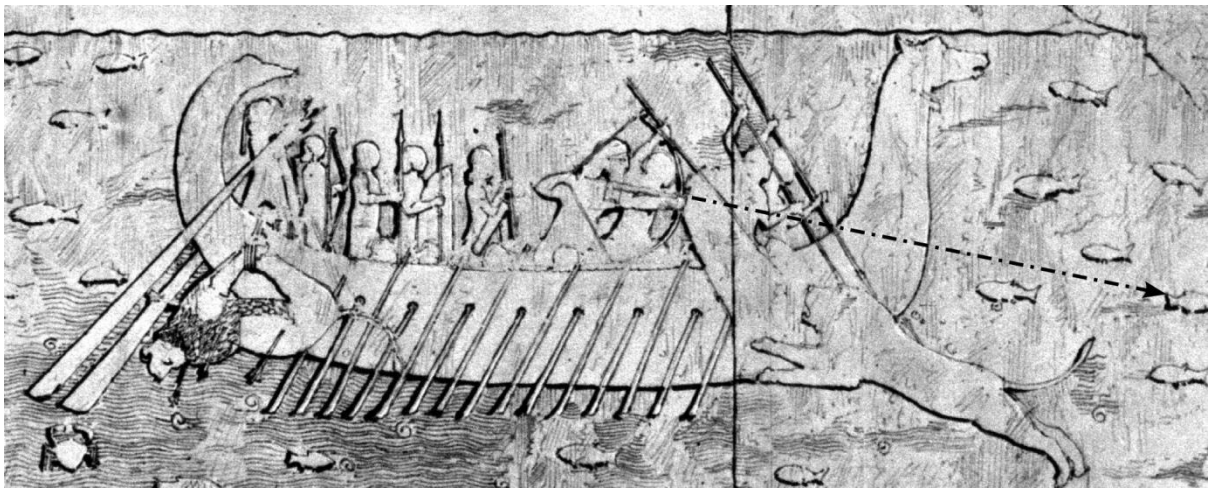

Figure 3.37: Assurbanipal aims high at a lion while on a boat in the Tigris (dashed line added to indicate direction of aim); after Barnett 1976, pl. 54.

[237] Barnett, Bleibtreu & Turner 1998, pls. 206, 288, 292 & 296
[238] see Barnett 1976, pl. 8
[239] Wilkinson 1991, p. 96 & Barnett 1976, pl. 56
[240] Barnett 1976, pl.56 – on foot in the upper register and in a chariot in the lower register
[241] Barnett 1976, pl. 56 – upper register on the left

However, in a similar apparently close-range scene (a lion leaping from the Tigris to attack a boat carrying the king), the king clearly aims over the lion's head (see Figure 3.37).[242] It could have been intended to indicate that the lion was farther away from the boat, however the lion is clearly pouncing, which would only be done at very close range. Equally ambiguous Assuranipal NP 47 & 51, where the king, mounted on horseback, hunts a herd of wild horses, and a straight line from his arrow intersects the neck of a horse that is some distance away (see Figure 3.38).[243] Thus, direct aim could not have been intended solely for close-range scenarios.

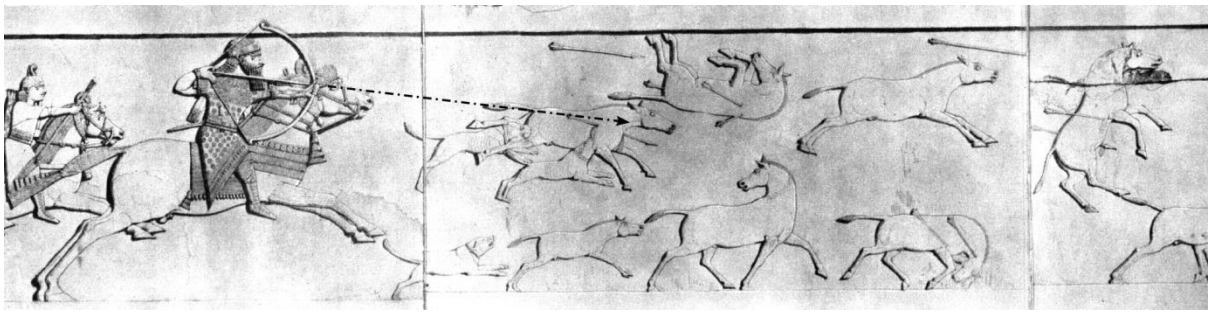

Figure 3.38: Assurbanipal aims directly at the neck of a wild horse (dashed line added to indicate direction of aim); after Barnett 1976, pl. 47.

Indeed, the most striking feature of Assurbanipal's reliefs in relation to archery is its clear and elegant depictions of long-range, indirect archery. In the long-range scene mentioned by Wilkinson, Assurbanipal does indeed aim slightly upward to shoot at a distant lion.[244] What is more, there is a second arrow already in flight half way between the king and the lion, perfectly horizontal and, most importantly, above the level of the arrow still on the string of the bow, and the target lion already has several arrows projecting from his neck and back. If one traces a line from the arrow on the string to the arrow in flight to the arrows in the lion's back, it very nicely forms just the sort of shallow arc that an arrow would make in flight (see Plate 4A). The artist was not content for the audience to understand the long-range flight of the arrow from the upward angle it was fired at, but instead traced out its flight path, which is unprecedented in Neo-Assyrian art.

The multiple arrows could have been intended to emphasize the king's'prowess by showing that he could fire a second before the first arrow struck its target, however it is more likely that the arrows all represented a single arrow in the various stages of its flight. The reliefs of Assurbanipal contain several examples of the "continuous style," where a single person or creature is represented multiple

[242] Barnett 1976, pl. 54
[243] Barnett 1976, pls. 47 & 51
[244] Barnett 1976, pl. 8; a similar scene may have also existed in the damaged top register of pl. 51

times to illustrate the action it was performing.[245] In Assurbanipal's lion hunt scene, for example, the lion is shown being released from its cage, rushing forward, and leaping at the king.[246] All three depictions are in the same composition, yet they are intended to represent different stages of an action taking place within that composition. The use of multiple arrows to trace out a trajectory is thus another aspect of the continuous style.

A further hunting scene traces out the trajectory of the king's arrow, and in an even more pronounced fashion (see Figure 3.39).[247] The king crouches in a pit and, with arrow angled significantly upwards, he fires up at gazelle (represented, in continuous style, by three gazelles: one striding, one running away, one lying dead[248]). An arrow flies horizontally near the top of the register, and a third arrow pierces the back of a running gazelle. A line drawn from the arrow on the string to its apex at the arrow in flight and then to the gazelle's back maps out a rather steeper trajectory than that in the lion hunting scene,[249] which is precisely what one would expect when shooting from a low area to a target on a higher area (see Fig. 2.6). No doubt, this was intended to be an even more impressive display of the king's prowess, as shooting indirectly at a moving target on a higher level is one of the more challenging situations an archer could encounter.

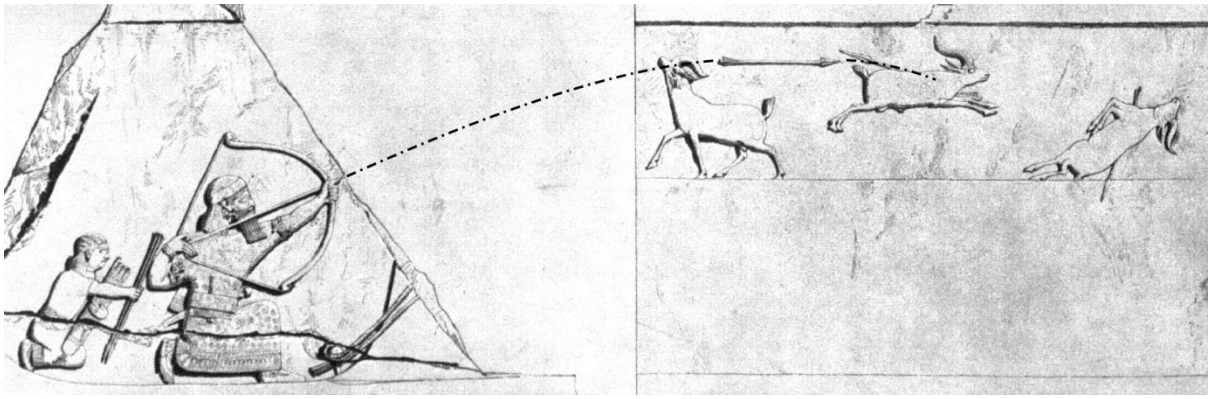

Figure 3.39: Assurbanipal firing at a distant gazelle from a pit, with dashed line added showing the trajectory traced by the arrows, after Barnett 1976, pl. 46.

Neo-Assyrian reliefs, therefore, have exhibited a mixture of line-of-sight and high aiming by archers from even as early as Assurnasirpal II. While in one hunting scene, Assurnasirpal II did aim high at a rearing lion, Assurbanipal does indeed almost always aim directly at the head of rearing lions in his hunting scenes. Nevertheless, the rest of Assyrian reliefs throughout the period show such a mixture

[245] Watanabe 2004, p. 103; also referred to as the *"kinematographische Erzählungsform*" (Unger 1933) and "strip-cartoon effect" (Reade 1979a, pp. 106-107).
[246] Watanabe 2004, p. 104, fig. 1
[247] Barnett 1976, pl. 46
[248] Watanabe 2004, p. 104, fig. 2
[249] A fourth arrow may have also existed in the break between the king and the gazelle. It would have been climbing towards the apex of the trajectory, which is represented by the horizontal arrow.

of the two aiming styles that the motif appears to be almost random, perhaps, in some cases at least, dictated merely by the whim of the artist in charge of that particular scene. The supposition that enemies were portrayed shooting over the heads of the Assyrians to make them appear to be weak in the face of Assyrian might may indeed be valid for those scenes in which they do aim high,[250] however, the vast majority of examples, spanning the entire period, show enemies firing directly at their Assyrian attackers. This, then, could be taken as an emphasis of Assyrian strength and valor – persevering in attack even in the face of stiff resistance - rather than of the weakness of their enemies. Charioteers and cavalrymen are nearly always shown in what must have been a stylized form, with their arrows horizontal to the ground, regardless of the circumstances of the combat around them. They continue to be stylized like this in reliefs from Assurnasirpal II through Assurbanipal. Finally, quite apart from introducing the motif of direct aim into Assyrian art, the reliefs of Assurbanipal can be seen as the crowning Assyrian achievement in depicting indirect fire, with two (perhaps even three) scenes which clearly mark out the trajectory of an indirectly-fired arrow.

3.10. Conclusions

Iconography is inherently interpretative in nature. Each depiction was created by an artist (or groups of artists for large compositions such as palace reliefs) and each creation was intended to convey a message. The images recorded in the iconography present the world not necessarily as the artist saw it, but how the artist wished it to be seen (to the extent of the artist's abilities). Depictions of archery, therefore, show the role that archery played in the culture and worldview of the artist (or of those who commissioned the artwork).

This is perhaps most noteworthy in official monuments commissioned by the king, as official iconography and inscriptions generally possessed a strong and consistent ideological message. While it may not be appropriate to call these monuments "public," given that some of them (such as those in temples) would not have been accessible to the majority of the population, the ideologically-laden nature of the iconography surely was intended to pass its message to an audience which, in most cases was likely members of the Assyrian ruling class itself (see §3.1). They would have generally had access to the areas where the monuments were displayed, and the official ideology, with its focus on the king, seems intended to both foster a strong sense of group identity by depicting victories in which the members of the ruling class shared, but also to ensure their subordination to the king by stressing the legitimacy of his rule.

[250] Wilkinson 1991, p. 97

Official iconography and royal inscriptions tend to have very consistent visual and textual themes (though these themes did change over time).[251] For example, certain gestures or compositional elements are found on both palace reliefs and bronze gate bands, such as Assurnasirpal II holding a turned bow while receiving prisoners on both his reliefs and gate bands from Balawat (see §3.7), as well as the chariot hunting scene from the wall paintings at Til Barsip (and perhaps dating to Tiglath-Pileser III; see Figure 4.2), which is very similar to those from the reliefs (see Figure 4.1), White Obelisk,[252]and Balawat Gates (see Figure 4.8) of Assurnasirpal II. Royal inscriptions and other official texts are also replete with set phrases which are frequently repeated with little or no variation (e.g. in the curse sections of treaties; see §3.4), and they often employ themes similar to those found on official iconography (e.g. the king receiving his mandate from the gods in the form of a bow (see §3.5), or the king as a fearless hunter of dangerous creatures; see §4.1). The uniformity of these motifs across a variety of media results from their composition by a central authority, desirous of expressing a coherent ideological message in a variety of contexts.

The bow played a number of symbolic roles in official sources: asserting the manly valor and prowess of the king (or occasionally other Assyrians), symbolizing the possession or loss of military power, and the representing the mandate of the gods. Most succinctly, the bow symbolized power, a role it doubtless derived from its position as a preeminent weapon of war (see §4).

While large, "public" displays of official iconography tend to all share similar imagery, official seals (those used by the king or officials acting in his name) sometimes contain substantially different themes.[253] Some seals used by officials seem to deliberately duplicate themes found in official iconography, such as several seals of high officials depicting the "tree of life" flanked by the king, officials or genii[254], imitating similar scenes found on palace reliefs.[255] However, one of the most common official seal types - the "lion combat",[256] where the king stabs a rampant lion - is well-attested on official seals, yet rare on other media (see §4.1). The small area available to the seal-cutter precluded the use of any extended imagery, therefore the iconography, along with the message it was to convey, had to be compressed or simplified. The differing iconography may also reflect a difference in audience or usage. Official seals were used both to authenticate official correspondence[257] and to seal objects (such as containers of goods or folding writing boards) to

[251] A certain amount of minor stylistic variation in the reliefs (or bronze door bands) of individual structures can be attributed to the multiplicity of craftsmen involved in creating these monuments; see Schachner 2007, p. 77.
[252] Sollberger 1974, pls. 44-45 (bottom register of each plate)
[253] Collon 1987, p. 75
[254] Winter 2009a, pp. 126-129
[255] e.g. Budge 1914, pls. 11 & 42
[256] Winter 2009a, pp. 114-115
[257] e.g. SAA XV 125, where and official writes to the king to complain that an order he received appeard to have been sealed with a false seal, as it does not resemble the impression of other official seals he had received.

prevent them from being opened without permission.[258] Thus, official seals served a specific, practical role, and the audience for sealings was considerably more resitricted that public displays such as palace reliefs or stelae. Therein may lie the principle reason for this difference in symbolic content. While public monuments were intended to emphasize the might and legitimacy of the king, official bureau seals (used by officials rather than the king himself[259]), were an organizational tool, and as such they stressed the importance of the order of the state of which they were an integral part. The "lion combat" represents the triumph of order, symbolized by the king, over chaos, symbolized by the lion (see §4.1). The iconography of the lion combat seals, therefore, stresses that order is derived from the king, which implicitly asserts the legitimacy and importance of sealings made in the name of the king as to violate such seals would not only be disobedience to the king, but a rejection of the order that the king stands for.

Private iconography, principally attested on seals, does not represent a centralized ideology as official sources do, yet the symbolic role the bow played on private seals also tends to be fairly consistent. Some private seals depict devotional scenes, where a supplicant holding a libation bowl (and sometimes a turned bow) stands before an altar (see §3.7), very reminiscent of devotional scenes on palace reliefs (see Figure 3.20).[260] Parker explains this similarity by suggesting that these may have been seals of courtiers, with the depictions showing them making libations for the life of the king.[261] However, by far the most common use of archery imagery on private seals are in hunting scenes involving a single standing or kneeling archer (see §4.1). In some cases, these hunting scenes appear to be mythological in nature (as hunter, prey, or both may be mythological creatures), however in others, the hunter may well be intended to represent the seal-owner himself. Private iconography, therefore, forgoes the themes of royal power and legitimacy which official iconography focuses on. Instead, it emphasizes themes more directly relevant to the individuals who owned the seals, such as private religious practices or beliefs, or hunting either as a symbol of strength and prowess or as a representation of a common activity.

Ivories are perhaps the most difficult of all sources to interpret. Their age is often very uncertain (as they may have been very old objects already at the time of their deposition[262]), as is their origin (whether made by Assyrian or non-Assyrian craftsmen, and if the latter, if made in Assyria using Assyrian motifs or made elsewhere[263]). The intended audience of the iconography is also unclear.

[258] Radner 2008, pp. 482-483
[259] Winter 2009a, p. 116
[260] Winter noted that the scenes on seals are often the reverse of those in reliefs and conjectured that the seal-cutters may have used the reliefs themselves as a prototype, copying them directly onto the surface of the seal; Winter 2009a, p. 125.
[261] Parker 1962, p. 35 (ND 6083)
[262] Herrmann 2009, p. 12
[263] Herrmann & Laidlaw 2009, pp. 2, 14, 56-57, 76, 108-111

Some of the objects the ivories decorated may have been effectively public monuments (such as panels which may have decorated thrones[264]). Because of these uncertainties, it is difficult to discuss ivories in a categorical manner given that so many different factors could be involved in each individual piece. In the case of BM 127065,[265] the depiction of the king holding a turned bow while conversing with an official is so similar to those found on reliefs[266] that it may have been copied from a relief, much as the seals depicting the "tree of life" (see above).

The symbolic use of archery changed over the course of the Neo-Assyrian Period. In the reigns of Assurnasirpal II and his son, Shalmaneser III, archery-related imagery was used in a fairly consistent manner. The king often holds a bow and two arrows, normally holds a turned bow when receiving prisoners or submission, and regularly performs heroic overdraws (along with a number of other high-status Assyrians). By the reign of Tiglath-Pileser III, roughly 80 years after the death of Shalmaneser III, the uses of these motifs had become less consistent. The bow with two arrows and turned bow are both still present, but used less frequently and in a less consistent manner, and the heroic overdraw is entirely absent.

The reliefs of Sargon II exhibit marked changes in archery-related iconography. Sargon II seized the throne in a rebellion against Shalmaneser V, and he appears to have suffered from questions about the legitimacy of his kingship: unusually for an Assyrian king, he rarely mentions his parentage (and may have been of common birth, though in a single inscription he calls himself a son of Tiglath-Pileser III), and his throne name of Šarru-kēnu means "legitimate king."[267] Not only did he build himself a new palace, he built an entirely new capital city (Dūr-Šarrukīn, modern Khorsabad) to distance himself from the former capital of Nimrud and its power structure, which had supported the king who he had overthrown. To decorate his new city, he established different icionographic conventions to further distinguish him from his predecessors. Sargon II never holds a bow with two arrows (though one attendant does), nor does he hold the conventional turned bow, instead invariably holding his bow pointing downward. All Assyrians, not only high-status ones, are shown performing heroic overdraws. The inclusion of all Assyrians may have been intended to help foster a sense of unity and shared accomplishment among his supporters, as he has himself seen a revolution by disaffected subjects topple a king.

[264] Mallowan & Davies 1970, p. 2; Herrmann & Laidlaw 2009, p. 31
[265] Herrmann & Laidlaw 2009, p. 230, pl. 125 (BM 127065)
[266] e.g. Barnett & Falkner 1962, pl. 84
[267] Grayson 1992, pp. 87-88

Sennacherib largely continued the conventions established by his father, with only a single depiction of the king holding a bow with two arrows, and holding his bow pointing downward (though there is a single exception where we holds a turned bow[268]). All Assyrians perform heroic overdraws.
The official texts of Sennacherib, Esarhaddon, and Assurbanipal, however, make more extensive use of archery imagery than before, both as a symbol of military power (both theirs and that of opponents) and as a sign of their royal mandate from the gods. While Assurbanipal's textual themes resemble those of his father and grandfather, his iconography exhibits significant differences. Like his grandfather, there is a single example of him holding a bow with two arrows. The turned bow motif is not employed, instead the king holds a forward or downward pointing bow or no bow at all. The most marked difference, however, is that in the reliefs of Assurbanipal, the king alone performs heroic overdraws.

Archery iconography, therefore, can be divided into three rough periods. In the reigns of Assurnasirpal II and Shalmaneser III, archery iconography was fairly consistent, focusing largely on the king and other elite Assyrians, though these motifs become less consistent by the reign of Tiglath-Pileser III. The second phase begins with Sargon II, who instituted significant changes and extended the heroic overdraw to all Assyrians, a pattern which largely continued under Sennacherib. The reign of Assurbanipal marks the final stage, where the heroic focus of the iconography is the king alone.

[268] Barnett, Bleibtreu & Turner 1998, pl. 342

4. Archery in Practice

4.1. Hunting

Hunting occupied a significant place in royal ideology and iconography. In the royal hunt, the quarry was typically lions or wild bulls (the hunting of which may have been the exclusive right of the king),[1] both powerful and dangerous animals. The image of the king as a skilled and daring hunter, using bow, spear, and even sword, was strongly emphasized both in textual and iconographic sources.

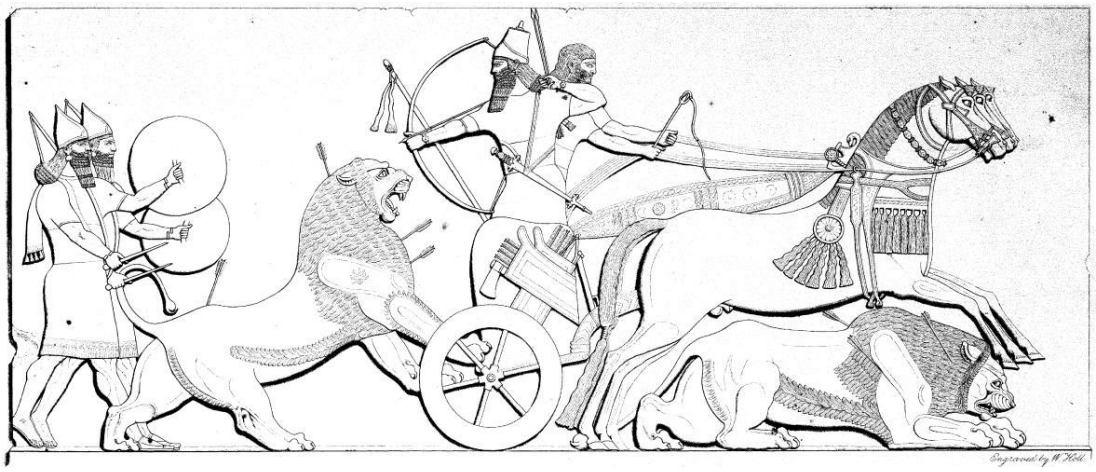

Figure 4.1: Assurnasirpal II hunting lions from a chariot; after Layard 1853a, pl. 10 (drawing of Budge 1914, pl. 12).

The idiom of the king as a hunter featured in Near Eastern royal iconography at least as early as the late Uruk Period, as a stele from the late 4th Millennium BC from Uruk itself depicts a man hunting lions with both bow and spear.[2] The motif of the ruler (or other high status individuals) hunting from a chariot begins to be attested in the Near East in the 16th Century BC, which Moortgat associated with the expansion of the Hurrians.[3] It became widespread by the second half of the 2nd Millennium BC, with examples in locations such as Egypt,[4] Ugarit,[5] Emar,[6] and Babylonia.[7] A single 12th Century BC seal from the archives of Ninurta-tukulti-Aššur in Assur itself.[8] Hunting also began to be featured in royal inscriptions during the reign of Tiglath-Pileser I in the late 12th Century.[9] A common refrain

[1] Barnett 1974, p. 443
[2] Wilkinson 1991, p. 94, pl. 12; Collon 2008, p. 93; Moortgat 1940, no. 1
[3] Moortgat 1944, p. 38
[4] e.g. Tomb of Userhet from the reign of Amenhotep II, ca. 1430 BC (Yadin 1963, p. 186) and the lid of a box from Tutankhamon's tomb, mid 14th Century BC (Yadin 1963, pp. 214-215).
[5] From a gold bowl dating to ca. 1400 BC; Yadin 1963, p. 187
[6] A carved horn from Emar, dating to the 14th-12th Century BC; Margueron 1986
[7] Kassite seals from the late 2nd Millennium BC; Moortgat 1940, nos. 562 & 563 (see Matthews 1990, nos. 270 & 199 for more detail)
[8] The seal is not preserved, but it attested by three identical sealings; Mayer-Opificius 1986, p. 165 and Moortgat 1944, p. 38, no. 39
[9] e.g. Grayson 1991, p. 25 (A.0.87.1, vi 55-69)

which began to be used in the reign of Aššur-bēl-kala was, "the gods Ninurta (and) Nergal, who love my priesthood, gave to me the wild beasts and commanded me to hunt," followed by a detailed list of the numbers (doubtless sometimes exaggerated) of various kinds of animals slain.[10] Both Assurnasirpal II and Shalmaneser III made use of this idiom in their inscriptions.[11] Assurnasirpal II, in particular, depicted himself as a great hunter, with his reliefs showing him hunting bulls and lions with a bow from his chariot,[12] and on the White Obelisk, he hunts bulls, wild horses and stags or goats from his chariot.[13] Furthermore, an epic poem describes how, after defeating both the Hittites and the Urartians, he hunted lions in celebration.[14]

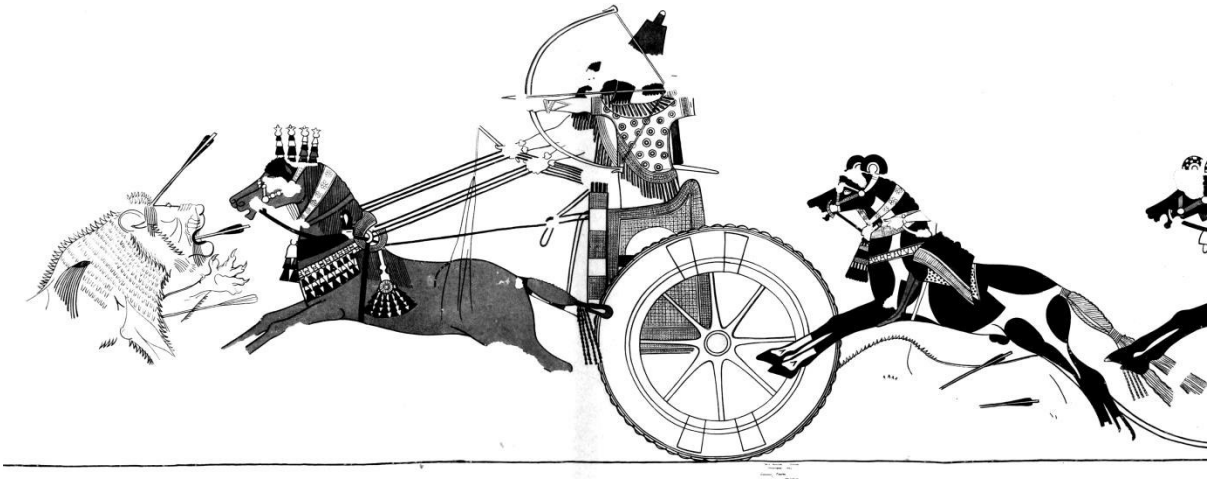

Figure 4.2: An unknown king hunting lions from a chariot, from the wall-paintings at Til Barsip; after Thureau-Dangin & Dunand 1936, pl. 53.

Curiously, however, after the reign of Shalmaneser III, hunting seems to largely disappear from royal ideology and ceases to be mentioned in inscriptions or depicted in reliefs. The few hunting scenes of Sargon II, for example, all show apparently high-status individuals hunting, but not the king.[15] The wall paintings at Til Barsip, variously dated from Tiglath-Pileser III to Assurbanipal,[16] show a king hunting lions from a chariot (see Figure 4.2).[17] Another undated depiction of hunting from a chariot is

[10] e.g. Grayson 1991, p. 93 (A.0.89.2, iii 29´-35´)
[11] for Assurnasirpal II, see Grayson 1991, p. 226 (A.0.101.2, 40-42) & p.291(A.0.101.30, 84b-101) ; for Shalmaneser III, see Grayson 1996, p. 41 (A.0.102.6, iv 40-44) & p. 84 (A.0.102.16, 341´b-347´)
[12] Budge 1914, pl. 12 – Assurnasirpal II shoots a lion with his bow in the lion hunt, but in the bull hunt, he does not actively shoot the bull. Instead, he stabs it with a dagger, however there is another dead bull already. The peppered with arrows under his chariot. In addition, the decoration of the king's robes contains scenes of the king hunting lions from his chariot with spear, sword and bow, and on foot with a sword; Layard 1853a, pls. 50:4. 48:4, 48:6, 49:4, and 49:1. Another very fragmentary depiction of Assurnasirpal II hunting lions and perhaps also bulls from a chariot was found at the Temple of Ištar in Nineveh; see Reade 2005, p. 379, fig. 19.
[13] Sollberger 1974, pls. 43-45 (bottom register of each side)
[14] SAA III 17, r29
[15] Albenda 1986, pl. 87 and figs. 76, 77 & 78
[16] Poisel 2006, pp. 121-124
[17] Thureau-Dangin & Dunand 1936, pl. 53:27e

found on an ivory panel from Room SW7 of Fort Shalmaneser (see Figure 4.3), though it is likely of North Syrian origin.[18] Regardless of the dates of these depictions, the reign of Assurbanipal saw hunting return as a major royal ideological theme. The reliefs of his North Palace feature extensive royal hunting scenes,[19] and numerous inscriptions laud the king's hunting prowess (which may have symbolized his role as protector of the realm[20]).

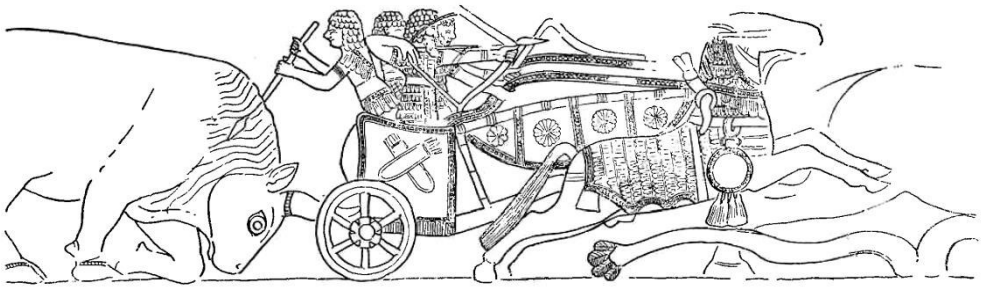

Figure 4.3: Hunting scene from an ivory panel from Room SW.7 at Fort Shalmaneser; after Mallowan & Herrmann 1974, p. 68, fig. 13.

Royal (or high status) hunting is also well-attested outside of the Assyrian context in the early 1st Millennium BC. For example, hunting in chariots is depicted on reliefs at a number of sites, such as Sakçagözü,[21] Malatya,[22] and Tell Halaf,[23] and on a fragment of decorated sheet bronze at Kayalıdere.[24] Hunting on foot is attested on a relief at Karatepe[25] and on the silver beaker from Hasanlu (see Figure 3.22). Some of these (most particularly the chariot scenes) may be influenced by Assyrian art (perhaps indirectly, through another medium such as ivories[26]), but since the royal hunt is itself of consderably greater antiquity than Neo-Assyrian art, one cannot presume that such hunting scenes were simple direct borrowings of Assyrian motifs, but perhaps the use of "Assyrianizing" elements on a theme that predated (and was thus presumably common to) all of these places.

Royal hunting scenes had several layers of meaning. On their surface, they presented the image of the king as strong, fearless and manly. The virility of the king is itself a significant component of Neo-Assyrian royal ideology and iconography.[27] Beyond that, however, the royal hunt also symbolized the

[18] Mallowan & Herrman 1974, Panel 9, p. 68, pl. 3
[19] Barnett 1976, pls. 8, 46, 47, 54 & 56
[20] Weissert 1997, pp. 355-356
[21] Ussishkin 1966, p. 19, fig. 3
[22] Wilkinson 1991, p. 96, pl. 15
[23] Winter 2009e, p. 403, fig. 13
[24] The bronze sheet fragment may have belonged to a bronze belt; Burney 1966, p. 78.
[25] Winter 2009d, p. 521, fig. 16
[26] see Winter 2009e
[27] Ataç 2010, pp. 59-60

triumph of the order of civilization (the most powerful member of which was the king) over the chaos of nature (the most powerful member of which was the lion).[28]

Watanabe has argued that the royal hunt was intended to re-enact the myth of Ninurta slaying Anzû (see Figure 3.10), describing it as a "cult drama,"[29] and though it is not clearly indicated that this is indeed the case, there are some parallels. Both the king and Ninurta hunt their prey on foot and chariots, both return victorious from their hunt in chariots, and the king is described as "swift" when hunting on foot, which could be related to ritual foot races carried out in honor of Ninurta in the month of Kislimu.[30] Explicit connections between the royal hunt and the Ninurta myth are lacking, however, thus leaving this argument rather speculative. Nevertheless, the royal hunt did clearly have a religious aspect. The invocation of Ninurta and Nergal in inscriptions related to hunting show that the royal hunt was, at least in part, a religious duty, and the libation sometimes performed at the end of the hunt[31] suggests that this duty took the form of a religious rite (see Figure 3.14 and Figure 4.4). In showing the king victorious over the forces of nature, the royal hunt asserted "the divine power behind the king's success in battle."[32]

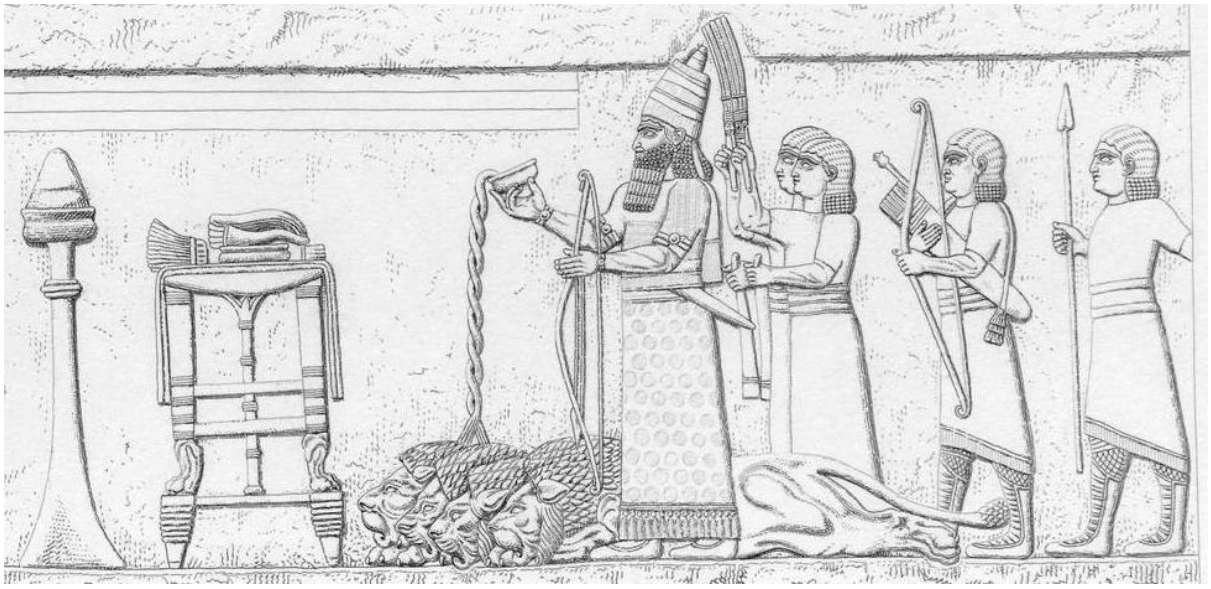

Figure 4.4: Assurbanipal pours libation over dead lions after hunt; after Place 1867, pl. 57 (detail of Barnett 1976, pl. 56).

A number of seals of Neo-Assyrian officials bear a special form of lion hunting scene, featuring the king stabing a rampant lion (see Figure 4.5).[33] Reliefs of Assurnasirpal II[34] and Assurbanipal[35] both

[28] Watanabe 1998, p. 439
[29] Watanabe 1998, p. 439
[30] Watanabe 1998, pp. 442-444
[31] e.g. Assurnasirpal II: see Budge 1914, pl. 19; Assurbanipal: see Barnett 1976, pl. 59
[32] Albenda 1972, p. 178
[33] Sachs 1953; Herbordt 1996; Radner 2008, pp. 487-494; Nadali 2009-2010

contain examples of similar imagery, though always in the context of a larger hunting scene (see Figure 4.6). Winter observed that, though the motif itself may be the same on seals and in reliefs, the difference in context changes the meaning of the scene.[36] In the extended hunting scenes in Assurbanipal's reliefs, the stabbing of the lion is just one episode on a narrative, starting with the pursuit of the prey and ending with libations over the corpse of the slain animal.[37] On the seals, however, the focus is entirely upon the king and the lion. Their similarity in size suggests an equality that stresses the duality that they represent (order versus chaos), which may have been related to the role these seals played in the bureaucracy of the state. The imagery of the "lion combat," as Winter terms it (as opposed to the "lion hunt" of the reliefs)[38] emphasizes the order of society which is derived from the king, in whose name the sea l is being used.

Figure 4.5: Sealing from a royal seal depicting the king stabbing a rampant lion, from Khorsabad; after Nadali 2009-2010, p. 220, fig. 4a.

Figure 4.6: Assurbanipal stabbing a rampant lion, detail from a large hunting scene; after Barnett 1976, pl. 46.

Hunting in official state iconography, therefore, focuses on the royal hunt and the symbolic role the king played in it. Yet there are several cases where individuals besides the king are shown taking part in the royal hunt, or even hunting on their own without the king present, which would seem to undercut the ideological message of royal iconography. This is particularly surprising in lion hunts, as there is considerable evidence to suggest that the hunting of lions was limited to the king alone, at least in the 2nd Millennium BC.[39]

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[34] Part of a lion hunt scene decorating the king's robes; Layard 1853a, pl. 49:1
[35] Barnett 1976, pl. 46 (upper register, far right)
[36] Winter 2009a, pp. 112-120
[37] Note that the Assurnasirpal II scene omits the libation, and the narrative is not clearly expressed as the various episodes are disjointed due to the hunting scene appearing on the decorated trim of the king's robe, the folds and creases of which disrupt the flow of the narrative (and possibly obscure a libation scene). See Layard 1853a, pls. 48-50.
[38] Winter 2009a, pp. 112-120; Radner refers to the same motif as the "lion killer"; see Radner 2008, p. 487.
[39] Watanabe 1998, pp. 445-446

Iconography from the reign of Assurnasirpal II contains several examples common Assyrian soldiers taking part in royal bull and lion hunts. On his reliefs, the elaborate decorations of the robes of the king contain one scene where the king, in his chariot, fires at lions from the right while a cavalryman fires at them from the left (see Figure 4.7).[40] Similar scenes can be found on the bronze bands of the doors of his palace at Balawat, where the king and other high-status individuals hunt bulls and lions from chariots while common Assyrians on foot fire at the same quarry.[41] The bull hunt scene (see Figure 4.8) closely parallels scenes depicting the battle against Bīt-Yakin from the same door (see Figure 4.9). In all of them, the king fires from his chariot from one side of the enemy or quarry and the standing Assyrian archer fires from the other side.[42] Furthermore, in all depictions, the king's chariot is running over a dead or dying enemy or bull. Clearly, the hunting of bulls is intended to mirror the fighting of war. In these cases, the presence of the archer may be intended to signifiy that the enemy/quarry is surrounded and has no chance of escape, thus not diluting the ideological message but rather adding an extra dimension to it.

Figure 4.7: Bull hunting scene, from the decorations of the robes of Assurnasirpal II; after Layard 1853a, pl. 48:6.

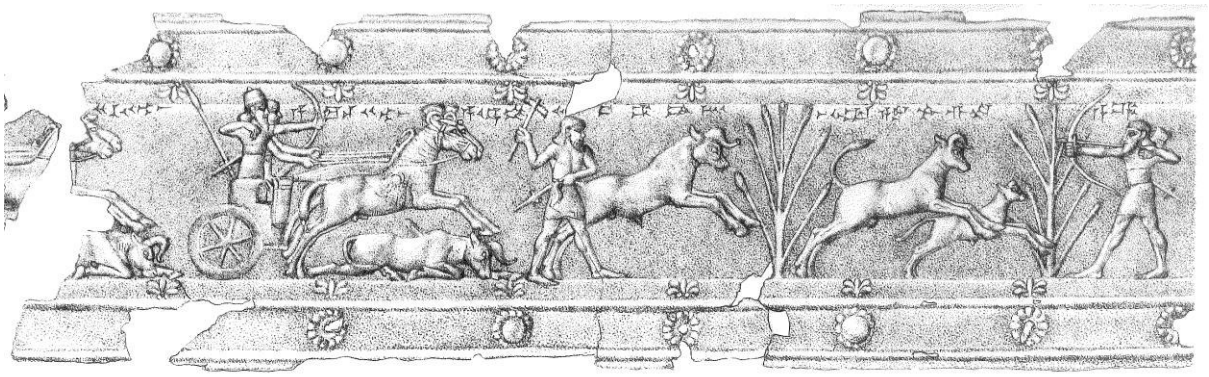

Figure 4.8: Bull hunting scene from the Balawat Gates of Assurnasirpal II; after Curtis & Tallis 2008, fig. 30 (drawing of fig. 29).

[40] Layard 1853a, pl. 48:6; another part of the same composition shows the king hunting lions from his chariot with a spear while a cavalryman armed with a sword pursues a gazelle.
[41] Curtis & Tallis 2008, figs. 29 (bulls) and 31 (lions)
[42] Curtis & Tallis 2008, figs. 25 & 27 (enemies), fig. 29 (bulls)

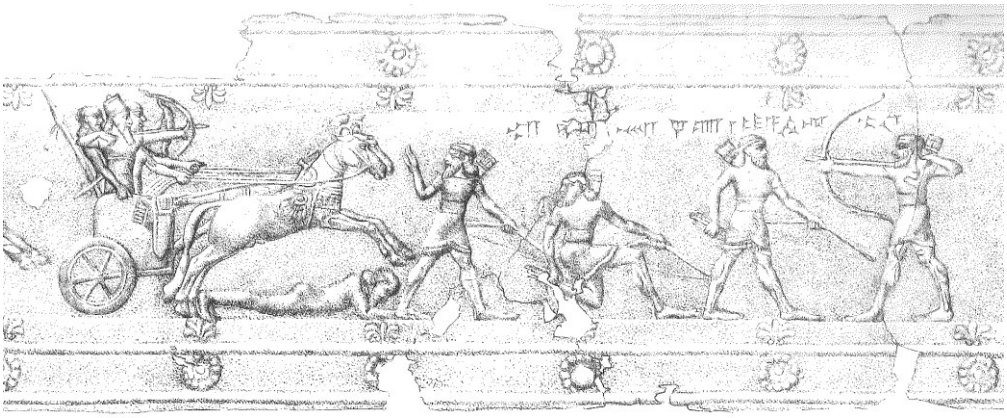

Figure 4.9: Battle scene from the Balwat Gates of Assurnasirpal II. The king fires at enemies from Bīt-Yakin while a common Assyrian (far right) fires at the same; after Curtis & Tallis 2008, fig. 28 (drawing of fig. 27).

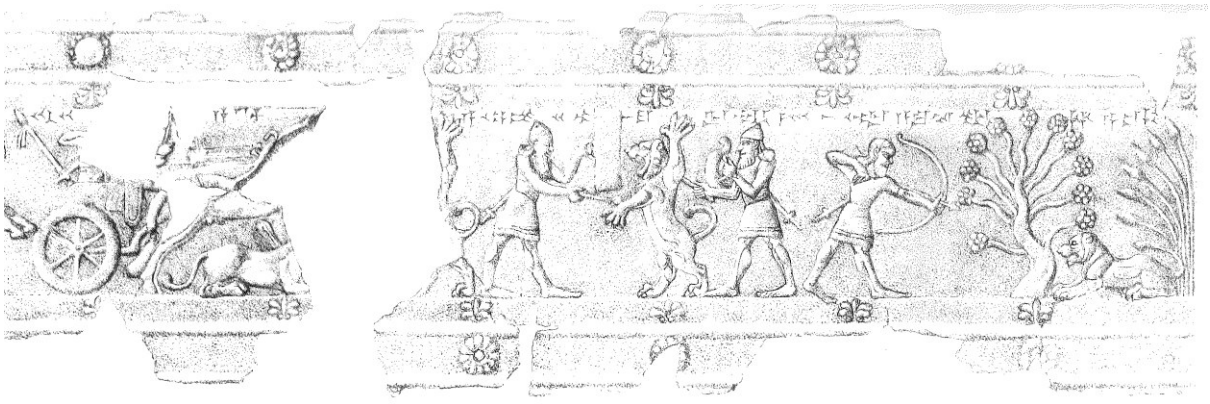

Figure 4.10: Lion hunting scene from the Balawat Gates of Assurnasirpal II; after Curtis & Tallis 2008, fig. 32 (drawing of fig. 31).

The lion hunt,[43] on the other hand, is more ambiguous. The king fires at lions from a chariot (with a dead lion under its wheels), and further along in the scene, the king, on foot and aided by a shieldman, stabs a rearing lion while a lone archer fires at a crouching lion (see Figure 4.10). In the bull hunt and war scenes, the archers aid the king, however in this context, the archer is apparently acting alone. He bears no indications of any rank, thus must be assumed to be a common Assyrian. This would seem to detract from the ideological messages encoded in the royal hunt, as these messages require the king to be the principal actor. The decorations of the robes of Assurnasirpal II on his reliefs also contain a similar example (see Figure 4.11).[44] Though the decoration is on the person of the king, the individual hunting the lions does not wear a royal crown and appears to be a common Assyrian. It is only a small portion of the decorations on the robes, and thus could carry no ideological message beyond the straightforward statement that the king had the wealth and resources to have elaborately

[43] Curtis & Tallis 2008, fig. 31
[44] Layard 1853a, pl. 49:3 & Canby 1971, pp. 33-34 & fig. 2

decorated garments. Nevertheless, the depiction of an apparently non-royal lion hunt on the king's own clothing seems to undermine the ideology of the royal hunt.

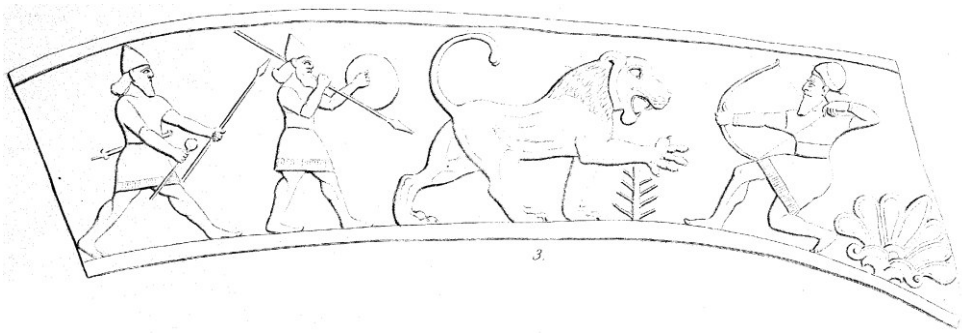

Figure 4.11: Common Assyrians hunt a lion, from the decoration on the robes of Assurnasirpal II; after Layard 1853a, pl. 49:3.

In Shalmaneser III 65, Assyrians are shown hunting birds with bows in southern Babylonia,[45] perhaps foraging for the Assyrian army (see Plate 4B). Lions and bulls were the typical quarry of the royal hunt in Assyria, thus this scene may in fact merely be a depiction of everyday hunting , the ideological message of which would be a more generalized assertion of Assyrian domination and exploitation of conquered lands.

In addition, the reliefs of Sargon II at Khorsabad show several scenes in which beardless figures (perhaps eunuchs) hunt while the king is not present. In Sargon II F76, two individuals wearing high-status garments - a beardless man and a short bearded figure (perhaps the crown prince, Sennacherib[46]) - hunt with bows, and a third wearing more common garments carries away a dead gazelle and rabbit (see Plate 4C).[47] In Sargon II 87, a beardless man shoots birds.[48] While he does not wear particularly high-status garments or other marks of rank, he is followed by a man who is apparently his attendant, holding the reins of a horse as well as a dead rabbit. A third scene mimics this, with a beardless man without any marker of rank hunting birds, accompanied by a shorter individual carrying a spear.[49] These reliefs were found in the area of the "detached building"[50] and

[45] King 1915, pl. 65
[46] Bottéro 1985, p. 46
[47] Albenda 1986, fig. 76 & Layard 1853b, pl. 32
[48] Albenda 1986, pl. 87
[49] Albenda 1986, figs. 77-78
[50] The "detached building" is often referred to as a *bīt hilāni* (see Albenda 1986, p. 49), a type of building originating in northern Syria which is conventionally defined as a palatial structure featuring one or two elongated rooms surrounded by smaller rooms, and a columned portico with a wide stairway on one of the long sides of the primary room (Frankfort 1952, p. 120; Osborne 2012, p. 29). This definition has been the subject of some debate, however (see Orborne 2012, pp. 31-32), and it has been suggested that, among other possibilities, the term may have referred to small pleasure palaces located in landscaped gardens (see Winter 1982, p. 358 and Winter 1993, pp. 33-34).

their primary audience may have been high-status Assyrians who themselves engaged in hunting of the kind depicted.[51]

Assurbanipal NP 44, which is broken and in two fragments, may portray non-royal hunting.[52] In one fragment, two men carry a dead dear, pierced by an arrow in its breast, while a stag leaps in the landscape above them (see Figure 4.12). The feet of a man are just visible on the left side of the fragment. On the other fragment, several men have erected a net into which deer (one of whom has already been hit by two arrows) are being driven. Unfortunately, the surviving portions of this scene do not include the hunter or hunters. However, this relief is from Room S of the North Palace, which includes extensive scenes of Assurbanipal hunting animals.[53] Furthermore, Room S is approached by the long corridor Room R, which has reliefs showing attendants carrying various kinds of gear, including folded nets, towards the hunting scenes in Room S, as well as carrying dead lions away.[54] This suggests that all of the hunting scenes in Room S were intended to be taken together as depictions of the royal hunt, thus the missing archer is indeed most likely Assurbanipal.

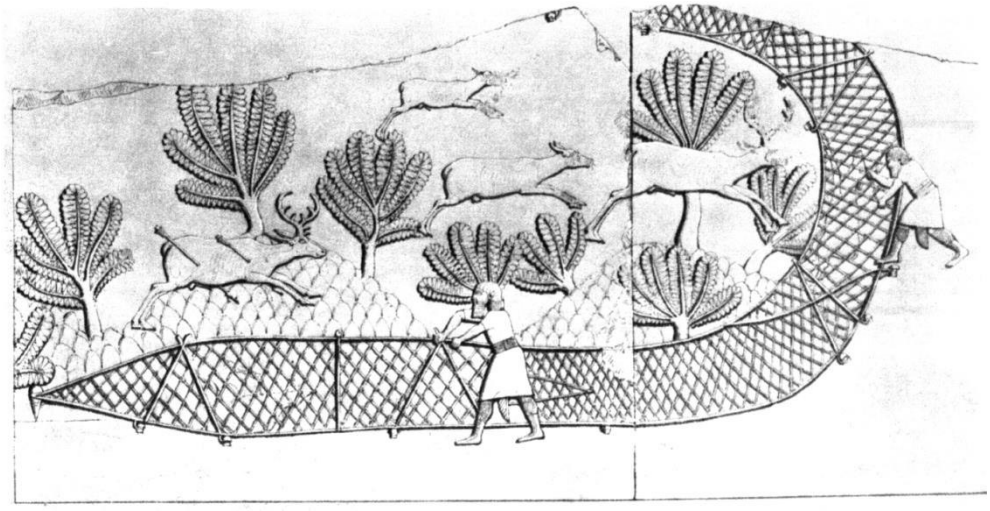

Figure 4.12: Two men raise a net to trap deer which are fleeing from an archer (one already pierced by two arrows). From the reliefs of Assurbanipal; after Barnett 1976, pl. 44.

Seals offer the largest corpus of hunting-related iconography relating to the private rather than royal or official realm. Archers hunting animals was a common theme on Neo-Assyrian seals, wherein kneeling or standing archers are depicted hunting a variety of animals, including bulls, goats, rams, stags, gazelles, lions, and birds (see Figure 4.13).[55] Far less common are scenes wher the archer is

[51] Reade suggests that some battle scenes may have also been primarily intended for the enjoyment of Assyian courtiers that took part in those or similar battles; see Reade 1979b, p. 339.
[52] Barnett 1976, pl. 44
[53] Barnett 1976, pls. 46-54
[54] Barnett 1976, pls. 39-43
[55] Delaporte 1923, pls. 86:8, 86:9, 86:12, 86:15,87:17; Moortgat 1940, nos. 627, 641, 642, 643, 698-705, 707, 708 & 747; Porada 1948, nos. 617, 618, 621 & 622; Parker 1955, pls. 13:1 & 16:3; Parker 1962, pls. 11:3, 13:2

mounted[56] or in a chariot.[57] The archer in hunting scenes sometimes wears the courtly robes of high-status individuals,[58] but in others, the archer wears the tunic and kilt of common Assyrians.[59] Assuming that the figure depicted is intended to be the owner of the seal, suggests that this motif was used by both high-status and low-status Assyrians.

The archer depicted on the seal may not, however, represent the seal-owner himself. Moortgat considers some of the archers *Helden*,[60] however there is nothing to distinguish them from other archers wearing high-status robes. More convincing arguments against the archer representing the seal-owner can be made for those with scenes depicting archers hunting mythological creatures, which indeed appear to have been somewhat more prevalent even than hunting scenes involving normal animals. In these scenes, the kneeling or standing archer aims his bow at griffins, winged bulls, winged lions, winged horses, horned serpents, scorpion-men, and other forms of mythological creatures (see Figure 4.14).[61] In a handful of cases, the archer is also a mythological creature,[62] suggesting that some of the hunt scenes were intended to depict mythological events or stories. Some depictions of hunting are clearly representations of mythological scenes, such as the archer deity firing at the rearing winged monster (see §3.3, Figure 3.10).

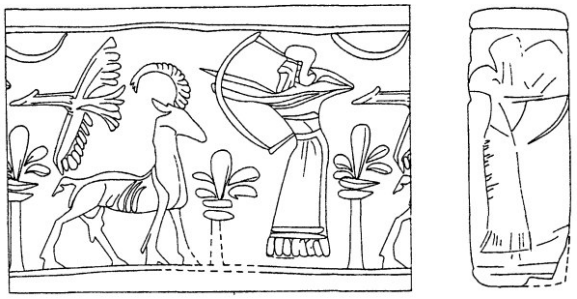

Figure 4.13: An archer hunting a goat and a flying bird, from a seal in the provincial Assyrian style from Hasanlu; after Marcus 1996, p. 120, fig. 87.

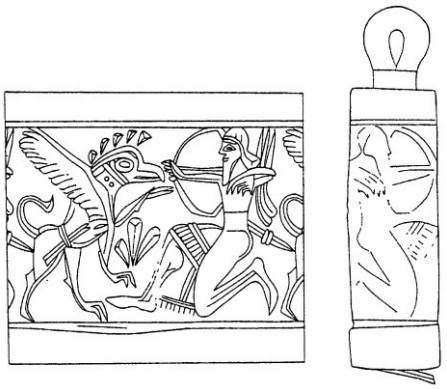

Figure 4.14: An archer hunting a griffin, from a seal in the central Assyrian style from Hasanlu; after Marcus 1996, p. 115, fig. 80.

& 14:4; Buchanan 1966, nos. 574, 616-618; Kühne 1980, nos. 88 & 89; Herbordt 1992, pl. 5, nos. 1 & 3; Marcus 1996, nos. 63-66; Keel-Leu & Teissier 2004, nos. 160 & 166

[56] Moortgat 1940, no. 653, Porada 1948, no. 624; Parker 1955, pl. 14:3; Keel-Leu & Teissier 2004, no. 181

[57] Porada 1948, nos. 661 & 778; Keel-Leu & Teissier 2004, no. 180; a seal dated to the 10th-8th Centuries BC

[58] e.g. Moortgat 1940, no. 701 & Buchanan 1966, no. 613

[59] e.g. Moortgat 1940, no. 641 & Parker 1962, pl. 13:2

[60] Moortgat 1940, nos. 624, 691, 696 & 701

[61] Delaporte 1923, pls. 86:10, 86:13, 86:14, 86:16, 86:17, 86:18, 86:19; Frankfort 1939, pls. 34a & 34g; Moortgat 1940, nos. 624, 625, 639, 640, 689-693, 695-697 & 706; Porada 1948, nos. 611-616, 620, 623, 725 & 749; Parker 1955, pls. 10:4, 15:1, 15:2 & 16:2; Parker 1962, pls. 16:4, 16:5, 17:3 & 18:6; Buchanan 1966, nos. 575-577, 614, 615, 624-626 & 639; Kühne 1980, no. 90; Homès-Fredericq 1986, p. 252, fig. 1:b; Herbordt 1992, pl. 5, nos. 6-13; Marcus 1996, nos. 57-60, 67-70; Keel-Leu & Teissier 2004, nos. 165, 167, 168, 170-178

[62] Delaporte 1923, pls. 86:20 (archer is a winged centaur), 89:14 & 89:16 (archers in the latter two appear to be ostrich-centaurs) ; Frankfort 1939, pl. 34d (archer is called a "lion-centaur" on p. 198), Porada 1948, nos. 610 (archer is called a 'griffin-demon' on p. 74) & 749 (archer is a centaur).

All of the typical hunting scenes found on early 1st Millennium BC seals have precedents in the 2nd Millennium BC and sometimes evern earlier. The striding or standing archer firing at his quarry appears as early as the Halaf Period,[63] though kneeling archers are first attested in the 3rd Millennium BC.[64] Mythological creatures as archers also appear early 3rd Millennium BC.[65] However, the early 1st Millennium BC witnessed a far greater usage of hunting archer motifs than in earlier periods. Boehmer's study of Old Akkadian glyptic contains a single example of a hunting archer, less than 0.2% of the total corpus of 726 seals,[66] while there are no archers at all among the 326 Old Babylonian seals surveyed by al-Gailani Werr.[67] By the late 2nd Millennium BC, the hunting archer appears on a modest number of seals, representing 3.8% of the corpus reviewed by Matthews.[68] However, the relative proportion is far greater in collections of seals from the early 1st Millennium BC; for example, 14.4% of Neo-Assyrian and Neo-Babylonian seals reviewed by Buchanan[69] are hunting archers, as are 14.8% of the early 1st Millennium BC seals in Keel-Leu & Teissier,[70] and a full 18.0% of Neo-Assyrian seals in Moortgat.[71] As Matthews observed, the repertoire of Assyrian glyptic expanded as the Assyrian Empire's fortunes waxed in the 13th Century BC, and then decreased as the empire's power waned in the 12th and 11th Centuries BC.[72] One may therefore expect the glyptic repertoire to expand again as Assyrian power began to re-assert itself in the Neo-Assyrian Period.

Why hunting archers feature so prominently in the expanded Neo-Assyrian glyptic repertoire is not clear, however, though Frankfort postulated that they were a development of the "contest" scenes (where a hero attackes a ferocious creature) which are well-attested in earlier periods.[73] Private seal iconography may also have been indirectly influenced by the extensive displays of public iconography, with its frequent motif of the king as a heroic hunter. Private glyptic does not directly duplicate the conventions used in depictions of the royal hunt, however, but rather expands on the standing and kneeling hunter motifs already attested in Assyrian glyptic in the mid 2nd Millennium BC. Matthews observed the the Assyrian glyptic syle was the dominant style in the Neo-Assyrian Period, with other styles being adaptations of it.[74] It may, therefore, be expected that the increase in

[63] Collon 2008, p. 103, fig. 1. See also figs. 3 & 5 (Uruk Period)
[64] Boehmer 1965, no. 359 (Old Akkadian). Note that in this case, the kneeling archer is a deity. A possible prehistoric kneeling archer is attested on a seal from Habuba Kabira, however the archer aappears to be sitting rather than kneeling; Collon 1987, no. 682.
[65] Collon 2008, p. 104, fig. 6 (Proto-Elamite); they appear on Assyrian seals in the 12th Century BC; Moortgat 1944, pp. 41-42, nos. 43-44.
[66] Boehmer 1965 (1 example out of 726)
[67] al-Gailani Werr 1988
[68] Matthews 1990 (24 examples out of 626); see Moortgat 1942, pp. 58-60, nos. 11-18, for 13th Century BC Assyrian examples.
[69] Buchanan 1966 (14 examples out of 97)
[70] Keel-Leu & Teissier 2004 (17 examples out of 115)
[71] Moortgat 1940 (29 examples out of 161)
[72] Matthews 1990, p. 90
[73] Frankfort 1939, p. 198
[74] Matthews 1990, p. 117

the hunting archer would have begun in Assyria (perhaps due to the influence of the extensive royal iconography there) and then spread to surrounding areas where the motif is also found (such as at Babylon,[75] Kish,[76] and Hasanlu[77]). The lack of precise dating makes this difficult to confirm, however.

4.2. Warfare

Considering their prevalence in Assyrian iconography and the numbers mentioned in administrative texts (see §3 and §4.2.5), archers were arguably the backbone of the Assyrian military.[78] The vast majority of archery-related iconographic and textual evidence concerns warfare rather than hunting. The most extensive evidence for how archery was employed in warfare is that found in palace reliefs. Iconographic depictions of Assyrian soldiers are invariably somewhat stylized, however, and how closely they represent the reality may be debated (see §3.2.2). Interpreting tactical operations from reliefs is difficult at best, and all results must be considered hypothetical since we have no way to gauge to what degree the craftsmen who created the reliefs were familiar with military tactics or equipment, nor to what degree the reliefs were stylized or symbolic. Thus it must be stressed that all conclusions based on iconographic sources must include the caveat that while they may apply to how the Assyrian military was depicted, they may not apply to how it operated in reality.

4.2.1. Archers in the organization of the Assyrian military

A thorough overview of the Assyrian military's organization has been difficult to reconstruct. The orignization of the army and the roles of its personnel changed over time. Most significant in this regard are the "reforms" to civil and military organization attributed to Tiglath-Pileser III,[79] though, as there is no evidence that he issued any deliberate or formal reforms,[80] it is more likely that these changes represent a rapid process of organizational adaptation to the challenges of a swiftly expanding empire. Furthermore, while there are a multitude of military-related administrative texts from the period, they generally only illuminate certain specific areas of the military at specific times.[81]

Reconstructing a clear representation of the organizational structure of the Assyrian military is further complicated by the appearently polyvalent nature of its structure, wherein specific units and

[75] Moortgat 1940, nos. 706 & 708
[76] Buchanan 1966, no. 615
[77] Marcus 1996, nos. 57-60 & 63-70
[78] Contrarily, Fales, while speaking solely of infantry, suggested that spearmen were the principle Assyrian soldier, who were supported by archers; Fales 2010, p. 112.
[79] e.g. von Soden 1963, p. 143
[80] Harrison 2005, p. 24
[81] e.g. the Nimrud Horse Lists, which concern equestrian officers who fought in the Babylonian campaigns of Sargon II (Dalley & Postgate 1984) and the archives of Rēmanni-Adad, a *mukil appāte* of Assurbanipal, which mention many of his military colleagues (Fales 1987; also Dezső 2012b, pp. 166-183)

individuals may have been categorized or classified by multiple different criteria. Postgate identified four different criteria by which the Assyrian soldiers were divided and organized: rank, origin (or ethnicity), activity (i.e. the weapon or mode of transportation of the soldiers), and status (organizational branch or section of the military).[82] However, as rank is applied to individuals within each branch of the military, I propose combining rank with status and replacing the fourth category with "function" (specific roles or functions designated for certain units), which are conspiculously mentioned in textual sources.

4.2.1.1. Rank/organizational hierarchy

From at least the time of Tiglath-Pileser III, the army was divided into two principal parts – the *kiṣir šarrūti* (the professional "standing army," [83] also translated "royal corps,"[84] "royal cohort,"[85] "home army,"[86] etc.) and the provincial armies, largely composed of the *ṣāb šarri* (the "king's men,"[87] "king's troops,"[88] etc.) as well as the *ša kutalli* ("reserves"[89]). While the *kiṣir šarrūti* had its headquarters in the Assyrian capital,[90] some of its units were stationed in the provinces alongside the provincial armies and were even, at times, commanded by local governors. [91]

The principal distinction between the *kiṣir šarrūti* and the *ṣāb šarri* appears to have been the manner in which their troops were recruited. Fales defined the *ṣāb šarri* specifically as "all elements of the male population liable for recruitment or other forms of conscription within the armed forces of Assyria."[92] Thus, while it did have a certain number of professional soldiers and officers,[93] the *ṣāb šarri* was principally composed of conscripts, some of whom served as soldiers while others served in a variety of non-combatant roles. [94] Some proportion of the soldiers of the *ṣāb šarri* were fulfilling their *ilku* obligations through military service,[95] and in some cases, the *ilku* obligation was a result of their ownership of a "bow field,"[96] a rather evocative term which suggests that the ownership or

[82] Postgate 2007, p. 343-345
[83] Dalley & Postgate 1984, p. 27. The term "standing army" was first applied to the *kiṣir šarrūti* by Manitius in his seminal study ("*stehende Heer*," "*stehende Söldnerheer*," or "*stehende Volksheer;*" Manitius 1910), however Postgate cautioned that employing this expression may lead to misapprehensions, since we do not know if these forces were indeed on active military service year-round; Postgate 2007, p. 351.
[84] Dezső 2012a, p. 23; Kaplan 2008, p. 136
[85] Postgate 2007, p. 347
[86] Dalley & Postgate 1984, p. 27
[87] Dezső 2012a, p. 76
[88] Postgate 2000, p. 106
[89] Postgate 1974, pp. 223-224
[90] Postgate 2007, pp. 18-19
[91] Dezső 2012a, p. 195; Saggs 1963, p. 146
[92] Fales 2009b, p. 77
[93] Postgate 2007, p. 351
[94] Fales 2009b, pp. 77-82; Dezső 2012a, pp. 75-78; Meyer 2002, pp. 10-11
[95] It should be noted that military service was only one form of *ilku* obligation, which also included payment in kind and service to temples; Postgate 1974, pp. 80-93.
[96] e.g. SAA V 16, 6

usufruct of such a field required an archer to be provided to the *ṣāb šarri*, typically for a fixed period of time.[97]

The *kiṣir šarrūti* and *ṣāb šarri* were both divided into a variety of smaller *kiṣrū* (a term which appears to have had the general meaning of "unit" or "cohort" and could be applied to units of any size[98]). These units were classified or distinguished by a number of factors, and it is not always clear to what degree these categories may have overlapped, so that the same individuals or units may have been classified under different designations depending on the context of the document mentioning them. For example, the Itu'eans at Zamua[99] could be classified as members of the *ṣāb šarri*, auxiliary troops, infantry, or (presumably[100]) archers, depending on the context of the reference.

Units were often assigned to specific institutions or officials, such as the palace, the Chief Eunuch, the queen, the vizier, etc.[101] In some cases, this assignment reflected the nature of the duties of the unit. The soldiers assigned to the Chief Eunuch (*rab ša rēšē*),[102] for example, likely represented combat troops under his direct command. However, those assigned to the queen or other members of the royal family most likely provided bodyguard and escort services[103] (see §4.2.1.3).

Some units of the *kiṣir šarrūti* were named after a deity (such as the "*kiṣir* of Šamaš" mentioned in a ration list from the 8th Century BC[104]) and the "city units" of the *kiṣir šarrūti* were named after the cities of the Assyrian heartland which raised them.[105] Other units were distinguished based on the ethnicity or origin of their members and others based on their equipment or transportation (which will be discussed below, see §4.2.1.2 and §4.2.1.4, respectively).

It appears that personnel within each basic *kiṣru* were typically formed into divisions of 50 men, each commanded by a *rab hanšê* ("Commander-of-Fifty").[106] A further division into units of 10 men commanded by a *rab ešerti* ("Commander-of-Ten") is attested in reference to workmen, though it is not attested for soldiers.[107]

[97] Postgate 1974, p. 222
[98] Dezső 2012a, p. 159
[99] see Postgate 2000
[100] Postgate 2000, p. 101; Dezső 2012a, p. 33
[101] See Dezső 2012a, pp. 170, 171, 177, and 179, respectively.
[102] Dezső 2012a, p. 171
[103] Dezső 2012a, p. 178
[104] Dezső 2012a, p. 157
[105] Dezső 2012b, pp. 78-80
[106] Dezső 2012a, p. 154
[107] Dezső 2012a, p. 154

4.2.1.2. Origin/ethnicity

Prior to the reign of Tiglath-pileser III, the personnel of the Assyrian military appears to have been largely composed of ethnic Assyrians (though there appear to have been at least small numbers of non-Assyrians even in the 9th Century BC)[108]. They are generally identified on earlier reliefs as the individuals with neatly curled beards and wearing conical helmets.[109] Under Tiglath-pileser III (or, at least, first attested in his reign), large numbers of non-Assyrians began to be included in the Assyrian military, a practice which continued to the end of the period. [110] These Non-Assyrians did not merely serve in menial, low-level capacities; some served in the cavalry or chariotry,[111] a fairly high-status occupation, normally reserved for ethnic Assyrians,[112] and the king's own bodyguard also included non-Assyrians.[113]

Non-Assyrian soliders from subject groups who were formed into units of their own are normally collectively referred to as "auxiliaries" in the secondary literature[114] (on analogy with the *auxilia* of the Roman Empire[115]), however Assyrian texts do not appear to have a general term for them. Instead, texts refer to auxiliary units by the name of the specific tribe or ethnic group from which the soldiers in question derive (most notably Gurreans and Itu'eans,[116] who are depicted in iconography as spearmen and light archers, respectively[117]). Indeed, auxiliary units appear to have generally been organized based on the ethnic/national origin of the soldiers in question. Gurrean and Itu'ean soliders, in particular, were often discussed in administrative texts as distinct from other forces, such as in the report to Sargon II of the Assyrian forces at Zamua.[118] As the Zamua text indicates, auxiliary units were spread throughout the Assyrian military (though principally in the *ṣāb šarri*, according to Postgate[119]).

Non-Assyrian soliders were also sometimes derived from defeated opponents. Royal inscriptions from the reign of Tiglath-Pileser III through that of Assurbanipal (and particularly under Sennacherib[120]) mention large (and likely somewhat exaggerated) numbers of infantrymen,

[108] Kaplan 2008, pp. 135-136
[109] Postgate 2000, p. 104; Nadali 2005, p. 223
[110] Nadali 2005, p. 222
[111] Dezső 2012b, p. 33
[112] Nadali 2005, p. 222
[113] Kaplan 2008, p. 137
[114] e.g. Reade 1972, p. 101; Nadali 2005, p. 222; Dezső 2012a, pp 25-52
[115] Goldsworthy 2003, p. 55
[116] Dezső 2012a, p. 50; Postgate 2000, pp. 100-104
[117] Postgate 2000, pp. 102-104
[118] Postgate 2000, p. 90; see also Dezső 2012a, p. 50, for Gurreans and Itu'eans garrisoning forts.
[119] Postgate 2007, p. 16
[120] e.g. Luckenbill 1924, p. 76; RINAP III, Sennacherib 4, 59; RINAP III, Sennacherib 15, v10; RINAP III, Sennacherib 16, v33

cavalrymen and charioteers from defeated enemy forces conscripted into the *kiṣir šarrūti*[121] as well as the *ṣāb šarri*.[122] Like other auxiliaries, these were often formed into their own units based on the ethnic/national origin of the soldiers, such as the *Kaldāia* and *Sāmerināia* cavalry units (at least partially composed of Babylonians and Samarians, respectively),[123] though others were included in generalized 'deportee' units without any specific ethnic attribution.[124]

4.2.1.3. Principal function

Units of the Assyrian military were sometimes grouped or categorized based on their principal function or duty. The main distinction in this regard is between general purpose units and those designated for bodyguard duty.[125] Bodyguards were organized into two groups: the *ša šēpē*, who appear to have been largely (though not exclusively[126]) infantry, and *ša qurbutē*, who were principally cavalry and chariotry and they appear to have had a higher status, sometimes serving as officials in their own right.[127] Dezső identifies bodyguards with shieldmen on reliefs,[128] though administrative texts often refer to shieldmen specifically without specifically designating them as bodyguards.[129] Textual sources do not explicitly state the sorts of weapons used by bodyguards, though it is not unreasonable to suppose that at least some of the shieldmen depicted in reliefs were serving as official bodyguards. However, bodyguards did not necessarily have to be armed with shields; reliefs sometimes depict the king flanked by attendants (presumably bodyguards) armed only with bow and sword (e.g. Figure 3.11).

Messengers may have also been classified separately from other troops. The term *kallāpu* (some of whom are mentioned in the Zamua letter[130]) has been interpreted both as a mounted courier or scout and as a form of light troop, though the context of its usage in some texts (such as their participation in ambushes) tend to argue more for a form of combatant than messenger.[131] A specific form of *kallāpu* – the *kallāpu šipirte* – may have indeed served as a messenger or bearer of orders, however they appear to have also exercised some degree of authority as an official.[132]

[121] see Dezső 2012a, p. 95, fig. 4; Dalley 1985, pp. 34-35; Kaplan 2008, p. 138; Dezső 2012b, pp. 32-33 & 92-93
[122] Dezső 2012a, p. 77
[123] Dezső 2012b, p. 33
[124] Dalley & Postgate 1984, p. 37
[125] Dezső 2012a, pp. 115-142; Dezső 2012b, pp. 23-29 & 76-78
[126] For example, an inscription of Sargon II which mentions 1000 horses of his *ša šēpē* unit; see Dalley & Postgate 1984, p. 39.
[127] Dezső 2012a, pp. 121-124
[128] Dezső 2012a, pp. 116-120
[129] e.g. SAA XI 127, 1-2
[130] Postgate 2000, p. 90
[131] Postgate 2000, p. 104; Dezső 2012a, pp. 69-75
[132] Dezső 2012a, pp. 73-74

4.2.1.4. Equipment/transportation

The most significant division within the Assyrian army in relation to military equipment was that between the three basic types of solider based on their equipment or mode of transportation: chariotry, cavalry, and infantry.[133] Some of the units of the Assyrian army were made up of only one or two of these types of combatant. For example, the equestrian units of the *kiṣir šarrūti* discussed in the Nimrud Horse Lists we comprised of cavalry and chariotry, but apparently no infantry.[134] Other units, however, appear to have contained a mixture of all three (such as the unit of the *ṣāb šarri* stationed in Zamua[135]). When discussing the components that made up a unit, the Assyrians themselves would often break them down into chariotry, cavalry and infantry. For example, in the review of *ṣāb šarri* troops mentioned above, the Assyrian commander at Zamua informed Sargon II first that he had 30 chariots and their associated personnel (drivers, chariot fighters, "third men", grooms, etc.) and then that he has 161 cavalrymen together with their grooms, and then mentioned the numbers of auxiliary infantry.[136] In addition, a report to the king from Babylonia stated that the governor of Nippur had arrived with three chariots, an unstated number of cavalry, and 500 archers.[137] Postgate noted that these functional designations do not indicate rank, and could conceivably be applied to individuals at different levels of the military hierarchy.[138] As the equipment of soldiers has a direct bearing on the study of archery equipment, these three categiories will be examined in greater detail.

4.2.2. Charioteers

First referred to in Assyrian texts in the reign of Arik-dēn-ili in the late 14th Century BC[139] and first depicted in Assyrian inconographic sources in the reign of Ninurta-tukulti-Aššur (approximately 1133 BC),[140] the chariot was prominent as a status symbol (e.g., the king riding one in a procession) tfor the duration of the Neo-Assyrian Period, however its use as a weapon of war changed somewhat over the course of the period. In the Neo-Assyrian Period, the chariot seems to have been intended primarily as a mobile platform for archers. I have not been able to find a single example of a battle scene in Assyrian reliefs where the chariot does not carry an archer (though they are often accompanied by a shieldman who typically wields a short sword), and chariots used in hunting or battle invariably have quivers hung on their sides. Needless to say, it would have been difficult to use short weapons from a chariot due to their lack of range. It is perhaps surprising that there are no depictions of spear-wielding charioteers (aside from hunting scenes[141]), particularly given that there is evidence of such

[133] Fales 2010, p. 104
[134] Dezső 2012b, p. 78
[135] The unit contained Assyrian cavalry and chariotry and auxiliary infantry; see Postgate 2000.
[136] SAA V 215, 6-14 & Postgate 2000, pp. 89-90
[137] SAA XIX 125, r23-r25
[138] Postgate 2007, p. 343-344
[139] Dezső 2012b, p. 60
[140] Dezső 2012b, p. 56
[141] e.g. Barnett 1976, pl. 11

from other regions and periods (e.g., the 2nd Millennium BC Egyptian reliefs depicting the Battle of Kadesh, as well as descriptions from Homer's *Illiad*[142]). Nevertheless, Littauer & Crouwel have pointed out the difficulties inherent in using a spear from a chariot – the lack of range of a spear (particularly forward, where it would only just clear the heads of the chariot's own team of horses), the likelihood of the spear becoming trapped in a victim and torn from the charioteer's hands, and perhaps most importantly, the lack of stability of the spearman.[143] As charioteers stood in their vehicles with no apparent support behind them, so if they struck something firmly with the spear, the shock of the impact may have been sufficient to throw them from the chariot. Shooting a bow, on the other hand, would not affect the charioteer's balance to such a degree.

Chariot crews were made up of two to four individuals. The chariot invariably carried a driver or "rein-holder" (*mukil appāte*[144]), however the chariot appears to have been commanded by a second individual, who was normally armed with a bow. The terms used for this individual are a matter of some debate. Administrative texts mention the *bēl mugerri*[145] (or *bēl narkabti,*[146] written LÚ.EN.GIŠ.GIGIR), which literally means "lord of the chariot," but has been translated variously as "noble," "chariot owner," and "chariot warrior,"[147] and they appear to have been individuals of high social status.[148] Texts also mention the *mār damqi* (LÚ.A.SIG$_5$), which literally means "noble."[149] Postgate argued that *bēl mugerri* (translated as "chariot owner") referred to a "social status which had its own function within the army" as they appear to be associated with the nobility,[150] while *mār damqi* referred specifically to the soldier who commanded the chariot in combat,[151] and he implied that some individuals may have born both titles depending on the context. Radner, on the other hand, suggests that *mār damqi* was itself a more generalized term more indicative of a social status than a specific military role,[152] perhaps akin to the hereditary *maryannu* chariot warriors from 2nd Millennium BC Mitanni (and possibly derived from its Middle Assyrian counterpart).[153] Administrative texts indicate that the *mār damqi* sometimes engaged in other duties, such as acting as the escort for important individuals and even deities. [154] This, it is impossible to securely assign either of the two terms to the chariot warrior depicted in iconographic sources, and it is possible they were

[142] Archer 2010, p. 59
[143] Littauer & Crouwel 1983, pp. 188-189
[144] Postgate 2000, p. 94; Dezső 2012b, p. 93-99
[145] Dezső 2012b, p. 72
[146] Postgate 2000, p. 95
[147] Dezső 2012b, p. 72
[148] Dezső 2012b, p. 74
[149] Postgate 2000, p. 91
[150] Postgate 2000, p. 95
[151] Postgate 2000, p. 95
[152] Radner 2002, p. 9, note 96
[153] Postgate 2000, p. 91; see Reviv 1972 for a discussion of the social and military identities of the *maryannu*.
[154] Dezső 2012b, p. 99-102

two different categories of people who both served as chariot warriors, or that both terms could be used for the same person in different contexts.

The driver and chariot warrior were sometimes accompanied by a shieldman, a figure who is associated with the "third man" (*tašlīšu*) mentioned in administrative texts[155] (first attested in the first half of the 8th Century BC[156]). Later in the period, a second shieldman was sometimes added for a full crew of four. These may be the individuals called "second third men" or "deputy third men" (*tašlīšu šanû*) in texts,[157] though this does not seem likely as these individuals appear to have served an administrative rather than combat role (or perhaps as a backup),[158] and furthermore, chariot drivers also sometimes had deputy chariot drivers (*mukil appāte šanû*),[159] while doubled drivers never appear in iconographic sources.

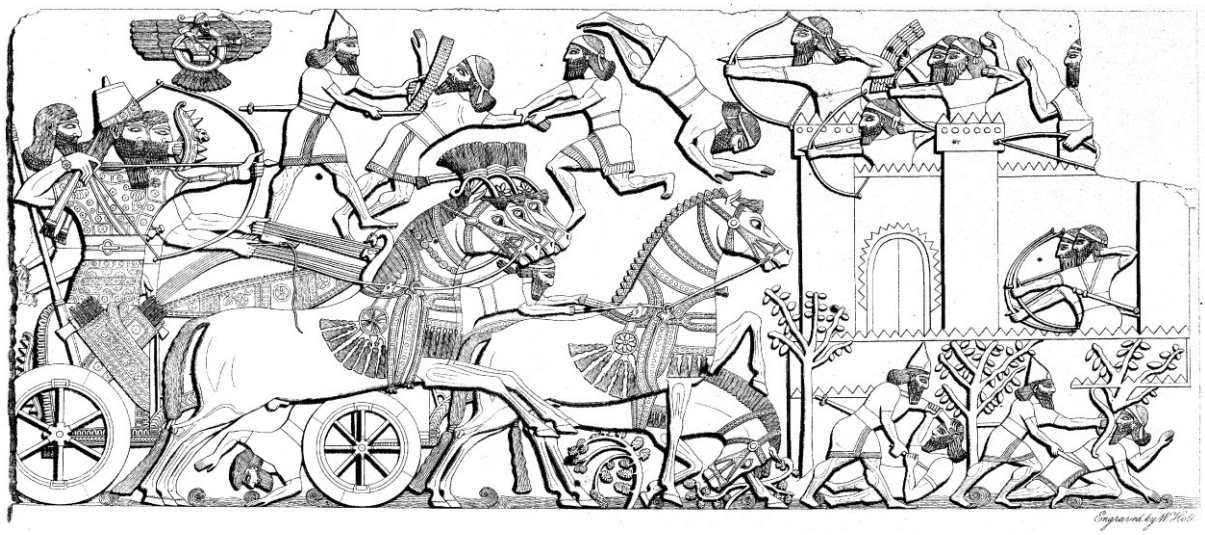

Figure 4.15: Chariot of Assurnasirpal II carrying the king, driver and third man, who holds a spiked shield (showin in profile) in front of king and driver; after Layard 1853a, pl. 13 (drawing of Budge 1914, pl. 18).

Chariots appear to have been an important part of the forces of Assurnasirpal II; he begins most of the descriptions of his campaigns with the phrase, "I mustered my chariotry and troops."[160] In reliefs of Assurnasirpal II, chariots normally are depicted carrying two people, a driver and an archer. This is always the case on the White Obelisk,[161] however on the Balawat Gates of Assurnasirpal II, the king's

[155] Henshaw 1969, p. 6-7; Dezső 2012b, pp. 102-108. Dalley & Postgate suggest that at least some of the "third men" were instead some kind of officers akin to squadron leaders; Dalley & Postgate 1984, p. 35.
[156] Dezső 2012b, p. 107 & 196-197
[157] Scurlock 1997, p. 492
[158] Dezső 2012b, p. 108
[159] Dezső 2012b, p. 93, note 730.
[160] Dezső 2012b, p. 62
[161] See Sollberger 1974, pls. 42-45. Reade uses this point to reinforce his argument that the White Obelisk dates to Assurnasirpal I, not Assurnasirpal II; see Reade 1975, pp. 145-146. A further two-man chariot apparently involved in a battle scene is attested on a fragmentary 9th Century BC ivory from Nimrud; Mallowan & Davies

chariot sometimes carries a "third man" (see Figure 4.9),[162] and it always carries a third man in battle scenes on his reliefs.[163] It is tempting to say that extra protection was given to the king in the reign of Assurnasirpal II, and that this protection was later extended to other charioteers. However, one orthostat from the Northwest Palace of Assurnasirpal II which was found reused in the Southwest Palace proves that even in the reign of Assurnasirpal II, the third man was not limited solely to the king's chariot. This relief features two chariots, both of which carry driver and archer wearing long armor coats as well as an unarmored shieldman (see Figure 4.16).[164] Though clearly not the king himself, the charioteers are evidently high-status, given their elaborate equipment and the presence of their "third men."

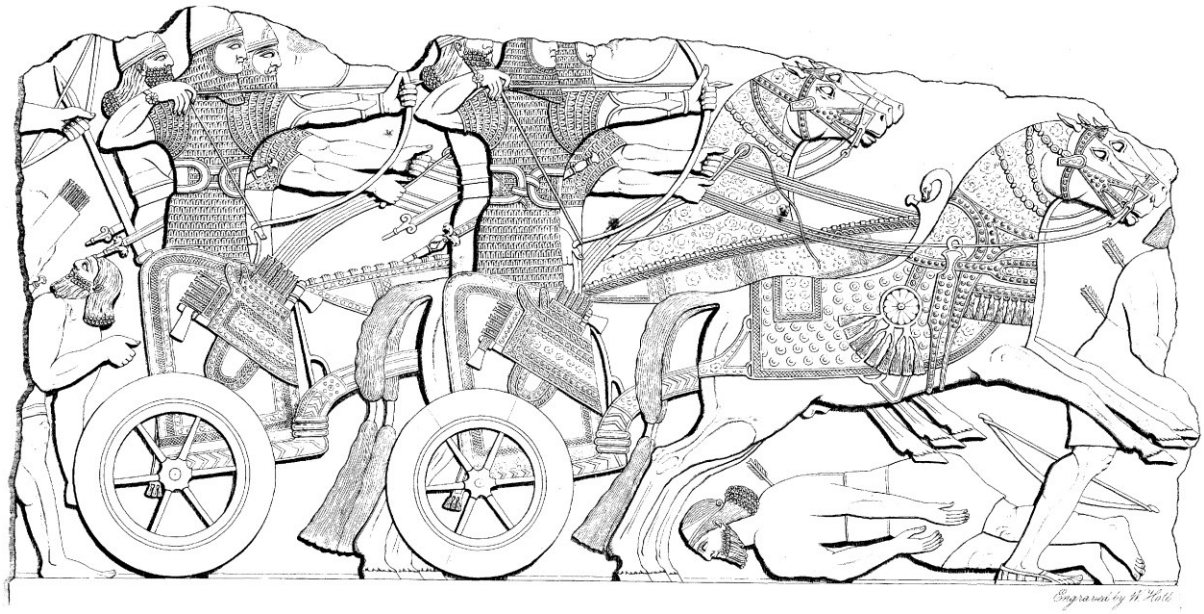

Figure 4.16: Sculpture of Assurnasirpal II showing armored charioteers protected by third men holding shields (the top portions of both shields have been lost in the damaged upper portion of the relief); after Layard 1853a, pl. 28.

Large numbers of chariots are mentioned in the royal inscriptions of Shalmaneser III. In 853 BC, for example, his inscriptions state that his enemies, led by the king of Damascus, brought a total of 3940 chariots against him and were defeated in the Battle of Qarqar.[165] While this number is doubtless somewhat exaggerated, it does imply that at this point, chariots were still a significant military force. The Balawat Gates indicate that the general pattern of extra protection for the king continued in his

1970, no. 55 (p. 26, pl. 16). The two-man chariot riding over dead enemies is also attested outside Assyria, e.g. at Carchemish (Winter 2009d, p. 558, fig. 13), Zincirli (Winter 2009d, fig. 11) and the silver beaker from Hasanlu IVB (Winter 2009c, p. 456, fig. 1b; see Figure 3.22 in this work)

[162] Curtis & Tallis 2008, figs. 21, 27, 37 & 75; note that figs. 21 & 37 are procession scenes, so the third man does not visibly hold a shield as he does in the battle scenes.

[163] Budge 1914, pls. 14 and 18; Barnett & Falkner 1962, pl. 117.

[164] Barnett & Falkner 1962, pl. 116 (a clearer version of the same drawing can be found in Layard 1853a, pl. 28)

[165] Dezső 2012b, p. 63

reign, as they contain many depictions of two-man chariots in combat while the two depictions of 3-man chariots both carry the king.[166]

A mere eight chariots appear in the reliefs of Tiglath-Pileser III,[167] and the single depiction of a chariot in battle from the Central Palace of Tiglath-Pileser III repeats this theme, as it carries the king, a driver and a shieldman (see Figure 4.17).[168] Chariots also do not figure as prominently in the royal inscriptions of Tigath-Pileser III, where exact numbers of chariots were never given, though horses were regularly numbered in the hundreds and even thousands.[169]

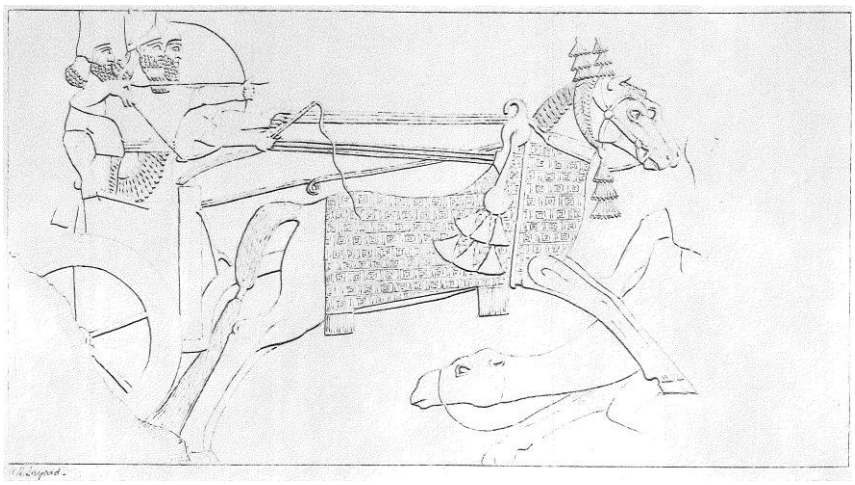

Figure 4.17: Tiglath-Pileser III attacking Arabs in a chariot containing a third man; after Barnett & Falkner 1962, pl. 15.

Chariots appear much more frequently in the reliefs of Sargon II than those of Tiglath-Pileser III,[170] though they appear relatively infrequently and in modest quantities (200 or less) in the royal inscriptions of Sargon II.[171] Nevertheless, a significant change first becomes evident in the reign of Sargon II with the addition of a second shieldman, or by the lone shieldman wielding two shields in battle scenes.[172] Unfortunately, since the state of preservation of the Khorsabad reliefs was very poor, a great deal of detail is missing. One orthostat clearly shows two shieldmen standing behind the king and the driver – their two helmets are clearly visible, and they each hold a large, round shield, one behind the head of the driver and the other held behind the chariot (certainly an artistic convention to more clearly show the occupants of the chariot) (see Figure 4.18).[173] However, in a very similar

[166] King 1915, pls. 9 & 74
[167] Dezső 2012b, p. 65
[168] Barnett & Falkner 1962, pls. 15 & 16
[169] Dezső 2012b, pp. 188-191
[170] Dezső 2012b, p. 66
[171] Dezső 2012b, p. 190
[172] Dezső 2012b, p. 66
[173] Albenda 1986, pl. 116

scene, there is clearly only one shieldman, however two shields are still visible in the same positions as in the aforementioned scene (see Figure 4.19).[174]

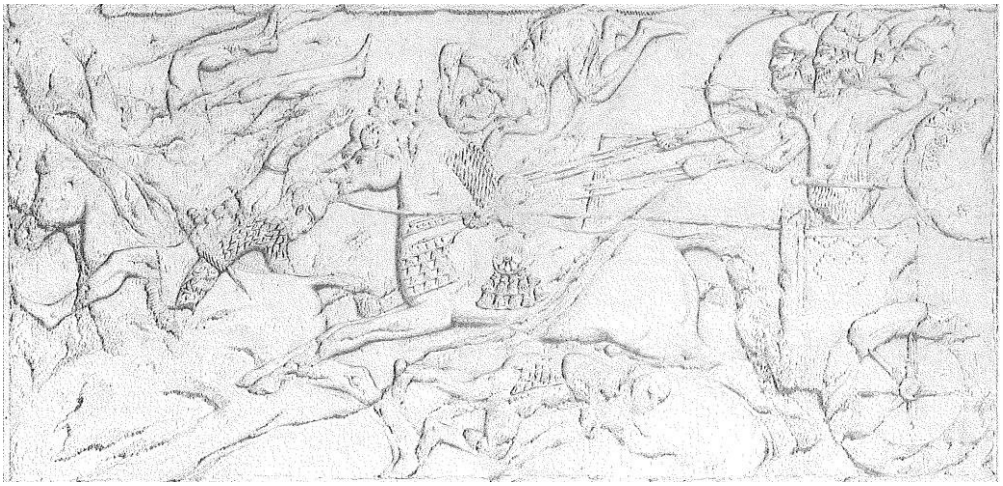

Figure 4.18: Chariot of Sargon II with two shieldmen riding behind the king and driver; after Albenda 1986, pl. 116.

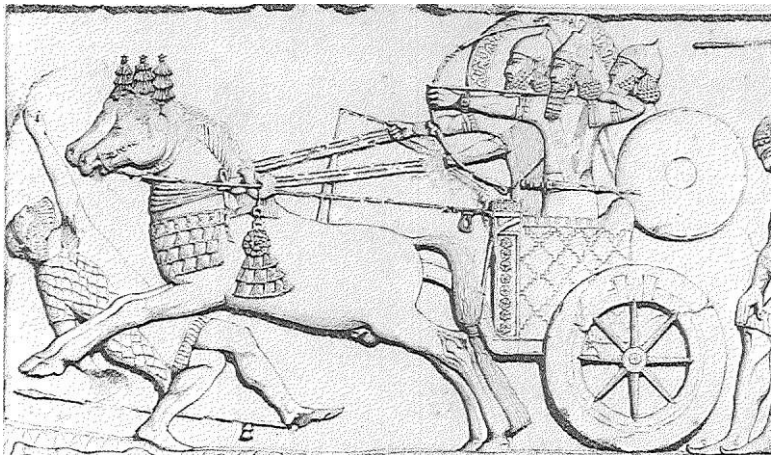

Figure 4.19: Chariot of Sargon II with one shieldman apparently wielding two shields (the outline of one circling the heads of the king and the driver, the second held behind the chariot); after Albenda 1986, pl. 121.

One wonders if the artists omitted the figure of the second shieldman for the sake of clarity, or perhaps simply by mistake, however, we find the same phenomenon in Sargon II 123, where a soldier wearing a conical helmet and his driver are protected by a single shieldman with two shields, again positioned in back of the driver's head and behind the chariot.[175] Not only does this tell us that, as before, the highest degree of protection was not exclusively afforded the king, but is also suggests that

[174] Albenda 1986, pl. 121. Note that a very a similar scene can be found on pl. 117, however the rear area of the chariot has eroded away, so it is impossible to tell if there were originally one or two shieldmen (though Dezső believes it is a single shieldman with two shields; Dezső 2012b, p. 66)
[175] Albenda 1986, pl. 123

shieldmen with two shields were used at least during the reign of Sargon II. Certainly, the use of a single shieldman with two shields would increase protection for no cost in increased weight, however one wonders how effectively a shieldman could use two large shields at the same time. It should be noted that administrative texts concerning chariot crews from the reign of Sargon II number chariot drivers, archers and shieldmen appear in roughly the same quantities,[176] thus if shieldmen were indeed sometimes doubled as the iconography suggests, it was certainly not a universal practice.

The reliefs of Sennacherib from the Southwest Palace do not depict any chariots in battle scenes, however, Sennacherib 44 shows a number of chariots and cavalry in procession, and each chariot carries a single shieldman who holds a single deep-bodied round shield depicted side-on to the viewer (see Figure 4.20).[177] While chariots are mentioned several times in the inscriptions of Sennacherib,[178] their quantities are never given, while the capture of 7200 enemy horses is,[179] indicating again that cavalry had overtaken chariotry (though not completely replaced it) in terms of importance as a weapon of war. Dezső observed that the dearth of chariots in the reliefs and inscriptions of Sennacherib does not mean they had been completely abandoned, but that cavalry was being emphasized over chariotry by that time.[180]

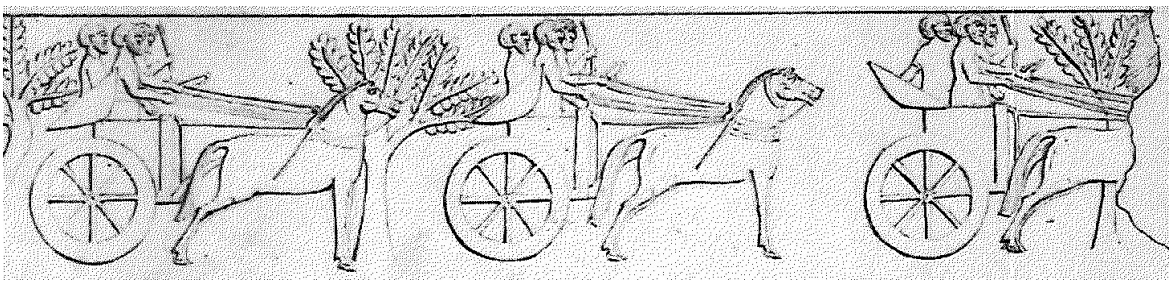

Figure 4.20: Chariots in procession carrying third men holding shields edge-on to the viewer; after Barnett, Bleibtreu & Turner 1998, pl. 44.

Curiously, while depictions of chariots in combat invariably show the chariot warrior fighting with a bow, one passage from the royal inscriptions of Sennacherib includes the phrase, "*a-šar i-kaš-ša-du ú-ra-sa-pu i-na* ^{giš}TUKUL," which Luckenbill translated as, "wherever (my charioteers) met them, they cut them down with the sword."[181] However, the meaning of ^{giš}TUKUL (*kakku*) is more general, and best translated as "weapons,"[182] though its usage does suggest that it primarily referred to hand weapons (for example, as a weapon that was to be worn on the belt, or a weapon that was used to

[176] Postgate 2000, p. 94
[177] Barnett, Bleibtreu & Turner 1998, pl. 44
[178] e.g. Luckenbill 1924, pp. 16, 24, 31, 47, 51, 69, 82, 89, etc.
[179] Dezső 2012b, p. 191-192; Luckenbill 1924, p. 57
[180] Dezső 2012b, p. 67
[181] Luckenbill 1924, p. 47
[182] CAD, Vol. K, pp. 51-52 (*kakku*)

slaughter someone "like a sheep"[183]). In all likelihood, this was merely an example of a somewhat misapplied poetic expression, though it could nevertheless indicate that, while the bow was the principle chariot weapon in combat, hand weapons such as spears and swords may have also been used at times.

The reliefs of Assurbanipal do have several depictions of chariots in action.[184] These chariots appear to be larger and heavier than previously in the period, with wheels almost as high as a man.[185] In most cases, the chariots carry four occupants: driver, archer, and two shieldmen with round shields,[186] though in a few cases, there appears to be only one shieldman.[187] In hunting scenes, however, the two additional charioteers do not serve as shieldmen but rather aid in the hunting with spears or hold the king's bows and arrows.[188]

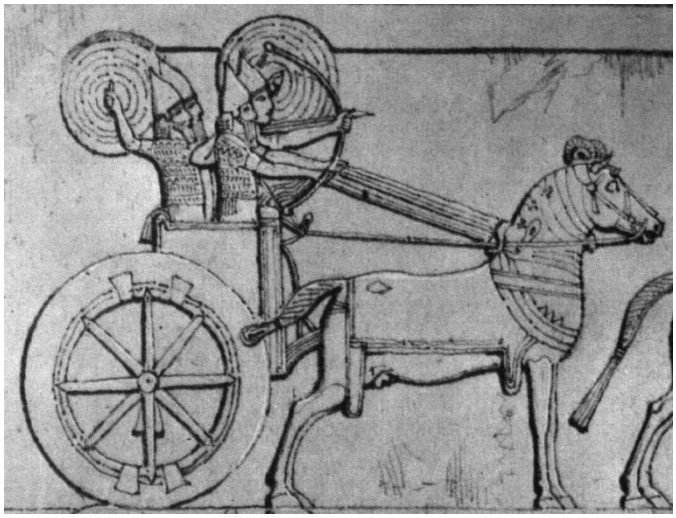

Figure 4.21: Chariot with two shieldmen, from the reliefs of Assurbanipal; after Barnett 1976, pl. 69.

4.2.3. Cavalry

While the chariot seems to have been used in combat exclusively as an archery platform, cavalry – referred to as *pēthallu*[189] and first mentioned in Assyrian sources in the inscriptions of Tukulti-Ninurta II (890-884 BC)[190] - are sometimes shown armed with bows, sometimes with spears, and sometimes with both (wielding spears and with bows slung on their backs).

[183] CAD, Vol. K, p. 51 (*kakku*)
[184] Including one scene from Room XXXIII in the Southwest Palace showing an enemy chariot overturning; Barnett, Bleibtreu & Turner 1998, pl. 291.
[185] Dezső 2012b, p. 68
[186] Barnett 1976, pls. 32, 33, 60, 67 & 69; Barnett, Bleibtreu & Turner 1998, pl. 314
[187] Barnett 1976, pls. 21 & 36?
[188] Barnett 1976, pls. 8, 11, 12 & 56
[189] Fales 2010, p. 118; Dezső 2012b, pp. 28-32
[190] Dezső 2012b, p. 16

In the reliefs of Assurnasirpal II, cavalrymen armed with bows are each paired with another cavalryman armed with sword and shield.[191] The second cavalryman, however, does not use his shield or sword, but rather merely handles the reins of the mounted archer, presumably so that the archer can concentrate on firing his bow (see Figure 4.22). This has led Archer to speculate that the principle impetus in the Assyrian development of cavalry was to create, in effect, a "rough terrain chariot," possessing the same crew and number of horses as a chariot team, but dispensing with the chariot itself and therefore able to cross terrain that a chariot would not be able to manage.[192] When enemy mounted archers are shown, however, they appear to operate independently of one another.[193] On the Balawat Gates of Assurnasirpal II, mounted archers are also paired with a second cavalryman who, in some cases, merely holds the reins of the archer,[194] however in at least one case, holds his shield up to defend the archer (see Figure 4.23).[195]

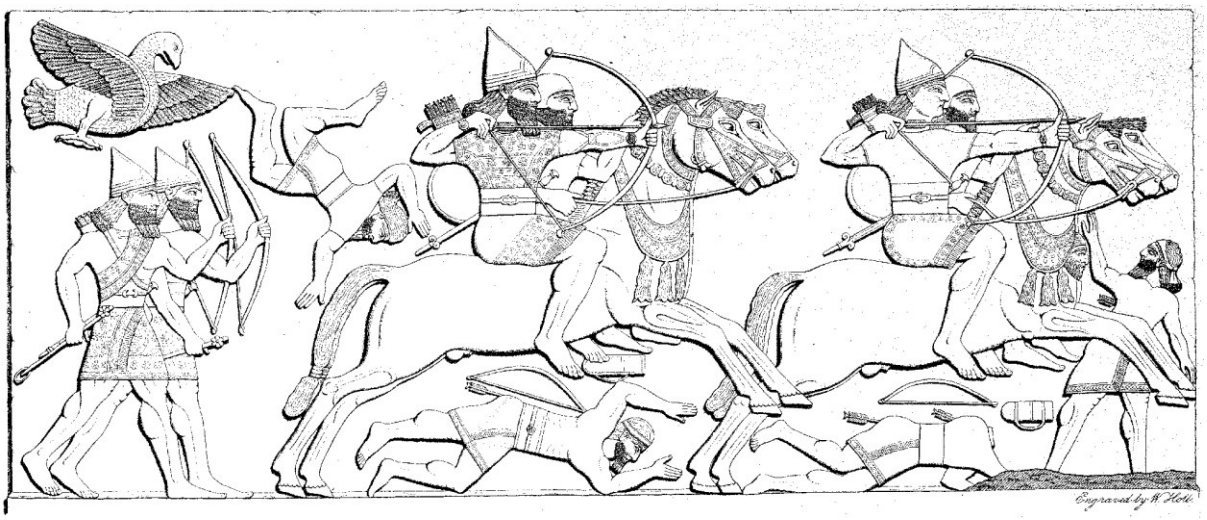

Figure 4.22: Cavalrymen in pairs from the relief of Assurnasirpal II; after Layard 1853a, pl. 26 (drawing of Budge 1914, pl. 15).

[191] Budge 1914, pl. 15
[192] Archer 2010, p. 71
[193] Budge 1914, pl. 24
[194] Curtis & Tallis 2008, figs. 11, 19?, 59 & 86
[195] Curtis & Tallis 2008, fig. 69; see also fig. 35, where the shieldman has his shield slung over his back, as they are not engaged in battle.

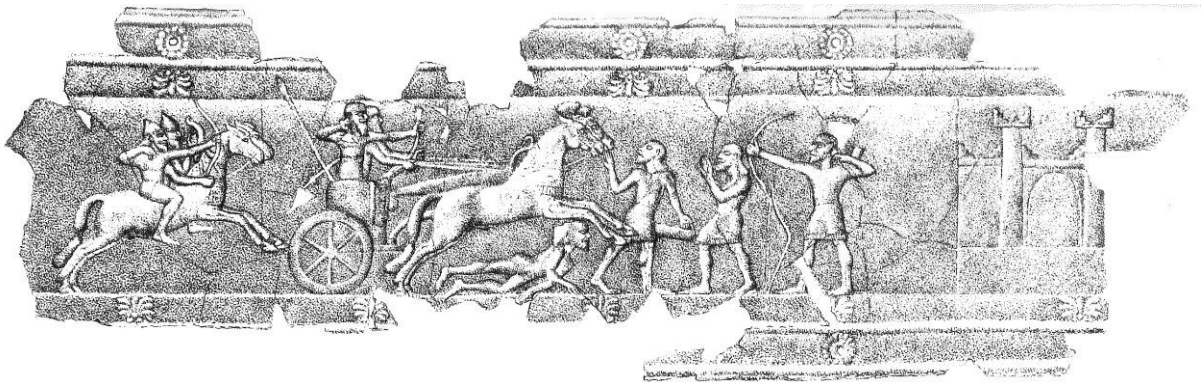

Figure 4.23: Mounted archer paired with mounted shieldman (far left), from gates of the Temple of Mamu at Balawat; after Curtis & Tallis 2008, fig. 70 (drawing of fig. 69).

Mounted archers continue to be paired with shieldmen in the depictions on the Balawat Gates of Shalmaneser III.[196] The detail is not clear enough to make out precisely what is occurring, but it seems that, like in the reliefs of Assurnasirpal II, the second cavalryman is primarily concerned with handling the reins of the archer while he concentrates on shooting. Adding to the evidence that mounted archers and shieldmen worked together is a depiction of a procession with two mounted archers with bows slung on their back followed by a spearman with a spiked shield slung on his back.[197] One new development first attested on the Balawat Gates is that of the multi-purpose cavalryman, armed with both bow and spear. In every case, they are depicted wielding spears while their bows are slung on their backs, and sometimes also carrying a round shield (see Plate 5A).[198]

Neither the paired archer/shieldman combinations nor the multi-purpose cavalry are to be found on the reliefs of Tiglath-Pileser III. There we have only spearmen (who do not carry quivers or bows) who appear to operate in pairs.[199] Dezső observed that the pairing cavalrymen depicted here (e.g. Figure 4.24) could have been an artistic convention merely to suggest large numbers.[200] Since neither acts as rein-holder for the other (thus clearly indicating a pairing), this may well be the case. A seal from Nimrud which appears to depict a cavalry archer performing a "Parthian shot" – firing behind him while galloping forward[201] – may also date roughly to the reign of Tiglath-Pileser III or somewhat before.[202]

[196] King 1915, pls. 7, 38, 48 and 72
[197] King 1915, pl. 57
[198] King 1915, pls. 5, 15, 17 and 55
[199] Barnett & Falkner 1962, pls. 14, 66 & 67. A stele of Tiglath-Pileser III from Anah, now under Haditha Dam reservoir, depicts a pair of cavalrymen, but is so badly weathered that their arms cannot be determined with any certainty, except that none of them appears to be actively wielding a bow; see Cavigneaux & Khalil Ismail 1990, no. 27 (p. 397 & pl. 37)
[200] Dezső 2012b, p. 19
[201] see Rostovtzeff 1943
[202] Parker 1962, p. 34, pl. 16:6 (ND. 6086)

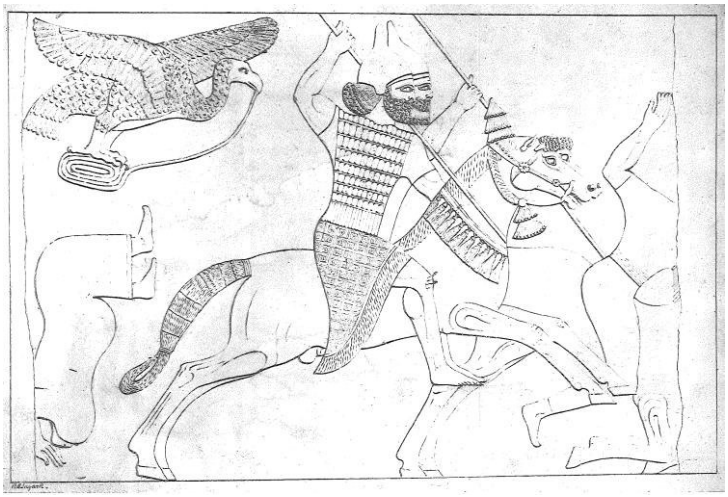

Figure 4.24: Spear-wielding cavalrymen from the reliefs of Tiglath-Pileser III; after Barnett & Falkner 1962, pl. 66.

The quantities of cavalrymen relative to other kinds of soldier depicted on the reliefs of Sargon II is significantly greater than in those of his predecessors (9.4% of soldiers depicted, versus 4.4% under Tiglath-Pileser III[203]). Pairs of spearmen are again very much in evidence, where we most commonly see two overlapping (from the perspective of the viewer) spearmen, one holding his spear overhand and the other holding his underhand (in contrast to earlier reliefs where the overhand grip was almost universal).[204] There are also a couple cases in which one spearman follows the other, rather than being overlapped[205] and a single case of an apparently lone spearman (though a second figure could have been originally present and subsequently eroded away).[206] All of these cavalrymen are depicted wielding their spears,[207] but some of them also carry bows or quivers (see Figure 4.25).[208] Thus we find the same mix of spear-armed and multi-purpose cavalry as in the depictions from Shalmaneser III, which suggests that multi-purpose cavalry may have also existed in the time of Tiglath-Pileser III, but are simply not attested on surviving reliefs.

[203] Dezső 2012b, p. 209, chart 12
[204] Albenda 1986, pls. 94, 95, 101 and 120
[205] Albenda 1986, pls. 102 & 121
[206] Albenda 1986, pl. 99
[207] Albenda 1986, pls. 94?, 95, 101? and 102
[208] Albenda 1986, pls. 102, 120, 121 and 122

Figure 4.25: Multi-purpose cavalrymen from the reliefs of Sargon II, wielding spears but also carrying bows and quivers; after Albenda 1986, pl. 121.

The reliefs of Sennacherib contain an even greater proportion of cavalrymen than those of Sargon II (over 13% of all soldiers depicted)[209]. The reliefs of the Southwest Palace of Sennacherib indicate that the mixture of dedicated mounted archers or spearmen and multi-purpose cavalry continued in his reign. Numerous spearmen with slung bows are depicted leading their horses,[210] and in several cases, riding.[211] However, most scenes showing actual combat show either mounted spearmen who carry no archery equipment[212] or mounted archers,[213] sometimes both in the same scene (see Figure 4.26).

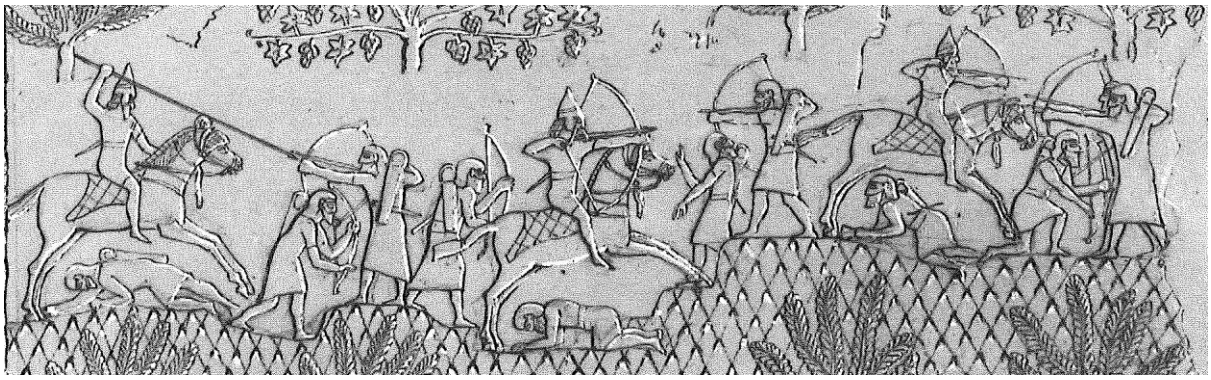

Figure 4.26: Mounted archers and spearmen fighting together in the same battle in the reliefs of Sennacherib; after Barnett, Bleibtreu & Turner 1998, pl. 88.

[209] Dezső 2012b, p. 20
[210] e.g. Barnett, Bleibtreu & Turner 1998 pls. 39, 43, 46, 57, 62, 69, 73, 181, 186, 276, 342, 377, 386, 396, 400, 401, 458, and 507
[211] Barnett, Bleibtreu & Turner 1998, pls. 44 & 60
[212] e.g. Barnett, Bleibtreu & Turner 1998, pls. 44, 80, 85, 89 and 94
[213] e.g. Barnett, Bleibtreu & Turner 1998, pls. 28, 84, 85, 87, 88, 89 & 94

This pattern is continued in the reliefs of Assurbanipal, where we find mounted archers,[214] mounted spearmen,[215] and also a few multi-purpose cavalrymen who carry both spear and bow.[216] Cavalrymen shown in hunting scenes also use both weapons.[217] Dezső considered that cavalry reached their apex in the reign of Assurbanipal (though the proportion of cavalry depicted in relation to other soldiers - 8.6%[218] - was somewhat lower than in the reliefs of Sennacherib), since at this point even some their horses are depicted as having armor (which Dezső speculated was made of leather; see Figure 4.27).[219]

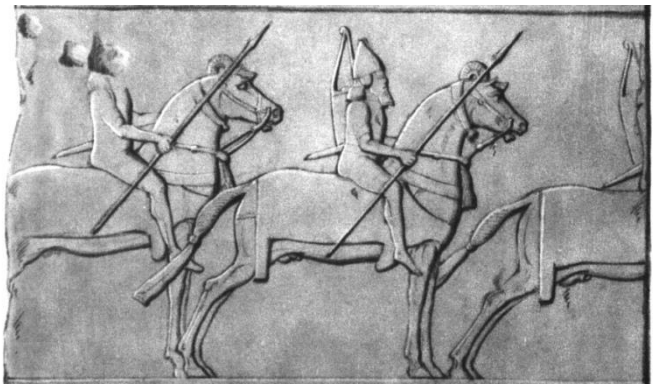

Figure 4.27: Multi-purpose cavalryman carrying both bow (in a bow case) and spear, from the reliefs of Assurbanipal; after, Barnett 1976, pl. 70.

4.2.4. Infantry

Infantry appears in textual sources throughout the Neo-Assyrian Period, referred to by a number of terms including, *zūku* (or *zūk šēpē*),[220] ERIM.ḪI.A.MEŠ (*ṣābu*[221] or, more likely, *ummānu*[222]), and *kallāpu*.[223] They were further divided into groups based on the arms they bore, sometimes even being referred to simply by the name of their weapon,[224] as in one muster list that enumerates 350 shields (shieldmen) and 240 bows (archers).[225] The standard expressions for archers, however, were *ṣābē*

[214] Barnett 1976, pls. 16, 25, 33, 34, 36, 60, 67 & 69; Barnett, Bleibtreu & Turner 1998, pls. 199, 206, 292 & 296
[215] Barnett 1976, pls. 17, 21, 23, 32, 33 & 34
[216] Barnett 1976, pls. 20, 34 & 70; Barnett, Bleibtreu & Turner 1998, pls. 259 & 262
[217] Barnett 1976, pls. 46, 47, and 52
[218] Dezső 2012b, chart 12 (p. 208-209)
[219] Dezső 2012b, p. 21
[220] Dezső 2012a, p. 57
[221] Malbran-Labat 1982, p. 77
[222] Dezső 2012a, p. 57
[223] Translated variously as "courier," "mounted scout,' 'light infantry,' or, after Postgate, a kind of armored spearman; Dezső 2012a, p. 60; Postgate 2000, pp. 104-105; Malbran-Labat 1982, pp. 82-83; Dalley & Postgate 1984, p. 34; De Backer 2013, p. 116
[224] Malbran-Labat 1982, p. 81
[225] SAA XI 127, 1-2; see also SAA XI 128

qāšti (LÚ.ERIM.MEŠ.^{giš}BAN),[226] *māhiṣu* or *mušezibu*, though their precise meaning (whether "archer" in general or a more precise type of archer) is uncertain.[227]

Several studies of the Assyrian military have divided archers (and infantrymen in general) into "heavy," "regular," and "light" groups based on their equipment.[228] "Heavy" archers wear pointed or occasionally hemisperhical helmets and wear body armor,[229] while "regular" archers wear only pointed helmets and no armor,[230] and "light" archers wear no armor of any kind (and generally appear to be non-Assyrians).[231] Because of the difficulty in assigning precise definitions to the various terms for infantrymen in the Neo-Assyrian Period (see above), it is impossible to determine if the Assyrians themselves made such a categorical distinction between archers based on their equipment, or whether these interpretations are perhaps too heavily influenced by more modern military history where such distinctions based on "weight" (lighter being more mobile while heavier being less mobile) were explicitly made.[232]

Infantrymen are ubiquitous in Neo-Assyrian reliefs, appearing in nearly every context, and a large proportion of them are archers. In battle scenes, they sometimes are shown operating in conjunction with a shieldman or behind a siege shield, though they also sometimes operate without the benefit of any shieldman at all.

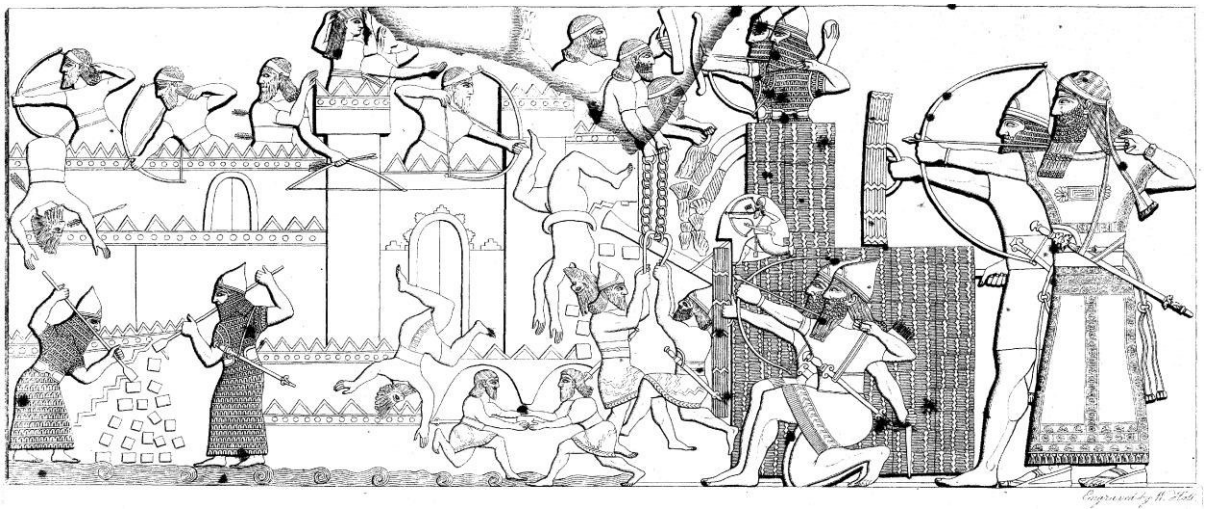

Figure 4.28: Attack on a city, including foot archers, from the reliefs of Assurnasirpal II; after Layard 1853a, pl. 19 (drawing of Budge 1914, pl. 24).

[226] Which may have referred specifically to auxiliary, regular, or armored archers; Dezső 2012a, pp. 83-85
[227] Dezső 2012a, p. 85
[228] Malbran-Labat 1982, p. 77; Dezső 2012a, pp. 23-24; De Backer 2013, pp. 124-130
[229] Dezső 2012a, p. 99-107
[230] Dezső 2012a, p. 53-56
[231] Dezső 2012a, pp. 25
[232] e.g. the "light" versus "line" infantry of the Napoleonic French army; see Fremont-Barnes & Fisher 2004, pp. 27-28

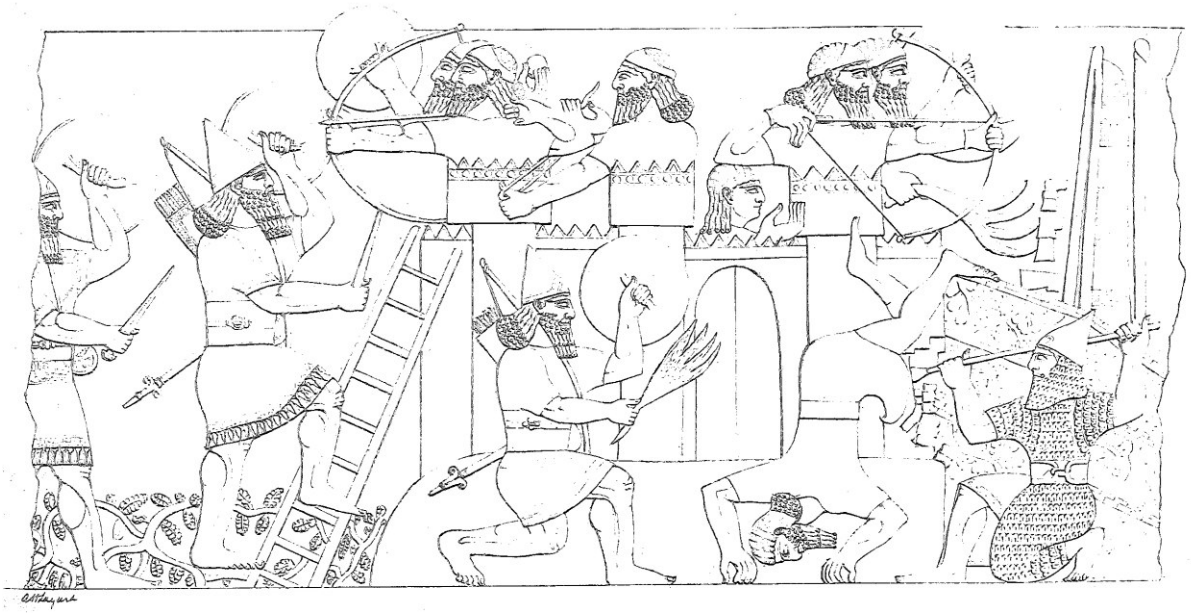

Figure 4.29: A multi-purpose infantryman (armed with bow as well as sword and shield) climbs a ladder to attack a city, from a relief of Assurnasirpal II re-used in the Southwest Palace; after Barnett & Falkner 1962, pl. 118.

In the reliefs of Assurnasirpal II, infantry archers are principally shown attacking cities[233] (a theme also attested on the fragmentary Rassam Obelisk[234]), though one one scene, officers holding bows and maces follow cavalry in a field battle (see Figure 4.22).[235] The king is also shown fighting on foot with his bow against cities.[236] There is a single example of a multi-purpose infrantryman,[237] who carries sword and shield, but also has a bow over his shoulder and a quiver slung across his back (see Figure 4.29).[238] This may suggest that the multi-purpose cavalryman (see §4.2.3), first attested on the Balawat Gates of Shalmaneser III, was a development from infantrymen. Enemy archers are typically shown on foot,[239] though there is one example of mounted enemy archers.[240]

The Balawat Gates of Assurnasirpal II share these themes, with Assyrian foot archers attacking cities,[241] as does the king,[242] and enemy archers shown on foot[243] (or in cities[244]). There are several cases where some enemy archers are apparently surrendering in the face of an advancing Assyrian

[233] Budge 1914, pls. 13, 18, 23 & 24
[234] Reade 1980a, pl. 4
[235] Budge 1914, pl. 15
[236] Budge 1914, pls. 13 & 23
[237] Called a "*par excellence* regular infantryman" by Dezső; Dezső 2012a, p. 61
[238] Barnett & Falkner 1962, pl. 118
[239] Budge 1914, pls. 13, 14, 15, 18 & 24
[240] Budge 1914, pl. 24
[241] Curtis & Tallis 2008, figs. 11, 75 & 86
[242] Curtis & Tallis 2008, fig. 75
[243] Curtis & Tallis 2008, fig. 9, 19, 25, 28 & 69
[244] Curtis & Tallis 2008, figs. 11, 75 & 86

chariot while the archer farthest from the chariot fires back towards it (see Figure 4.9).[245] It is not clear if the firing archers are enemies aiming at the chariot or an Assyrian aiming at the surrendering enemies between him and the chariot, akin to hunting scenes from the same Balawat Gates showing the hunted animals trapped between the king in a chariot and a foot archer (see Figure 4.8).

The Balawat Gates of Shalmaneser III introduced a new idiom, where large numbers of archers are lined up outside a city, firing at it (see Plate 5B).[246] Foot archers also appear in field battles (or massacres), albeit less commonly.[247] Multi-purpose infantrymen, armed with bow and sword, are normally engaged in slaughtering defeated enemies.[248] Enemy archers are limited to firing from besieged cities.[249]

As Yadin observed,[250] in the reigns of Assurnasirpal II and Shalmaneser III, Assyrian archers often wore long armor coats and were typically accompanied by a shieldman who used a small round shield to further protect the archer (e.g. Figure 4.28, figures in siege tower). Nevertheless, there are still numerous depictions in both the Northwest Palace reliefs of Assurnasirpal II[251] and the Balawat Gates of Shalmaneser III[252] of both unarmored and armored archers in action without the aid of shieldmen.

Yadin speculated that the weight of the armor made it difficult for the archers to move, and for this reason it was abandoned in favor of large siege shields, behind which the archers could take shelter even very close to the walls of a city under attack.[253] While this may be a reasonable supposition, it would be equally reasonable to consider that supplying archers with an ankle-length coats of armor would have been significantly more costly for the Assyrian state than to supply them with waist-length armor coats or with no armor at all. It should also be noted that, whatever impact the long armor coats had in terms of mobility (which, arguably, could be easily overstated), the use of siege shields would have necessarily significantly limited the mobility of the archers using them. A scene from the Balawat Gates of Shalmaneser III depicts archers in long coats of armor taking part in the storming of a city (see Plate 5C), [254] which would not have been possible had they been forced to remain behind siege shields.

[245] Curtis & Tallis 2008, figs. 9, 27, 69?
[246] King 1915, pls. 2-3, 8-9, 20-22, 43-44, 50-51, 52-53, 67-71, 74-75 & 77
[247] King 1915, pls. 10 & 40
[248] King 1915, pls. 38, 40 & 42
[249] King 1915, pls. 9, 44, 50, 69 & 70
[250] Yadin 1963, p. 295
[251] e.g. Budge 1914, pl. 13
[252] e.g. King 1915, pls. 20-22, 43-44, 73-77
[253] Yadin 1963, p. 295
[254] King 1915, pl. 73

In addition to the small, round shields mentioned by Yadin, shieldmen protecting archers are also shown using large, rectangular shields, often textures to suggest that they were made from woven reeds or a similar material[255] (e.g. Figure 4.28, figures on far right) in the reigns of both Assurbanipal II[256] and Shalmaneser III.[257]

A single possible attestation of a siege shield appears on the Balawat Gates of Shalmaneser III (see Plate 5C),[258] though it is missing the angled top of the fully-developed siege shield. Such shields, with tops angled at 90 degrees, are first attested in the reliefs of Tiglath-Pileser III (see Figure 4.30).[259] The siege shields are held by a shieldman who also typically wields a short sword or dagger. In some cases, two archers (with or without armor) take shelter behind a single siege shield,[260] however more often the siege shield protects a single shieldman and archer.[261] Desző suggested that the archers protected by siege shields may have been high officials whose rank warranted extra protection,[262] yet even among these individuals, some are afforded greater protection than others. In one instance, a single beardless archer is protected by both a siege shield and a shieldman holding a regular round shield.[263] A second archer is afforded exceptional protection in yet another scene, where he is flanked by two shieldmen holding round shields high.[264]

Archers are also shown in action without the protection of shieldmen. In two cases, a pair of archers follows a pair of spear men with shields, though the latter are attacking enemies rather than defending the archers.[265] This may suggest that, when deployed, archers were sometimes paired with a shieldman (who may be armed with spear or sword), though there is a third comparable scene where two archers follow a single shield-bearing spear man.[266] Enemy archers are not shown fighting with the aid of shieldmen.[267] The reliefs of Tiglath-Pileser III also see the introduction of the non-Assyrian "auxiliary" archer,[268] possibly Itu'eans or other Aramaean tribesmen,[269] who are generally

[255] Several shields dating to the 3rd Century AD found at Dura-Europos appear very similar to those depicted in the reliefs. They are constructed of wooden sticks threaded through holes pierced in a rawhide sheet; James 2004, pp. 186-187.
[256] e.g. Budge 1914, pls. 23 & 24
[257] e.g. King 1915, pls. 67-71
[258] King 1915, pl. 73
[259] One exception is Barnett & Falkner 1962, pl. 54, which has a curved top.
[260] Barnett & Falkner 1962, pls. 10 & 11
[261] Barnett & Falkner 1962, pls. 39, 52, 54, 62, 72-77
[262] Dezső 2012a, p. 83
[263] Barnett & Falkner 1962, pl. 31
[264] Barnett & Falkner 1962, pl. 48
[265] Barnett & Falkner 1962, pls. 41 & 50
[266] Barnett & Falkner 1962, pl. 35
[267] Barnett & Falkner 1962, pls. 10 & 33
[268] Barnett & Falkner 1962, pl. 50; plates 35 & 41 may also show auxiliary archers, since they are armed only with bows and are operating in conjunction with non-Assyrian spearmen (wearing crested helmets and small circular breastplates), however they wear short tunics instead of the kilt more usual for auxiliaries.
[269] Dezső 2012a, pp. 32-38

distinguished by wearing a kilt and headband bearing a geometric design, and often a broad baldric.[270] They wear no armor and are armed only with a bow and sometimes also a short sword (hung from the aforementioned baldric).

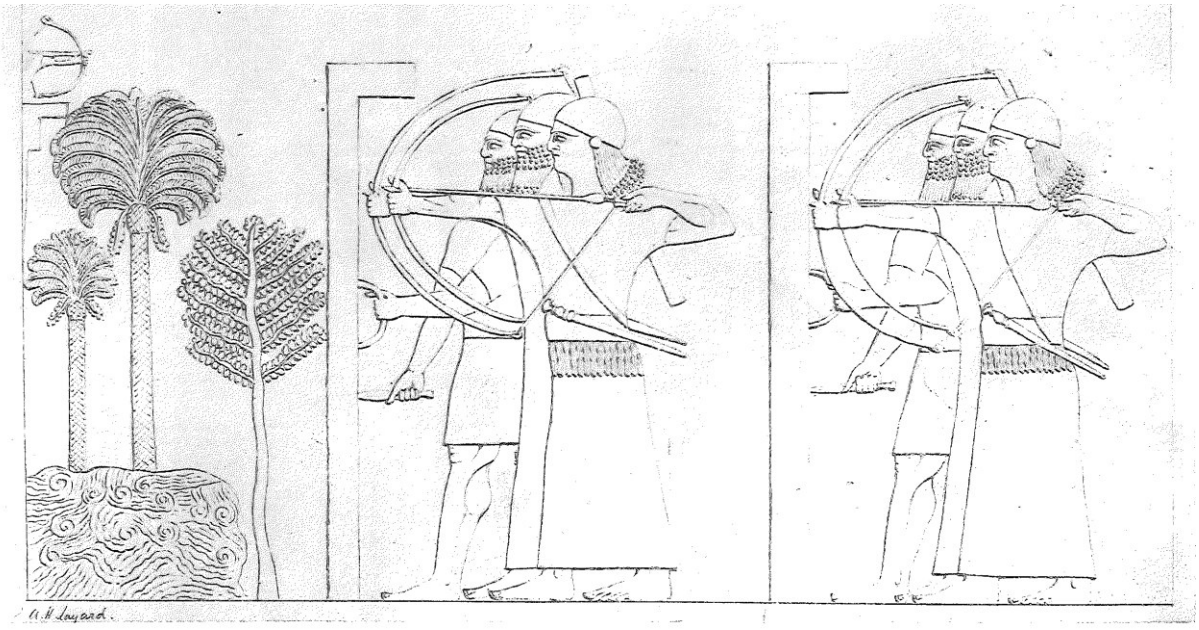

Figure 4.30: Archers shelter behind siege shields with angled tops, from the reliefs of Tiglath-Pileser III; after Barnett & Falkner 1962, pl. 11.

In the reliefs of Sargon II, the siege shields take on a more life-like appearance, with wider bottoms and curved, rather than sharply angled, tops (see Figure 4.31). As in the reliefs of Tiglath-Pileser III, archers are typically only shown in combat in city attack scenes, and shieldmen with siege shields are frequently shown paired with archers.[271] Still, there are numerous cases of archers paired with shieldmen who wield small, round shields.[272] In several cases, archers are protected both by a siege shield in front and a shieldman holding a round shield behind (see Figure 3.25).[273] Archers with no shieldman at all are also widely attested,[274] as are auxiliary archers who never fight in conjunction with shieldmen.[275]

[270] Henshaw 1969, p. 8
[271] Albenda 1986, pls. 94, 96, 100, 102, 107, 112, 119, 124 & 136
[272] Albenda 1986, pls. 94, 100, 102, 107, 112, 119, 124 & 138
[273] Ambenda 1986, pls. 102 & 118
[274] Albenda 1986, pls. 95, 98, 100, 101, 102, 119, 124, 128, 136 & 138
[275] Albenda 1986, pls. 95?, 98, 101?, 102, 119, 124, 128 & 136

Figure 4.31: Amored archers attacking a city while protected by siege shields and conventional round shields, from the reliefs of Sargon II; after Albenda 1986, pl. 94.

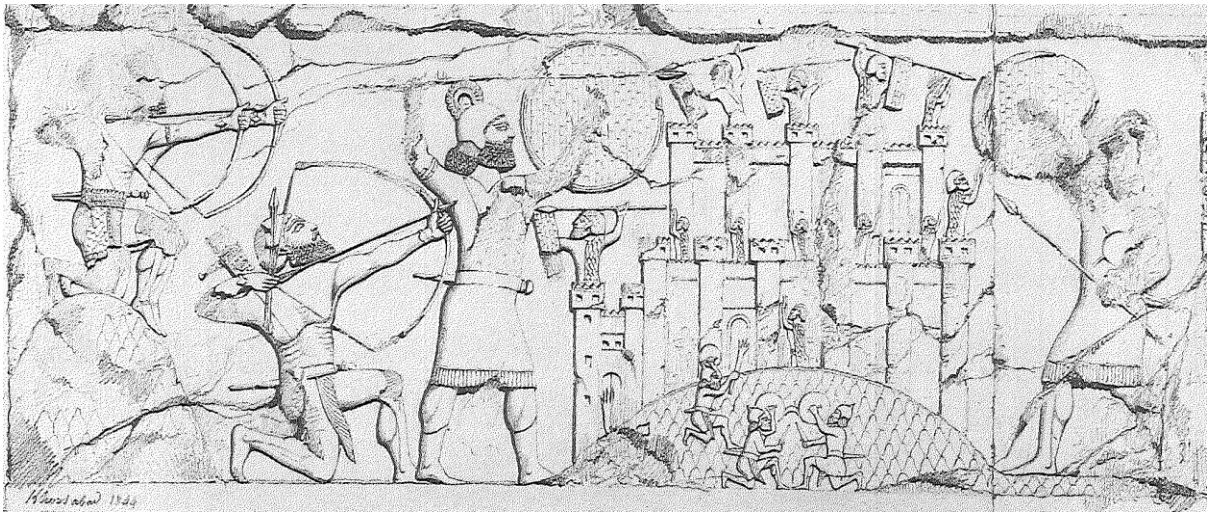

Figure 4.32: "Auxiliary" archers and spearmen attacking a city together, from the reliefs of Sargon II; after Albenda 1986, pl. 128.

There is no clear visual distinction between the archers protected by siege shields, normal shields, or no shields at all. It does not appear to directly relate to the status or wealth of the archers in question, since archers in all these circumstances are sometimes shown wearing armor.[276] The only clear pattern is that non-Assyrian "auxiliaries," (who are never shown wearing armor and who typically wear a distinctive kilt with a stepped pattern) are never defended by shieldmen of any kind. Sometimes, however, they do appear to be fighting alongside non-Assyrian spearmen who wear crested helmets and small, circular breastplates[277] (see Figure 4.32 and Figure 3.33).[278]

[276] e.g. Albenda 1986, pls. 94, 100 & 102, where archers defended by siege shields and regular shields both wear armor corselets and pl. 95, where a further armored archer has no shield man at all.
[277] Perhaps identified by the Akkadian term *irtu* ; see De Backer 2011, p. 8 & CAD, Vol. I, p. 187 (where it is translated as "pectoral").
[278] e.g. Albenda 1986, pls. 95, 124, 128 & 136

As with previous reliefs, archers shown in combat on the reliefs of Sennacherib are nearly always engaged in attacking cities.[279] The lines of archers arrayed outside of cities and firing at them, first attested in the Balawat Gates of Shalmaneser III, return in the reliefs of Sennacherib, sometimes to a much greater extent (such as at the capture of Lachish, see Figure 4.33).[280]

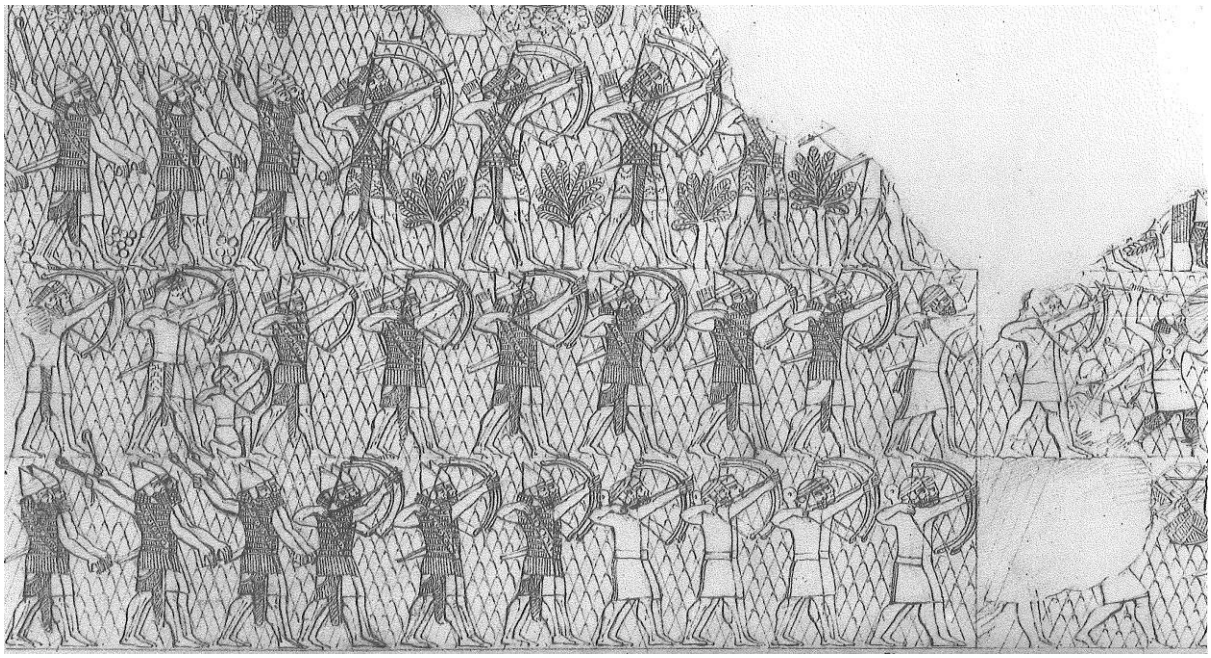

Figure 4.33: Lines of archers firing at Lachish, from the reliefs of Sennacherib; after Barnett, Bleibtreu & Turner 1998, pl. 324.

The reliefs of Sennacherib continue to depict archers paired with shieldmen holding realistically-depicted siege shields[281] or smaller hand-held shields.[282] Again, there is a single example where one archer is protected by both a siege shield and a smaller hand-held shield.[283] Some archers also continue to operate without the aid of a shieldman. Some of these are Assyrians (usually wearing armor),[284] but they are principally non-Assyrian auxiliaries (with no armor or helmets).[285] Enemies are shown not only firing from city walls,[286] but also firing at Assyrian cavalry during field battles[287] and from boats at attacking Assyrians in the marshes of Babylonia.[288]

[279] Among the few exceptions are archers fighting alongside spearmen in a field battle (Barnett, Bleibtreu & Turner 1998, pl. 36) and archers firing from boats furing a battle in the Babylonian swamps (Barnett, Bleibtreu & Turner 1998, pl. 454).
[280] Barnett, Bleibtreu & Turner 1998, pls. 55, 68?, 71-72, 164-170, 269-270, 275, 324-328, 332, 381?, 456-457 & 471
[281] Barnett, Bleibtreu & Turner 1998, pls. 54, 55, 68, 71, 72, 152, 164, 166, 168, 170, 182, 184, 269, 328, 330, 332, 375, 381, 457, 471 & 511
[282] Barnett, Bleibtreu & Turner 1998, pls. 270 & 272
[283] Barnett, Bleibtreu & Turner 1998, pl. 152, uppermost archer
[284] Barnett, Bleibtreu & Turner 1998, pls. 36?, 137, 269, 270, 272, 324, 328, 330 & 332
[285] Barnett, Bleibtreu & Turner 1998, pls. 36, 54, 55, 64, 152, 166, 170, 184, 270, 272, 275, 283, 324, 328, 330, 332, 375, 457 & 471
[286] Barnett, Bleibtreu & Turner 1998, pls. 64, 66, 168, 270, 272, 324, 330 & 332

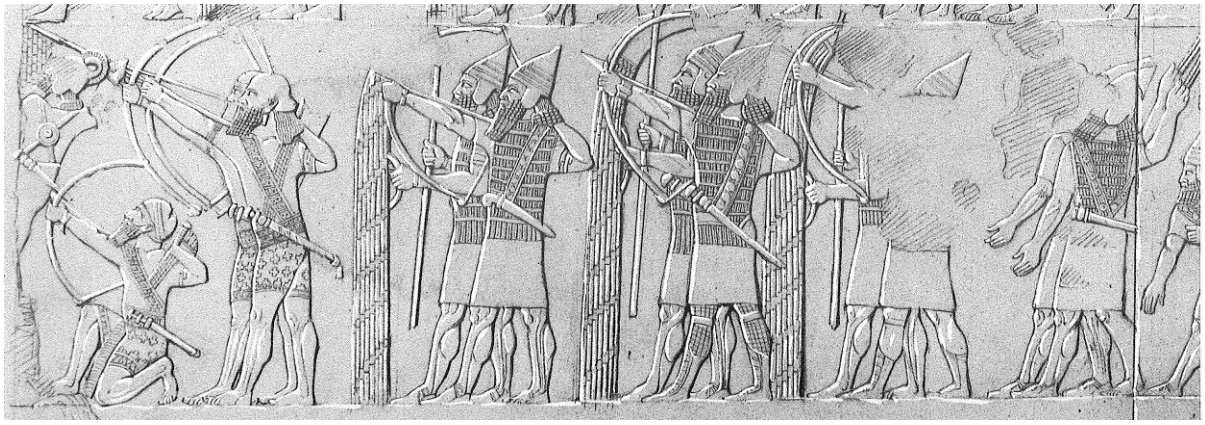

Figure 4.34: Archers firing from behind siege shields, while "auxiliary" archers fire in front of them and slingers behind them, from the reliefs of Sennacherib; after Barnett, Bleibtreu & Turner 1998, pl. 457.

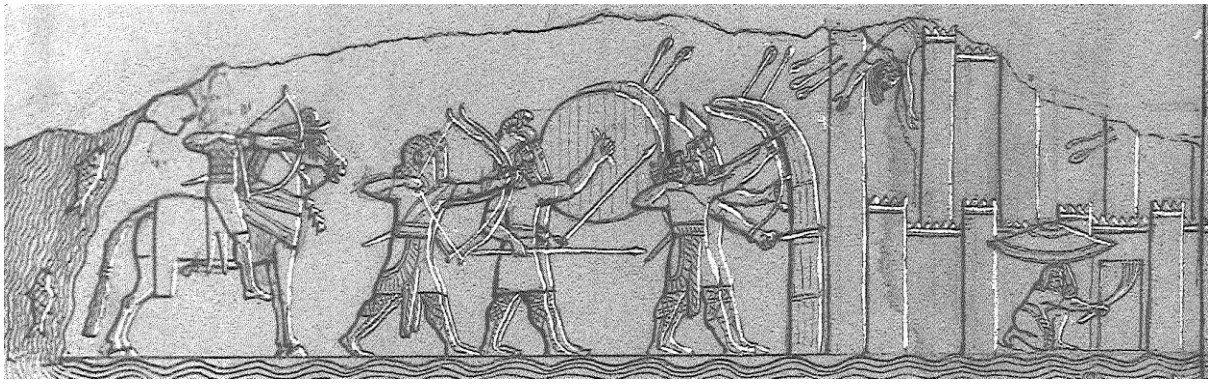

Figure 4.35: Archers attacking a city, defended by a siege shield in front and followed by a second shieldman with a round shield and two more archers, from the reliefs of Assurbanipal in the Southwest Palace; after Barnett, Bleibtreu & Turner 1998, pl. 206.

While, on the whole, the reliefs of Sennacherib follow the pattern of those of Sargon II, there is one significant development: the introduction of slingers into depictions of the Assyrian military. Slingers are never shown paired with shieldmen (though sometimes they stand just behind archers who are), which may argue that they were regarded as less important than archers, however they are also invariably depicted wearing armor and helmets.[289]

[287] Barnett, Bleibtreu & Turner 1998, pls. 84-89, 92-94, 130 & 137
[288] Barnett, Bleibtreu & Turner 1998, pl. 454
[289] Barnett, Bleibtreu & Turner 1998, pls. 42, 72, 324, 330, 332, 375, 403, 457 & 458

Figure 4.36: An archer taking part in a field battle along with spearmen and cavalrymen, from Assurbanipal's reliefs in the North Palace; after Place 1867, pl. 61 (detail of Barnett 1976, pl. 34).

The reliefs of Assurbanipal generally follow these patterns as well. Though there are several examples of archers taking part in field battles (see Figure 4.36),[290] they are most often depicted attacking cities while protected by siege shields,[291] sometimes lined up outside the city walls,[292] though never to the extent depicted in the reliefs of Sennacherib. In the reliefs of the Southwest Palace, a second shieldman holding a round shield sometimes helps defend the archers behind the siege shield (see Figure 4.35), [293] and in at least one case, provides the sole defense for an archer.[294] Archers often also fight without the benefit of shieldmen of any kind (generally while climbing ladders up city walls, unless they are auxiliaries).[295] Slingers are also still employed,[296] as are auxiliary archers, though they are far less evident than in the reliefs of Sennacherib.[297] Enemy archers are shown fighting from city walls[298] as well as in field battles (both on land[299] and in marshes[300]).

The common pairing of archers with shieldmen in iconographic depictions may suggest that the Assyrian military recruited roughly equal numbers of them in order to facilitate this pairing. However, administrative texts show that this is not the case. For example, the "Turtanu of the Left" of Sargon II had under his command 20,000 archers but only 10,000 shieldmen.[301] Furthermore, it appears that archers and shieldmen were administered separately. A Neo-Assyrian muster roll shows that small units of archers and shieldmen had their own respective commanders,[302] thus at least at the

[290] Barnett, Bleibtreu & Turner 1998, pls. 288, 292 & 296; Barnett 1976, pls. 34 & 68
[291] Barnett, Bleibtreu & Turner 1998, pls. 191, 199, 203 & 206; Barnett 1976, pls. 16, 21, 36, 67? & 71
[292] Barnett, Bleibtreu & Turner 1998, pls. 191 & 206; Barnett 1976, pls. 16, 21, 22 & 36
[293] e.g. Barnett, Bleibtreu & Turner 1998, pls. 191, 203 & 206
[294] e.g. Barnett, Bleibtreu & Turner 1998, pl. 191
[295] e.g. Barnett 1976, pls. 17, 21, 28, 60 & 61
[296] e.g. Barnett, Bleibtreu & Turner 1998, pl. 199; Barnett 1976, pls. 16 & 21
[297] Barnett, Bleibtreu & Turner 1998, pls. 288 & 296; Barnett 1976, pls. 16?, 21, 23?, 60, 67 & 72
[298] Barnett, Bleibtreu & Turner 1998, pls. 199 & 208; Barnett 1976, pls. 17 & 21
[299] Barnett, Bleibtreu & Turner 1998, pl. 296; Barnett 1976, pls. 25 & 32
[300] Barnett, Bleibtreu & Turner 1998, pl. 236; Barnett 1976, pl. 16
[301] Dezső 2006, p. 126
[302] SAA XI 128, 8-r12

lower levels of the command structure of the Assyrian army, archers and shieldmen were administered separately and consequently the operation of shieldmen with archers was not simply an artifact of the organization of the Assyrian military. We must therefore recognize that while bureaucratic texts show the administrative organization of the military, reliefs show (as far as they can be relied upon) the actual deployment of Assyrian soldiers.

4.2.5. Distribution of Archery Equipment

The mechanism for the distribution of archery and other military equipment in the Neo-Assyrian military is poorly attested.[303] There was certainly a considerable degree of centralization. For example, a list of valuables in a letter from an official from Kumme to Sargon II lists hundreds of bronze quivers,[304] which indicates that the Assyrian state stored and presumably distributed them in a centralized manner.

While some military equipment was obtained as plunder or tribute,[305] much of the equipment used by the Assyrian military must have been manufactured for its use. The king certainly distributed raw materials to craftsmen in order to have objects made, as one text mentioning the theft of iron by royal blacksmiths indicates.[306] Rooms that appear to have functioned as workshops in royal arsenal (*ekal māšarti*) at Nimrud[307] indicate that at least some production or repair of military gear was carried out in a centralized fashion. Nevertheless, a letter discussing the provisioning of a new fortress in northern Babylonia mentioned thirty bows and a vast quantity of arrows – 10,000 arrow shafts and 20,000 aparently complete arrows.[308] The fortress was provisioned by the "magnates" (LU_2.GAL.MEŠ, *rabiūti*[309]) of the city, thus presumably either local craftsmen were hired to produce the arrows or they were purchased from elsewhere. Provincial governors were tasked with supplying food for the army when it was in their provinces,[310] and they may have likewise been required to provide other expendible supplies, such as arrows, when the army was on the move.

The enormous quantities of arrows consumed by a single fortress shows that keeping archers supplied with ammunition was doubtless a major concern for the Assyrian military. In the 2nd Millennium BC, Šamši-Adad I ordered 10,000 arrows for his archers, and Hamblin observed that this order would

[303] Meyer 2002, p. 15
[304] SAA V 101, r4 – the exact multiple of 100 is unknown since the numeral is lost in a break.
[305] e.g. Hezekiah's tribute to Sennacherib; RINAP III, Sennacherib 4, 55-58
[306] SAA I 179, 22-23
[307] Mallowan 1966, pp. 405-406
[308] SAA XV 166, 6-15
[309] The term LU_2.GAL.MEŠ was used for provincial governors and other high officials after whom eponyms were given, see Dalley & Postgate 1984, p. 171.
[310] Meyer 2002, p. 15

equip 500 archers with 20 arrows each.[311] An experienced archer could fire all 20 of those arrows in under two minutes.[312] Given the large number of archers in the Assyrian army – administrative texts regularly mention them by the hundreds[313] and thousands[314] - the vast quantity of arrows necessary for military activities becomes evident.

Arrows can be re-used after having been fired, but there were doubtless many cases where retrieving arrows was impractical, and even when an arrow was retrieved, it may have been damaged and require repair. Thus, arrows must have been considered expendable on the whole, and keeping the archers supplied with arrows must have been a major cost of campaigning. Certainly, at the time of Šamši-Adad I, equipping archers was a costly business. Twenty arrows cost one shekel of sliver (though whether that was the complete arrow or simply the arrowhead is not stated), while ten ordinary soldiers were together paid 2-3 shekels for service in a campaign.[315] Thus a single archer would carry in his quiver (and be able to shoot off in a very short time) arrows worth the pay for three to five ordinary soldiers for the entire campaign.

The cost of equipping archers was perhaps one reason that archers play such a prominent role in Assyrian reliefs. Assyrian power was emphasized by showing that they had the resources to field large numbers of archers, a feat that poorer nations would be less able to achieve.

4.3. Conclusions

Royal hunting played a significant role in Assyrian ideology from the late 2nd Millennium BC through the end of the period, though there does appear to be a lull in both iconographic representations and textual descriptions of royal hunts between the reigns of Shalmaneser III and Assurbanipal. The reason for this lull is not clear. It does not appear to be an artifact of the sample available, since Sennacherib had very extensive reliefs which nevertheless lack hunting scenes. A possible explanation is that Assurbanipal was deliberately harkening back to an old, obsolete motif, perhaps due to his well-attested interest in Mesopotamian antiquities,[316] or perhaps out of a desire to clearly differentiate his iconography from that of Sennacherib. He lived in the Southwest Palace, surrounded by the reliefs of his grandfather (Sennacherib), for the early part of his reign,[317] and that may have

[311] Hamblin 2006, pp. 254-255; 20 arrows is a reasonable estimate of the number of arrows an archer would carry – SAA XI 169, r12, mentions an exile possessing a bow and 20 arrows, while an Urartian text lists 16 archers, each armed with a bow and between 20-30 arrows; see Findling & Muhle 2012, p. 397.
[312] see Miller *et al* 1986, p. 188
[313] SAA XI 127, 2 (240 archers); SAA XVIII 125, r25 (300 archers)
[314] SAA XVII 70, 4 (1,000 and 20,000 archers)
[315] Hamblin 2006, p. 255
[316] Assurbanipal, for example, ordered copies of all ancient tablets to be made and sent to him in Nineveh; Mallowan 1966, p. 274.
[317] Barnett 1976, p. 2

encouraged him to come up with different themes for his own North Palace, out of the common desire for Assryian kings to out-do their predecessors (see §3.1).

The royal hunt, which generally focuses on the king hunting bulls or lions, has several layers of ideological significance, from stressing the king's manly prowess and bravery to symbolizing the triumph of civilization in the form of the king over the forces of nature, symbolized principally by the lion. In a number of cases, however, this ideological message appears to be somewhat undermined by other Assyrians (some clearly high-status, others not) taking part in royal lion and bull hunts. Nevertheless, scenes of non-royal hunting may also serve as an assertion of Assyrian domination over the land, akin to the way the destruction of orchards in captured foreign lands did.[318] The large number of hunting scenes on private seals suggests that hunting was also a popular theme among the Assyrian population at large, though many of these hunting scenes have a clearly mythological character, so the hunter represented may not always be intended to stand for the owner of the seal himself.

While the Assyrian military was divided into a number of different units (e.g. the *kiṣir šarrūti*, provincial units, etc.), the three basic elements of which these units were comprised were chariotry, cavalry and infantry. Chariots, invariably depicted carrying archers in battle scenes, tended to have more numerous crews as well as more protection for their crews (especially for the king) over the course of the Neo-Assyrian Period. Indeed, the chariots themselves appear to have become larger.[319] The reliefs suggest that this trend reached its high point in the reign of Sargon II, where dual shieldmen or shieldmen with two shields seem to have been usual, a trend that continued through the reign of Assurbanipal. However, though the chariots grew larger and with an increasing number of crew members, their importance in combat appears to have declined, with emphasis falling instead on cavalry (a trend that is particularly notable by the reign of Sennacherib).

Thus, Assyrian cavalrymen started as principally archers who rode in tandem with a shieldman whose primary job was to handle the archer's horse for him, freeing him up to focus on shooting. By the reign of Shalmaneser III, we find dedicated mounted archers and spearmen, as well as multi-purpose cavalrymen who could employ both weapons, a situation which continues and expands throughout the rest of the period.

Infantry archers are abundantly attested in reliefs and other iconographic sources throughout the Neo-Assyrian Period, however when they are depicted engaging in combat, it is nearly always in attacking a city. They are shown taking part in field battles far less frequently (though this is doubtless partly

[318] see Radner 2000, p. 240
[319] see Noble 1990

due to the fact that field battles are depicted far less frequently than attacks on cities). Lines of achers arrayed outside a city and firing at it, first attested in the reign of Shalmaneser III, was only sporadically used in following generations, though the most extravagant use of this theme was by Sennacherib in the Southwest Palace (particularly his depiction of the attack on Lachish). While long coats of armor were sometimes used as the archer's primary defense in the early part of the Neo-Assyrian Period (Assurnasirpal II through Shalmaneser III), shieldmen and siege shields became the standard manner of defending archers from the reign of Tiglath-Pileser III on. Non-Assyrian "auxiliaries," first appearing in the reign of Tiglath-Pileser III and distinguished by wearing kilts and sometimes headbands but never armor, are shown operating in conjunction with the Assyrian armor for the rest of the period. They are never shown sheltered by shieldmen, and they often take position in front of Assyrian archers protected by shieldmen (e.g. Figure 4.34), which raises the issue of how closely they operated with the rest of the Assyrian military in tactical situations, a subject upon which textual sources are unfortunately mute.

5. Bows, Quivers and Arrow Shafts

Archery equipment, aside from arrowheads, tends to be preserved poorly as it is usually made from organic materials. Thus, for the most part, information about these items must be gleaned from textual and iconographic sources.

5.1. Bows

Bows were invariably made from organic materials, thus it is no surprise that none survive from ancient Assyria.[1] However, iconographic information and finds from other regions can tell us a good deal about bows in the Neo-Assyrian Period.

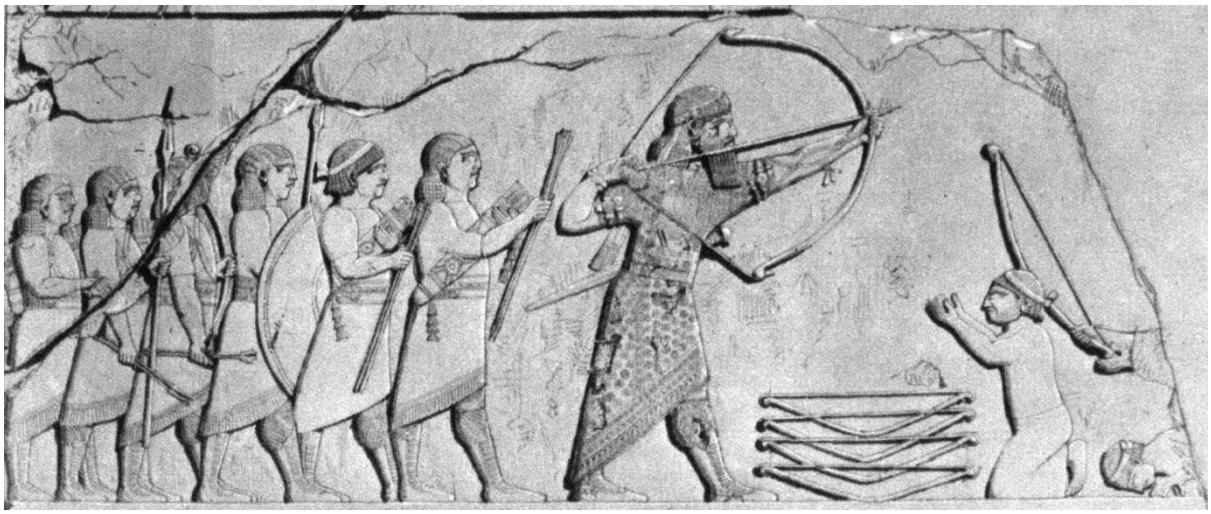

Figure 5.1: Assurbanipal tests his bows. Those stacked before him are triangular, while a convex bow is being held out by a damaged figure on the left; after Barnett 1976, pl. 47.

In terms of composition, there are two primary types of bows: self bows and composite bows. Self bows are made from a single stave of wood and, having been attested as early as the Upper Paleolithic,[2] were a very old and doubtless well-understood technology by the early 1st Millennium BC. The draw weight of a self bow was determined by the length and thickness of the bow stave, as well as the type of wood.[3]

One potential disadvantage of self bows was that if left strung too long, they would "follow the string," that is the bow stave would begin to assume the curvature imposed on it by the bow string

[1] Zutterman 2003, p. 125
[2] Miller *et al* 1986, p. 180
[3] Zutterman 2003, p. 121

(caused by fibers in the wood buckling under the strain),[4] and the resulting decrease in tension would rob the bow of some of its power. Because of this, self bows would not have been left strung, but rather left unstrung and only strung again when use was imminent. Furthermore, if a self bow is made to sustain a long draw – and thus generate the maximum of power to propel the shot – it must necessarily be quite long and thus impractical to use on horseback.[5]

Composite bows, first attested in Mesopotamia in the mid-3rd Millennium BC,[6] are built up from a variety of different materials. Various materials were used for the construction of composite bows in different regions, and no evidence survives from Assyria to infom us as to exactly what materials were used there.[7] Typical composite bows are based on a thin wood spine which primarily acts as a surface to glue the other materials to. Horn was usually used for the back of the bow since it compressed well, while sinew would be used for the front of the bow since it responded well to tension.[8] These two materials would work together to very efficiently transfer the power of the draw to propelling the arrow; a properly made composite bow could have twice the power of a self bow of the same draw weight.[9]

While the manufacture of composite bows is far more complex and time consuming (sometimes requiring over a year)[10] than that of self bows, they do not suffer from some of the latter's defects. Because their power can be increased by altering the shape and materials of the bow rather than its length, short but powerful bows suitable for use on horseback could be made.[11] Composite bows also were not prone to "follow the string" and could be left strung for long periods of time, such as an entire campaign season, which means that the weapon would always be ready for use at a moment's notice.[12] Because of this, depictions of bow that are strung but not in use (such as those carried in bow cases) are certainly composite bows.

In terms of form, there are several kinds of bows: convex, triangular, recurved and B-shaped (see Figure 5.2). The convex bow is the simplest form; when strung, the bow stave is pulled into a gentle and continuous curve. Triangular bows, frequently attested in Assyrian reliefs, are similar except they come to something of a point in the center of the bow stave where the hand would grip it. The arms of the bow are fairly straight, so it is shaped something like a triangle. Recurved bows have the tips

[4] Miller *et al* 1986, p. 181
[5] Miller *et al* 1986, p. 182
[6] Miller *et al* 1986, p. 180
[7] Zutterman 2003, p. 127
[8] Miller *et al* 1986, p. 183
[9] Miller *et al* 1986, p. 187
[10] Miller *et al* 1986, p. 184
[11] Zutterman 2003, p. 122
[12] Miller *et al* 1986, p. 185

of their arms curve back forward, and B-shaped bows not only have forward-curving tips, but also the center of the bow stave is bowed back towards the shooter.[13]

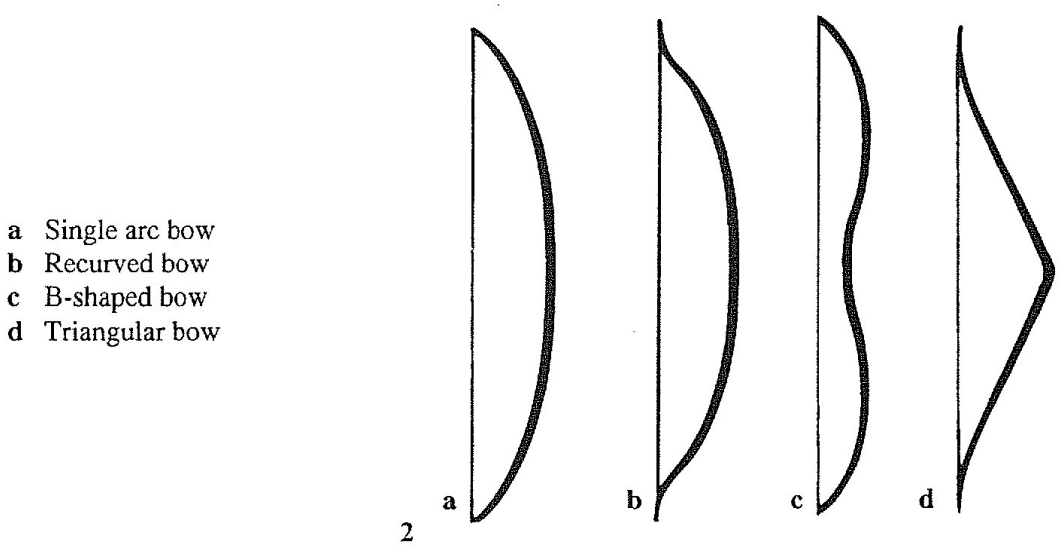

Figure 5.2: Basic bow shapes, a) convex, b) recurved, c) B-shaped, d) triangular; after Zutterman 2003, fig. 1

Identifying bows in reliefs pose some problems. Composite and self bows can share some of the same forms. Composite bows can sometimes be identified by rigid ears (which fit onto the ends of the bow and which the string loops over), which self bows do not require, and by being carried in bow cases, since self-bows would be un-strung after use.[14] Un-strung bows bundled together as loot[15] are most likely self bows, since composite bows would typically be left strung for long periods, and stringing and un-stringing them was a delicate enough matter that it was sometimes left to the bow makers themselves.[16]

Zutterman's analysis of Assyrian reliefs show that triangular bows were by far the most commonly depicted on Assyrian reliefs throughout the Neo-Assyrian Period, while the remainder are nearly all convex bows, with a very few examples of recurved bows found in the reliefs of Assurnasirpal II.[17] Babylonia, during the Neo-Assyrian and Neo-Babylonian Periods, also used triangular and convex composite bows very like those of the Assyrians.[18] The sparse depictions of bows from northwestern Iran during this period are, with one exception, all of triangular bows.[19] The exception is a bronze

[13] Zutterman 2003, p. 158
[14] Zutterman 2003, p. 125
[15] e.g. Barnett, Bleibtreu & Turner 1998, pl. 252
[16] Miller *et al* 1986, p. 185
[17] Zutterman 2003, p. 126
[18] Zutterman 2003, p. 132
[19] Zutterman 2003, p. 137-138

model of a bow from Marlik, which has an unusual and otherwise unattested shape: it is convex with slightly recurved tips, and the center of the bow staff, where the hand would grip it, projects forward in a rather sharp triangular form.[20] The small size of this artifact makes it certain that it was never used in any practical way, and thus it could simply be a fanciful design rather than an accurate depiction of a type of bow in use at the time.

Urartian depictions of bows often appear to be recurved composite bows (sometimes with a longer upper arm, apparently borrowed from "Scythian" type bows[21]), which Zutterman speculated would have been considerably more powerful than Assyrian bows.[22] Nevertheless, slightly less than half of the Urartian depictions of bows show convex composite bows, very similar to the Assyrian examples except that they appear to be somewhat smaller.[23] Zutterman asserted that the Urartians focused on small bows because they were "good horsemen."[24] Shorter bows were certainly easier to fire from horseback, which suggests that, at least, the Urartians may have focused on mounted combat more than the Assyrians did, whether claims about their equestrian skills can be supported or not.

Zutterman speculates that the Assyrians did not adopt the more powerful recurved composite bow of their neighbors due to simple conservatism,[25] however any careful review of Assyrian reliefs shows that Assyrian military equipment did indeed go through some considerable change throughout the period (see §3.2). And while Assyrian reliefs do indeed appear to indicate that the recurved composite bow was not adopted – at least not as standard military gear - by the end of Assurbanipal's reign, it must also be remembered that iconographic depiction – Zutterman's primary source for the Neo-Assyrian Period – cannot be regarded as an entirely trustworthy and accurate source for military equipment. Thus the use of triangular bows in Assyrian reliefs may not so much represent military conservatism as iconographic conservatism; the triangular and convex bows may have been considered part of the Assyrian "ethnic uniform" by the sculptors, just as *lorica segmentata* was used to distinguish Roman soldiers on Trajan's Column, regardless of what equipment was actually used in practice, in order to make the meaning of the iconographic display clear to the viewer (see §3.2.1). Furthermore, given that after the fall of Assyria, the Babylonians also appear to have, as Zutterman put it, "ignored"[26] the powerful new recurved composite bow and continued to use the traditional triangular and convex composite bows, these bows may have some advantage in use or manufacture over recurved composite bows that has not yet been identified.

[20] Negahban 1996, p. 282 & pl. 127
[21] Zutterman 2003, p. 135
[22] Zutterman 2003, p. 133
[23] Zutterman 2003, p. 134-135
[24] Zutterman 2003, p. 134
[25] Zutterman 2003, p. 132
[26] Zutterman 2003, p. 149

5.2. Quivers & Bow Cases

Quivers could be made of leather, bronze, or even apparently wood.[27] They were sometimes decorated with ornaments[28] or precious metals such as silver[29] or gold.[30] Even plain bronze quivers were decorated with embossed and engraved designs. Being at least partly made of inorganic materials, a number of bronze quivers have survived.

Complete bronze quivers are attested prior to the Neo-Assyrian Period,[31] however those dating to the early 1st Millennium BC might better be termed "quiver covers."[32] They cover only the outward-facing half of the quiver (sometimes wrapping a bit farther around so they cover somewhat more than half of the quiver surface[33]). They may have been mounted on top of a complete quiver made of organic materials (most likely leather or felt[34]), however the organic material may also have only filled the gap left by the bronze. The back of the quiver was not covered with bronze since it would rest against the archer's back and thus not be seen. Making a complete cylinder of bronze would have been somewhat more expensive to manufacture, though perhaps no heavier than a full leather quiver due to the thinness of the bronze sheet used (ca. 1 mm[35]).

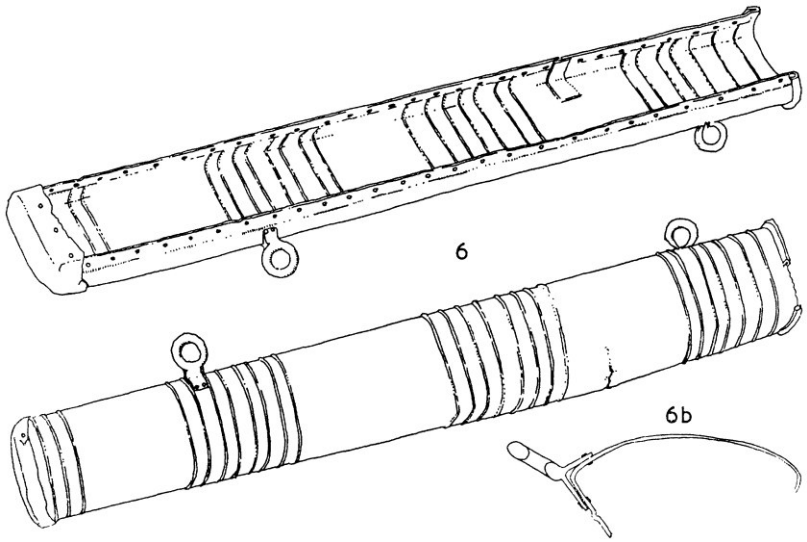

Figure 5.3: Back and front views as well as a section of one of the quivers of Group B from Kayalıdere, illustrating how the quiver cover encompases slightly more than half the surface of the quiver, leaving the back to be covered with a perishable material; after Burney 1966, p. 96, fig. 6.

[27] GIŠ.*iš-[pa]-a-te*; see SAA VII 89, 1
[28] SAA VII 63, ii 1
[29] SAA XI 27, 6
[30] SAA VII 63, ii 4 – the weight of gold given, 1 mina 7 1/6 shekels (over half a kilo), suggest that these were ceremonial or symbolic quivers of solid gold. The context of the text suggests they may have belonged to a cult statue or other important sculpture.
[31] e.g. Montero Fenollós 2004, p. 22, from Mari, dating to the Middle-Assyrian period
[32] Moorey calls them "quiver plaques;" see Moorey 1975.
[33] e.g. Barnett & Gökce 1953, pl. 18: 4; another clear example can be found at Seidl 2004, p. 90, fig. 55.
[34] Collon 2008, p. 99
[35] e.g. Burney 1966, p. 93

Quivers covers, or fragments thereof, have been attested at a number of sites. For example, one quiver, undecorated and in poor condition, was reported at Nimrud (Fort Shalmaneser).[36] Another quiver was found at Hasanlu, still containing the remains of some arrows,[37] and several fragmentary examples were uncovered at Marlik.[38] A number of elaborately decorated quiver covers in of unknown provenance reportedly come from Luristan,[39] and a further quiver of unknown provenance in the possession of the Metropolitan Museum of Art is simply described as being from "western Asia."[40] The majority of attested quivers from known sites, however, come from Urartu: a number were found as Karmir Blur (including one with an inscription from the Urartian king Sarduri),[41] one from Altın Tepe,[42] at least seven from Kayalıdere,[43] and six quivers and quiver fragments from Toprakkale.[44] The prevalence of Urartian quivers does not necessarily mean that bronze quiver covers were more commonly used in Urartu than elsewhere in the ancient Near East, however. The region of Urartu is notorious for yielding unusually large quantities of bronze artifacts in general,[45] thus the large number of bronze quiver covers found at Urartian sites is merely a reflection of whatever processes led to the unusually frequent preservation of Urartian bronzework.

Quivers were normally decorated wih various designs, commonly horizontal bands and sometimes diagonal lines forming X-shapes over the center of the quiver. Preserved quiver covers show that the typical quiver decorations shown on reliefs (see Figure 5.6 for examples) are broadly accurate, though they often leave out the fine detail, such as the engraved zigzag lines sometimes found on the horizontal bands as well as the embossed scenes featuring animals and/or humans (e.g. Figure 5.4). These embossed scenes are particularly noteworthy in the Luristan examples, where they cover nearly the whole surface of the quiver covers in horizontal bands. However, as these artifacts were obtained through the antiquities market from illicit excavations, they may represent simply the quiver covers the antiquities dealers thought would be most profitable rather than an accurate proportion of deposited quiver covers in that region. It is perhaps ironic that while the palaces of Nimrud show innumerable decorated quivers, the one example found there archaeologically, in Fort Shalmaneser, is plain and undecorated.[46]

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[36] Oates 1961, p. 13
[37] Barnett & Gökce 1953, p. 127; Muscarella 1989b, p. 28, fig. 8
[38] Negahban 1995, pp. 94-97
[39] Moorey 1975; Muscarella 1989a, pp. 192-199; Calmeyer 1969, pp. 81-87
[40] Mertens 1992, p. 55, no. 22
[41] Barnett & Watson 1952, p. 139 & pl. 32; Barnett & Gökce 1953, p. 127; Moorey 1975, p. 20
[42] Barnett & Gökce 1953, p. 126-127
[43] Two on the terraces of the Upper Citadel (Burney 1966, p. 81), five in Group B (Burney 1966, pp. 93 & 96, fig. 6, pl. 18:b & c), and a fragment of a belt or quiver from the raised pavement next to the temple (Burney 1966, pp. 77-78 & 91).
[44] Barnett 1972, pp. 168-172
[45] Zimansky 1995a, p. 108
[46] Oates 1961, p. 13

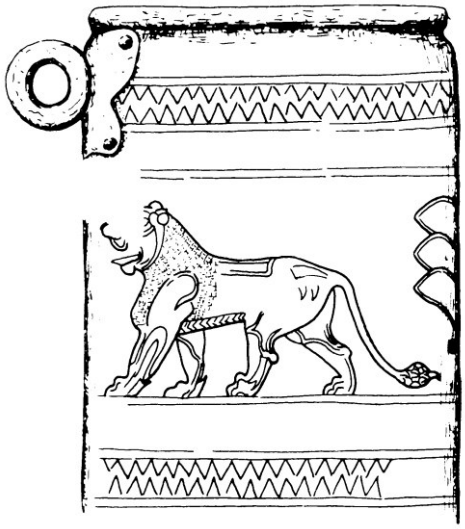

Figure 5.4: Decorations on Quiver 1 from Toprakkale; after Barnett 1972, p. 169, fig. 6.

Figure 5.5: Quiver cover from Luristan; after Calmeyer 1969, p. 85, fig. 86.

Quivers are attested in reliefs throughout the Neo-Assyrian Period. The exact form of quivers depicted in reliefs is not always possible to discern since they are often behind the archer's body with only the top of the quiver visible over his shoulder.

The most common form of quiver, found throughout the period, is a slightly cone-shaped quiver with a rounded bottom (Figure 5.6: 5 & 10).[47] Though prolifically attested in iconographic sources, there are no certain archaeological attestations of round-bottomed quivers (though many preserved quivers are in a fragmentary state and missing their bottom section). The quiver covers from Luristan may have belonged to round-bottomed quivers – the bottoms of the covers are only slightly curved, but they are pierced to be sewn to the quiver they would cover (see Figure 5.5).[48] Thus the bottom of the plate may not reflect the shape of the quiver it was attached to (note that some round-bottom quivers

[47] e.g. Budge 1915, pls. 13, 14, 15, 20 & 23; Curtis & Tallis 2008, figs. 9, 19 & 25; King 1915, pls. 15, 21, 24, 30, 35, 36, 40, 42, 58 & 65; Albenda 1986, pls. 95, 96, 97?, 119, 120 & 124; Barnett, Bleibtreu & Turner 1998, pls. 36, 54, 55, 170, 172, 184, 275, 283 & 314; Barnett 1976, pls. 17, 21, 33, 36, 39, 46, 47, 56 & 68. The only depictions of round-bottomed quivers in the reliefs of Tiglath-Pileser III also have tassels on their upper ends; see Barnett & Falkner 1962, pls. 27 & 78. Round bottomed quivers are also attested on ivories, e.g. Herrmann & Laidlaw 2009, no. 61 (pl. 10); Mallowan & Davies 1970, no. 58 (p. 27, pl. 16).

[48] e.g. Moorey 1975, p. 21, fig. 1 & p. 27, fig. 6 as well as Calmeyer 1969, p. 85, fig. 86

have a horizontal line near the bottom, which may indicate the bottom edge of the bronze cover; e.g. Figure 5.6: 7-11). Quivers that have flat rather than rounded bottoms (Figure 5.6: 5 & Figure 5.3) possibly appear in the reliefs of Tiglath-Pileser III[49] and certainly in those of Sargon II[50] and Sennacherib,[51] as well as on several ivories.[52] These have certainly been attested archaeologically, with a number of examples from Urartian sites.[53]

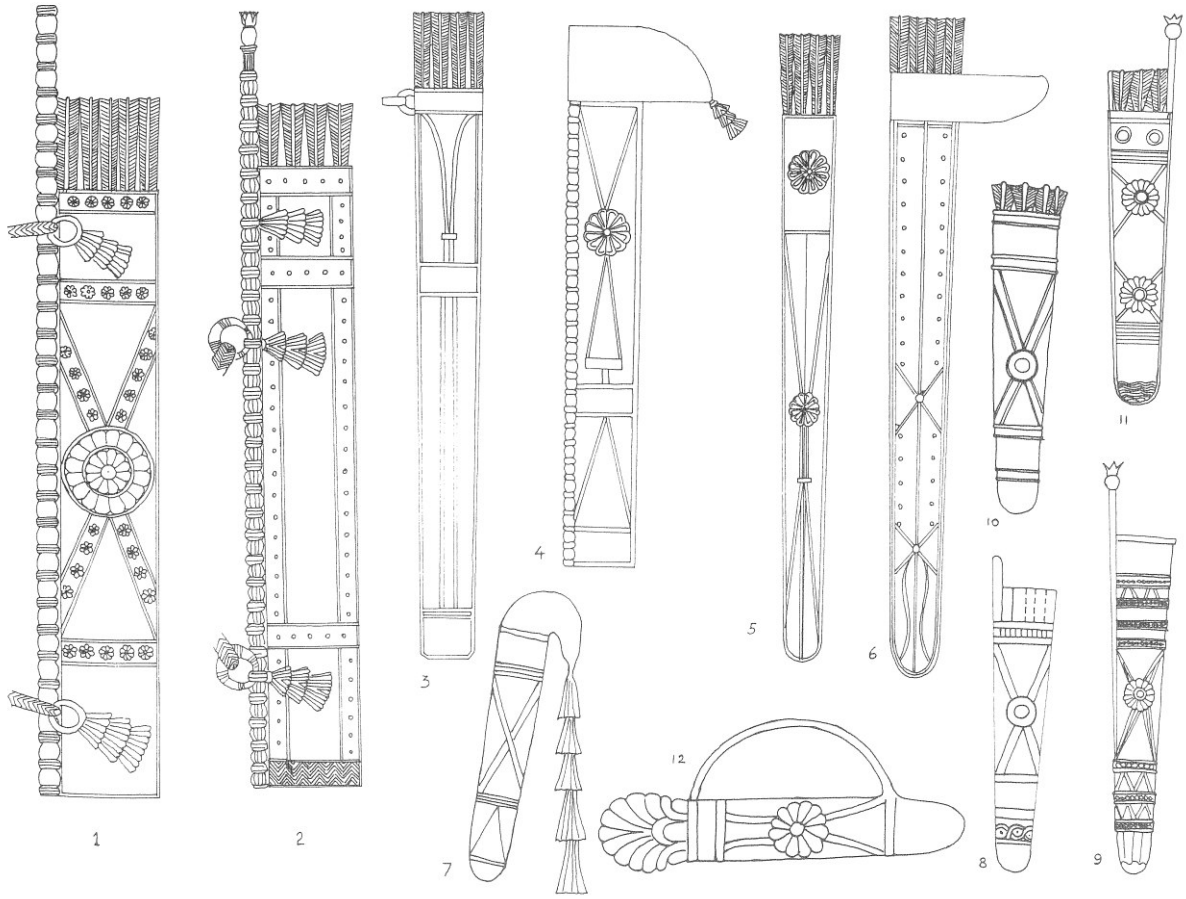

Figure 5.6: Various quivers from Assyrian reliefs; after Madhloom 1970, pl. 25.

Other quivers have what appears to be a rod, longer than the quiver itself and thus protruding above it, with elaborate turned designs (Figure 5.6: 1, 2, 8, 9 & 11). These appear only in the reliefs of Sargon II, Sennacherib and Assurbanipal.[54] A further variant are quivers which have tassels hanging from

[49] Barnett & Falkner 1962, pl. 86 (The bottom end of the quiver is unclear, but appears to be flat; the top is tasseled)
[50] Albenda 1986, pls. 100?, 102 & 121
[51] Barnett, Bleibtreu & Turner 1998, pl. 485
[52] e.g. Herrmann & Laidlaw 2009, no. 46 (p. 138, pl. 7); Mallowan & Davies 1970, no. 27 (p. 22, pl. 10).
[53] Kayalıdere: Burney 1966, pl. 18:c; Altın Tepe: Barnett & Gökce, pl. 18:5-6; Toprakkale: Barnett 1972, p. 171, figs. 8a & 8b; Karmir Blur: Piotrovsky 1970, unnumbered plate at end of Russian text section.
[54] Albenda 1986, pls. 45, 70, 74 & 137; Barnett, Bleibtreu & Turner 1998, pls. 70, 75, 184, 194, 199, 214, 242, 265 & 483; Barnett 1976, pls. 2, 16, 56?, 60, 67, 69 &72

their upper ends. They are first attested in the reliefs of Tiglath-Pileser III and continue through Assurbanipal[55] and are attested in two basic forms. The earlier examples, appearing in the reliefs of Tiglath-Pileser III, Sargon II, Sennacherib and Assurbanipal, tend to have a number of short tassels all hanging down individually from the top of the quiver (Figure 5.7 and Figure 5.8).

Figure 5.7: A quiver with short tassels; after Barnett & Falkner 1962, pl. 35.

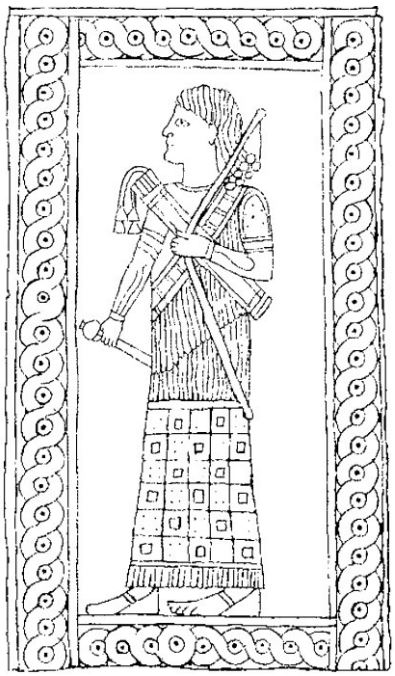

Figure 5.8: An individual (perhaps an officer) holding a mace, with a bow slung over his shoulder and a square-bottomed quiver with short tassels at its mouth, from an ivory found in the Central Palace; after Herrmann & Laidlaw 2009, pl. 127 (CPIb. BM 118101).

[55] Barnett & Falkner 1962, pls. 27, 35, 58, 72, 78 & 86; Albenda 1986, pls. 99, 130 & 134; Barnett, Bleibtreu & Turner 1998, pls. 48, 60, 145, 146, 464 & 466; Barnett 1976, pl. 9, 35 & 60. Also attested on an ivory from the Central Palace, possibly also dating to Tiglath-Pileser III: Herrmann & Laidlaw 2009, no. CPIb. BM 118101 (p. 230, pl. 127).

The reliefs of Sargon II introduce a new style, where there is one long tassel (perhaps made up of a number of small tassels bound together; Figure 5.6: 7),[56] which becomes the dominant style under Sennacherib[57] and Assurbanipal.[58] A further quiver design that appears on both round- and flat-bottomed quivers possess a tongue or flap around the mouth of the quiver that extends to one side, somewhat reminiscent of a turned-down cuff (Figure 5.6: 4 & 6). Like the quivers with rods, this form of quiver is attested only in the reliefs of Sargon II and perhaps Sennacherib.[59] There are two additional rare froms of quiver covers. Quivers topped by a circular cover with concentric rings appear only in the reliefs of Sennacherib (Figure 5.9).[60] Reade identified the individuals bearing these quivers as Ellipians (from an area corresponding roughly to Luristan).[61] Quivers with tops resembling of a palm fronds are attested only in the reliefs of Assurbanipal from the Southwest Palace at Nineveh, borne by Elamites fighting against the Assyrians during Assurbanipal's campaign along the River Ulai (Figure 5.6: 12).[62]

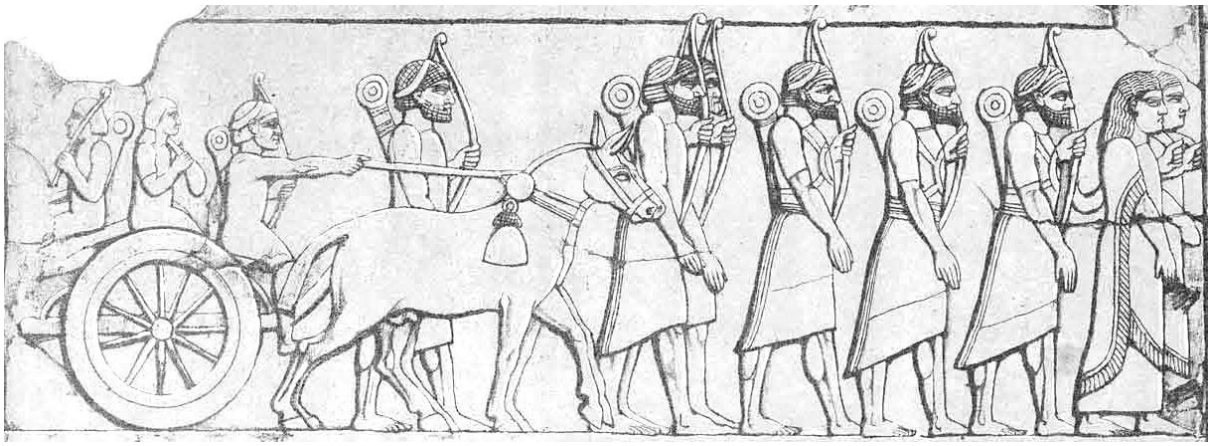

Figure 5.9: Deportees (possibly Ellipians) bearing bows and quivers with circular covers, from the reliefs of Sennacherib;after Layard 1853b, pl. 33.

The greater variety of quiver types in the reliefs of Sargon II and Sennacherib is perhaps explained by the military reforms attributed to Tiglath-Pileser III.[63] These began to incorporate large numbers of non-Assyrians into the Assyrian military,[64] and some of these doubtless brought with them gear – including quivers – characteristic of their native land or ethnic group, some of which may have been

[56] Albenda 1986, pl. 134
[57] Barnett, Bleibtreu & Turner 1998, pls. 48, 60, 464 & 466
[58] Barnett 1976, pl. 35 & 60; here the tassels appear to exceed the length even of the quiver itself.
[59] Albenda 1986, pl. 102; Barnett, Bleibtreu & Turner 1998, pl. 112?
[60] Barnett, Bleibtreu & Turner 1998, pls. 371, 389, 393 & 394
[61] Reade 1976, pp. 97-99
[62] Barnett, Bleibtreu & Turner 1998, pls. 288-289
[63] von Soden 1963, p. 143; Harrison 2005, p. 24
[64] Kaplan 2008, p. 136

adopted by the Assyrian military in general. Regardless of how these foreign forms of equipment were actually used, sculptors may have employed them to indicate the ethnicity of individuals depicted on reliefs.

5.2.1. Quivers on chariots

Chariots often carried quivers hung on their sides, typically in pairs, often also containing a small ax (see Figure 5.10, Figure 4.15 & Figure 4.16). These quivers often seem larger than usual as well, and they stress the importance of the chariot as a mobile archery platform. Chariot-mounted archers appear to have been very well supplied with arrows, though whether this is an indication of their high social status or their function in combat is difficult to discern.

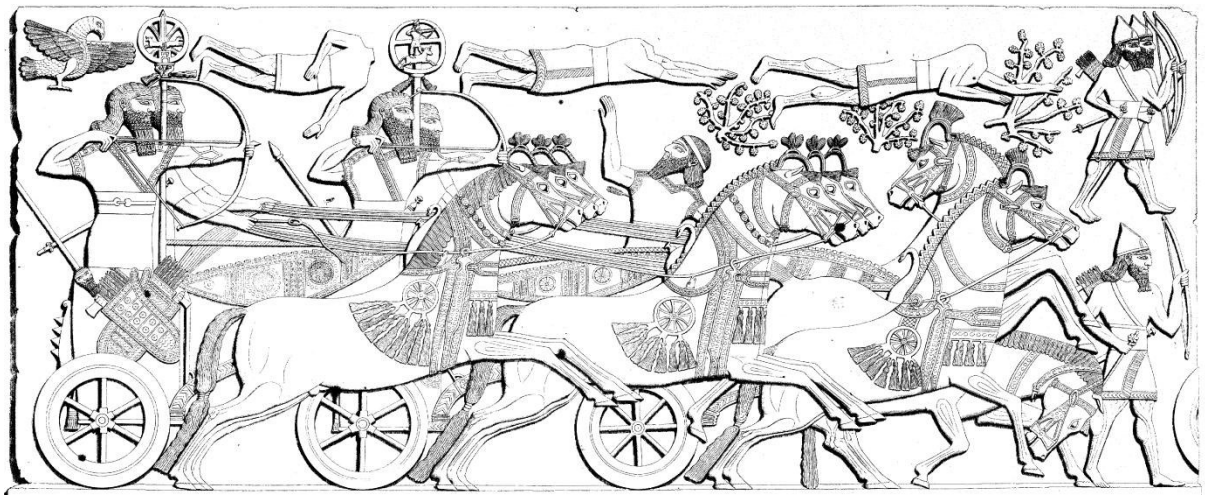

Figure 5.10: Chariot mounting crossed quivers (far left, from the reliefs of Assurnasirpal II; after Layard 1853a, pl. 11 (drawing of Budge 1914, pl.14).

Chariot-mounted quivers are attested heavily in the earlier portion of the Neo-Assyrian Period. There are numerous depictions under Assurnasirpal II[65] and even more on the Balawat Gates of Shalmaneser III.[66] The reliefs of Tiglath-Pileser III, however, contain no depictions of chariots with quivers, and those of Sargon only have one certain example.[67] There is one further example in the reliefs of Sennacherib despite the numerous depictions of chariots in his reliefs,[68] and there are none from Assurbanipal. This apparent decline in the usage of chariot-mounted quivers over the Neo-Assyrian Period may be related to changes in the use of the chariot. While chariots served a major role in the

[65] Budge 1914, pls. 12?, 14, 15, 16, 17, 18, 22, 23, 25 & 42; on the White Obelisk: Sollberger 1974, pls. 42-45; on the Balawat Gates of Assurnasirpal II, Curtis & Tallis 2008, figs. 7, 9, 11, 13, 15, 19, 23, 25, 27, 29, 31, 35, 37, 57, 59, 69, 75 & 85

[66] King 1915, pls. 1, 3, 13, 19, 22?, 23, 29, 35, 36, 41, 42, 47, 52?, 53, 55, 56, 58, 59?, 61, 62, 67?, 74, 75 & 76

[67] Albenda 1986, pl. 117

[68] Barnett, Bleibtreu & Turner 1998, pl. 346

Assyrian military in the early Neo-Assyrian Period, they do appear to have been used considerably less in battle in the last century or so of the Neo-Assyrian Period. Noble even goes so far as to say that from the reign of Sennacherib on, they were not used in battle at all.[69] Thus, the relative lack of quivers on chariots in the later Neo-Assyrian Period is likely a reflection of their decline as a weapon of war, though they lingered on as a status symbol.[70]

5.2.2. Bow Cases

Bow cases bear some similarities to quivers, however they were necessarily larger, as they had to hold a strung bow. Bows carried in bow cases were certainly composite bows – as stated above (§5.1), self bows would have been un-strung after each use to prevent the bow from "following the string" and losing its strength, however composite bows could be left strung for long periods of time. Thus, they could be carried in a bow case, ready to be drawn and used at a moment's notice.

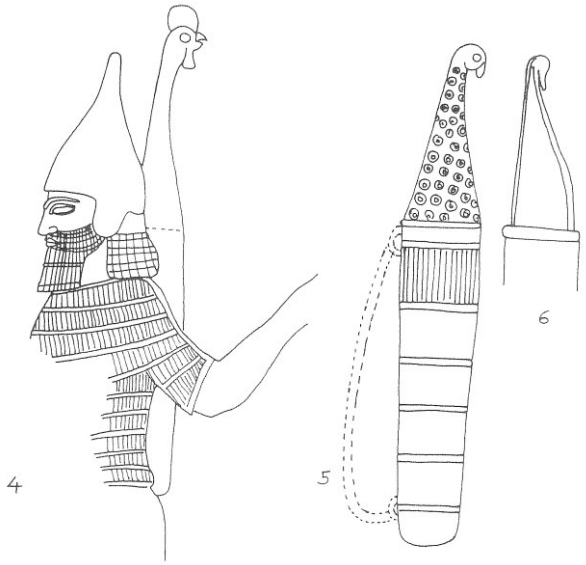

Figure 5.11: Bow cases from the reliefs of Sennacherib. No. 4 and No. 5 have rooster-head covers (see Barnett, Bleibtreu & Turner 1998, pls. 259-260), while No. 6 is the more common open-topped variety, usually mostly hidden behind the archer; after Madhloom 1970, pl. 24.

No identifiable bow cases survive from this time period. It could be that the bow cases were made entirely from organic materials. However, even if they had bronze covers like quivers, it must be observed that they are attested far less frequently than quivers in reliefs. Many archers carried their bows by simply hanging it over their shoulders, and thus required no bow case. However all archers required quivers to carry their arrows. And given how few quiver covers survive, it is understandable that the far less common bow case might not be preserved at all.

[69] Noble 1990, p. 66
[70] Noble 1990, pp. 67-68

Bow cases are not as commonly depicted in Assyrian reliefs, however they seem to have been used for the entire period. The reliefs of Assurnasirpal II have one possible depiction of a bow case: two soldiers with swords and shields pursue a lion that is attacking the king's chariot, and behind them is what appears to be the top of a bow in the position it would be if it was being carried in a bow case.[71] Unfortunately, the position of their bodies blocks any view of the bow or bow case. Bow cases are clearly visible, however, in the Balawat Gates of Shalmaneser III, looking like large quivers with a triangular top (clearly some kind of lid or flap covering the top part of the bow), and normally carried by foot soldiers,[72] but also on occasion by cavalry.[73] The reliefs of Tiglath-Pileser III only have one example of a soldier with a bow in a bow case,[74] as do the reliefs of Sargon II.[75] In the former, the top of the bow can be seen protruding from the case, in the latter, there is one bow case which may or may not have had a cover like those of the Balawat Gates, and another has the top covered by a sack-like object with tassels. The reliefs of Sennacherib, however, contain numerous depictions of bow cases being carried by both infantry and cavalry.[76] In most cases, the top of the bow is visible emerging from the bow case, however a small number of examples have covers,[77] some of which are shaped like rooster heads (see Figure 5.11).[78] The reliefs of Assurbanipal also contain numerous examples of bow cases (see Figure 4.27).[79] Bow cases are thus attested for most of the Neo-Assyrian Period, certainly from Shalmaneser III to Assurbanipal, with their apparent heaviest usage in the reigns of Shalmaneser and Assurbanipal.

5.2.3. Chariots with quivers and bow cases

Chariots also sometimes mounted both a quiver and a bow case on the same side of the chariot. Certain examples of this are rare, however, with only two examples for Assurnasirpal II[80] and one for Sennacherib.[81]

It is certainly possible that chariots normally carried two quivers on one side, and on the other side a quiver and a bow case, and therefore two quivers or a quiver and a bow case were depicted depending on which side of the chariot is shown. If this was the case, however, the side upon which the gear was

[71] Budge 1914, pl. 12, left-hand side of #2
[72] King 1915, pls. 19, 20, 23, 24, 40 & 60
[73] King 1915, pl. 60
[74] Barnett & Falkner 1962, pl. 59
[75] Albenda 1986, pl. 134
[76] Barnett, Bleibtreu & Turner 1998, pls. 36, 49, 60, 62, 64, 73, 74, 82, 136, 140, 147, 159, 174, 178, 180, 184, 186, 193, 206?, 229, 259, 275, 276, 278, 280, 281, 283, 329, 336, 338, 342, 346, 354, 366, 377, 386, 388, 396, 398, 400, 401, 464, 468, 470, 506, 507 & 508
[77] Barnett, Bleibtreu & Turner 1998, pls.377 – the drawing lacks some detail, and the relief is damaged, so it is possible that the bow was originally depicted emerging from the bow case.
[78] Barnett, Bleibtreu & Turner 1998, pls. 259 & 260
[79] Barnett 1976, pls. 16, 17, 19, 25 & 60; Barnett, Bleibtreu & Turner 1998, pl. 304
[80] Budge 1914, pls. 14 & 25
[81] Barnett, Bleibtreu & Turner, pl. 346

hung must have varied from chariot to chariot, since quivers with bow cases are depicted on both the right and left sides of chariots.[82] Since depictions of quivers considerably outnumber those of quivers with bow cases, it is perhaps more likely that bow cases were not standard chariot gear, whereas quivers certainly were.

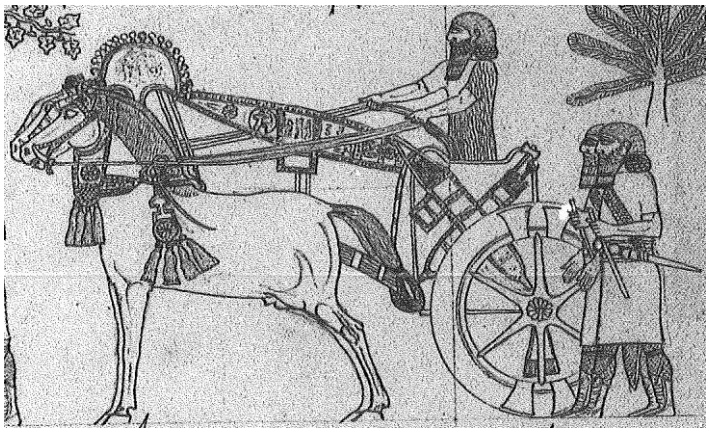

Figure 5.12: Chariot with crossed quivers and bow case, from the reliefs of Sennacherib. The top of the bow protrudes from the forward-pointing quiver; after Barnett, Bleibtreu & Turner 1998, pl. 346.

5.3. Arrow Shafts

Arrow shafts invariably have several components – the shaft itself, fletching (portions of feathers glued and/or bound to the tail end of the shaft), and a nock, which is a notch at the very end of the arrow that fits onto the bow string (see Figure 5.13). The nock was sometimes a separate piece attached to the end of the arrow shaft, and sometimes an additional foreshaft of some dense material was added to the front of the shaft and to which the arrowhead was fastened.

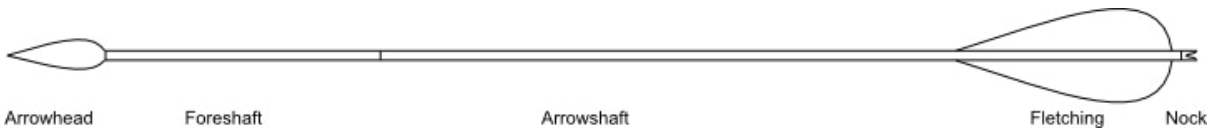

Figure 5.13: Components of an arrow.

Neo-Assyrian sources do not discuss arrow shafts or the materials they were made from. Other ancient Near Eastern sources, however, suggest that they were most likely typically made from reeds, which possess properties that make them ideal for arrow shafts.[83] For example, a Nuzi text records the order of twenty thousand reeds for arrow shafts.[84] Furthermore, while the tomb of Tutankhamon

[82] e.g. on left, Budge 1914, pl. 25; on right, Budge 1914, pl. 14
[83] Miller *et al* 1986, p. 188
[84] Miller *et al* 1986, p. 189

contained some arrows with wooden shafts,[85] reed arrows were far more numerous.[86] Tutankhamon's reed arrows all had wooden foreshafts,[87] as did those found at Dura-Europos.[88] These consisted of a length of wood, the same diameter as the reed, spliced into the forward end of the arrow shaft. Foreshafts were typically made of hardwood and their principle function was to give proper balance to the light-weight reed arrow shafts,[89] as well as to provide a more robust mounting point for the arrowhead so that the shaft would be less prone to split upon impact.

Even less can be said of fletching, as no traces of them survive either. The fletching on Tutankhamon's arrows varied from three to four vanes per arrow (though four vanes seem to have been more common).[90] The birds they came from were not identified. A 14th Century AD Mameluk text recommends the feathers of vultures as the best for fletching, and those of eagles as second best.[91] A 16th Century English treatise on archery, on the other hand, insists upon goose feathers.[92] Which sort were used in the Neo-Assyrian Period cannot be determined, though certainly larger sorts of birds were used, as only they would have feathers of sufficient size.

The nock, in its simplest form, is merely a groove cut into the back end of the arrow to help it sit firmly on the bowstring. However, like foreshafts, nocks could also be separate pieces fitted to the arrow shaft. Some of the arrows found in the tomb of Tutankhamon, for example, had separate nock pieces of hardwood,[93] ivory or bone.[94] Several possible bronze nock pieces were also found in the mid-3rd Millennium BC Royal Tombs of Ur (see Figure 5.14).[95] A bronze object from Hasanlu, a cap with crescent-shaped projections, was interpreted by Muscarella as possibly being a crescentic nock, or perhaps the terminal of a spear shaft (see Figure 5.15).[96] Its small size – just 2.9 cm in height – is too small for a spear, but does appear to be consistent with an arrow nock, particularly in that it closely resembles the crescentic nock of an arrowhead from the reliefs of Assurnasirpal II (see Figure 9.1, no. 16).[97] Nevertheless, it is doubtful that such a large nock would be effective in practice. Even if the weight of the bronze did not adversely affect the balance of the arrow, the projecting crescent

[85] McLeod 1982, p. 13
[86] McLeod 1982, pp. 14-25
[87] McLeod 1982, pp. 14-25, referred to as "footed"
[88] James 2004, p. 1959
[89] Miller *et al* 1986, p. 188
[90] McLeod 1982, pp. 15-25
[91] Latham & Paterson 1970, pp. 26-27
[92] Hardy 2006, p. 137
[93] e.g. McLeod 1982, nos. 50-53 & 55 (pp. 15-16)
[94] e.g. McLeod 1982, no. 54 (p. 16)
[95] Woolley referred to them as "string notches"; Woolley 1934, p. 305, pl. 227, nos. U.9358, U.6421, and U.7853
[96] Muscarella 1989a, p. 56, no. 67
[97] e.g. Madhloom 1970, pl. 26, no. 16 (for full relief, see Budge 1914, pl. 20)

would have a high likelihood of striking the bow stave as the arrow was released, which would ruin the shot.[98]

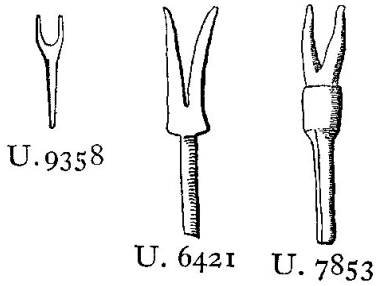

Figure 5.14: Possible bronze nock pieces from the Royal Tombs of Ur; after Woolley 1934, pl. 227 (not to scale).

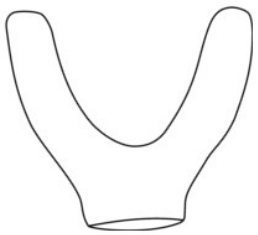

Figure 5.15: A possible bronze crescentic nock piece from Hasanlu level IV; after Muscarella 1989a, p. 56, no. 67 (1:1 scale).

5.4. Conclusions

The Assyrians are depicted primarily using triangular bows, though crescent and recurved bows are also attested. The majority of these bows appear to have been of composite construction (particularly those depicted as being carried in bow cases while strung), though some probable examples of self bows also exist. The Urartians are principally depicted using a recurved composite bow, which Zutterman considers to be superior to the triangular bow of the Assyrians. However, if this is indeed the case, it cannot be assumed that the Assyrians "ignored" a superior weapon type out of simple military conservatism, particularly as their other military gear shows some considerable evolution over the period. Therefore, there may well be other unknown factors that led the Assyrians to continue using their traditional bow, assuming that the continued depictions of Assyrians using triangular bows was not merely an iconographic convention. Several varieties of quivers are attested on reliefs: the normal quiver carried by an archer, large quivers carried by chariots, and quivers that also contain a case for a bow. Quivers came in a variety of shapes, some potentially being linked to specific ethnic groups (at least as an iconographic convention). Quivers sometimes had decorated bronze covers (or a portion of the quiver itself was bronze), some of which have been preserved. These not only offer clues on how the quivers were made, they also verify that some types of quivers depicted on reliefs were actually used. Bow cases are attested as early as Assurnasirpal II, but are only depicted with any frequency on reliefs under Sennacherib and Assurbanipal. Finally, arrow shafts are not well attested in Assyrian sources. However, other ancient sources, both textual and archaeological, suggest that they were most likely made of reeds, perhaps with wooden foreshafts. The nocks appear to have also often been separate pieces of wood, ivory, or perhaps bronze, that were spliced to the back end of the arrow shaft.

[98] The danger of large nocks striking the bow stave was recognized in a 14th Century AD Mameluke text on archery; see Latham & Peterson 1970, p. 24.

6. Characteristics and Manufacture of Arrowheads

6.1. Parts of an arrowhead

There has been no universal terminology for a discussion of the details of arrowheads, and many excavators and researchers use different terms for the same part, or refer to different parts with the same term, leading to confusion.[1] It is therefore important to establish an explicit terminology for describing arrowheads. In this, I do not precisely follow the terminology used by any particular author, but have endeavored to choose the most descriptive and/or widely used terms for the features in question. It should be noted that in discussions of the relative position of the parts of arrowheads the arrowhead should be envisaged with the tip pointing upwards (as in the illustrations), so that "up" means towards the tip of the arrowhead and "down" is towards the arrow shaft.

6.1.1. Basic features

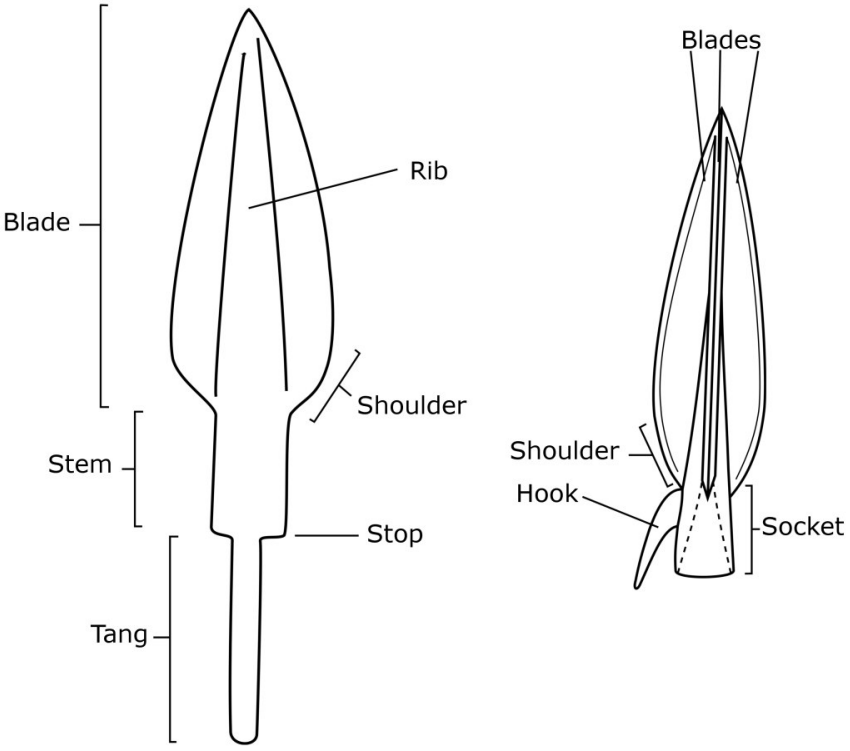

Figure 6.1: Basic parts of a leaf-shaped arrowhead and a trilobate arrowhead.

[1] For example, stops are referred to as a "stops" (Stronach 1958, p. 171; Muscarella 1989, p. 315, no. 440), "cuts" (Cross & Milik 1956, p. 17), "collared tangs" (du Plat Taylor *et al* 1950, p. 123), and "thickening between blade and tang" (Gottleib 2004, p. 1924).

6.1.1.1. Blade

The blade is the basic component of any arrowhead. It has a point to puncture the target and, except in the case of bodkins, edges which cut into the target, opening a wound. Arrowheads with a lenticular or rhomboid section have a single double-edged blade. For those with a rib or socket running the length of the blade, each side projecting from the central core of the arrowhead may be regarded as a blade. Thus, bilobates have two blades, trilobates three, and quadrilobates four (see Figure 6.3).

I have included a separate measurement for the length of the blade of arrowheads. The blade of an arrowhead is, naturally, its principle component. The length of tangs and stems can vary, and is not directly linked to the size of the blade. In general, longer blades have longer tangs, but there is a great deal of variation. Furthermore, since many of the arrowheads are at best indifferently preserved, it is often not possible to be sure if the full length of the tang is preserved or if some amount is broken off. It is far easier to tell if a portion of a blade has broken off, as they will not longer curve to a point. Therefore, blade length provides a considerably more effective means of comparing arrowheads than overall length.

Identifying the bottom of the blade is not always straightforward, as in many simpler arrowhead forms the blade will merge into the tang. For my measurements, I have chosen the mid-point of the concave curvature where the blade merges into the tang or stem. This point is admittedly difficult to identify with any precision in some cases.

6.1.1.2. Faces (bodkins)

Bodkins do not have proper blades, as they do not have cutting edges, rather only points and flat faces (or a curved face if it is round, see Figure 6.3, 1-3).

6.1.1.3. Shoulder

The shoulder is the area of the blade where the width is normally the greatest. Some blades curve gently, and some have a sharp angle. For a detailed discussion, see §6.1.4.

6.1.1.4. Rib

Ribs are narrow raised lines extending most or all of the length of both sides of the arrowhead. They are added to give greater rigidity to an arrowhead, to help prevent it from bending on impact. It is classified with other forms of sectional variation, see §6.1.3.

6.1.1.5. Stem

Stems are the area between the bottom of the blade and the stop on a stopped arrowhead. It is generally considerably thicker than the rest of the tang.

6.1.1.6. Stop

The stop is created by the difference in diameter of the stem (when present) and the tang. It provides a reasonably flat surface for the end of the arrow shaft to rest against, helping to prevent it from being driven up onto the blade during impact. For the various kinds of stops, see §6.1.5.

6.1.1.7. Tang

The tang is a length of metal projecting from the bottom of an arrowhead, inserted into the shaft in order to affix it to the arrow. The cross section of the tang can be round, squared, or irregular, and they tend to taper to a narrower diameter towards the bottom.

6.1.1.8. Socket

Sockets are cones in the base of an arrowhead, used to affix the arrow to the shaft. Instead of being inserted into the shaft, as with a tang, the socket is fitted over the end of the shaft.

6.1.1.9. Hook

A hook is a narrow thorn or barb of metal protruding from the socket and pointing downward. Hooks, like barbs (see §6.1.4.5), prevent the arrowhead from being easily removed after impact. Hooks are used solely on socketed arrowheads, and never with those that possess barbed shoulders, as they would be redundant.

6.1.2. Blade types

The blade type refers to the portion of the blade above the shoulder (all depicted below in Figure 6.2 have rounded shoulders except for no. 8, the chisel tip, which by its nature cannot have rounded shoulders).

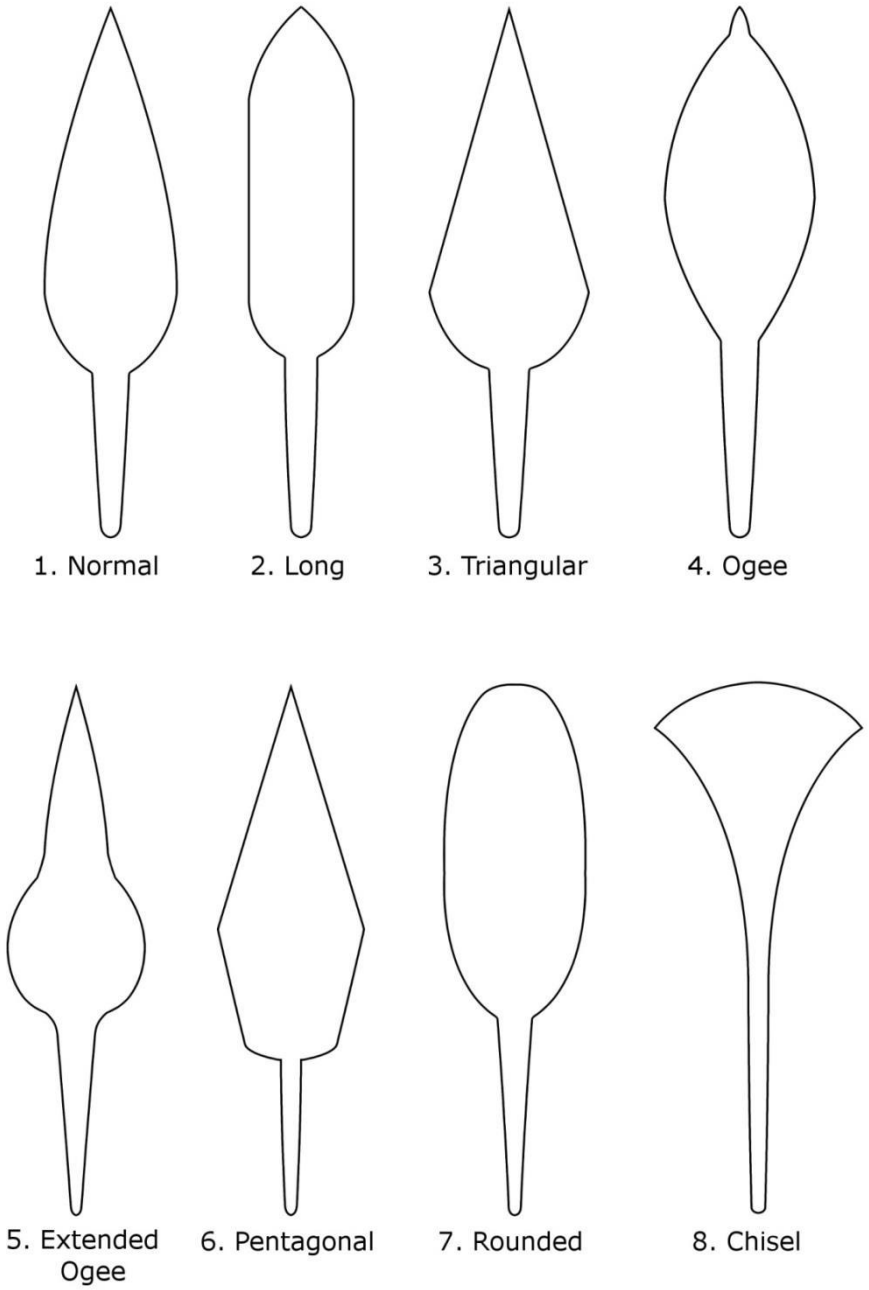

Figure 6.2: Types of blades.

6.1.2.1. Normal

Normal blades are, as the name implies, by far the most common form. The edges of the blades follow a gentle curve from the point out to the shoulder and then back in to the tang or socket. The location of the widest part of the blade in relation to the tip can make normal-type blades look rather different from each other, and some have included such differences in their typologies. Cross & Milik consider those with the widest part closer to the bottom than the tip "lanceolate" (or if wider than usual, "pointed-ovate") and those with the widest part nearer the tip "oblanceolate." Those with the

widest part of the blade equidistant from the tip and the bottom are called "eliptic" is they are rather thin in relation to their length and "ovate" if they are rather wide in relation to their length.[2]

I have classified these all under the same category for two reasons. First, distinctions based on the height and width of the widest part of the blade are rather subjective. Relative width, in particular, would be troublesome to classify, for one must arbitrarily posit a dividing line between "narrow" and "wide" arrowheads. The location of the widest portion of the blade in relation to the tip may be less subjective, however there is also clearly a great deal of variation in the location of this point. The Type 5a-1 arrowheads from Nimrud, for example, generally have the widest point closer to the tang, but many examples can be found where the widest point is in the middle or even closer to the tip.

6.1.2.2. Long

Long blades have edges which are parallel to the center of the blade, giving them a constant width for some amount of their length. Sometimes, particularly when the shoulders are barbed, the sides appear to be slightly concave or waisted.

6.1.2.3. Triangular

Triangular blades have straight edges from the tip to the shoulders, rather than the curved edges of normal blades. The shoulders are depicted as rounded in Figure 6.2 for the sake of comparison, however in practice, this combination is never attested.

6.1.2.4. Ogee

Ogee blades are characterized by a small, acute point at the very tip. Below this small tip, the edges follow a more conventional curve. The purpose of the small point was perhaps to aid in the initial penetration of the target. The energy would be focused into a very small area, which would have helped the arrowhead puncture the target. Then the wider convex area would widen the wound and cause greater bleeding. However, such a small tip would be much more prone to breaking off on impact than a normal point, and so were mostly likely intended to be used for softer targets. Ogee arrowheads clearly follow a Late Bronze Age tradition, as the form is amply attested in the later part of the 2nd Millennium BC.[3]

[2] Cross & Milik 1956, p. 17
[3] For example, at el-Khadr in Palestine; see Cross & Milik 1956.

6.1.2.5. Extended Ogee

Extended Ogee blades have a long, acute point extending a large proportion of the blade until it merges with a wider, rounded lower portion. Extended ogee arrowheads invariably have rounded shoulders.

6.1.2.6. Pentagonal

Pentagonal blades have, in effect, two sets of shoulders. The top of the blade is fairly acute and generally essentially triangular (even slightly concave). Below this is an angled shoulder, normally more than half way down the blade (so the upper portion is generally longer). A second shoulder at the bottom leads back to the tang. The upper shoulder is always more or less angled, but the lower shoulder can be of a variety of types, therefore it is the lower shoulder that is significant for assigning a type to a pentagonal arrowhead.

6.1.2.7. Rounded

Rounded tips have a gentle curve where the sharp point of the arrowhead would normally be. The curve of the tip merges into the curves of the blades. Combined with rounded shoulders, this gives the arrowhead a very ovoid profile.

6.1.2.8. Chisel tip

Like rounded blades, chisel tip blades have a curve where the point would be. However, the curve of the chisel tip has a much greater radius, and so it is not possible for the curve of the tip to merge into the curves of the side, as with rounded blade. All attested examples have sharply concave shoulders.

6.1.3. Sections

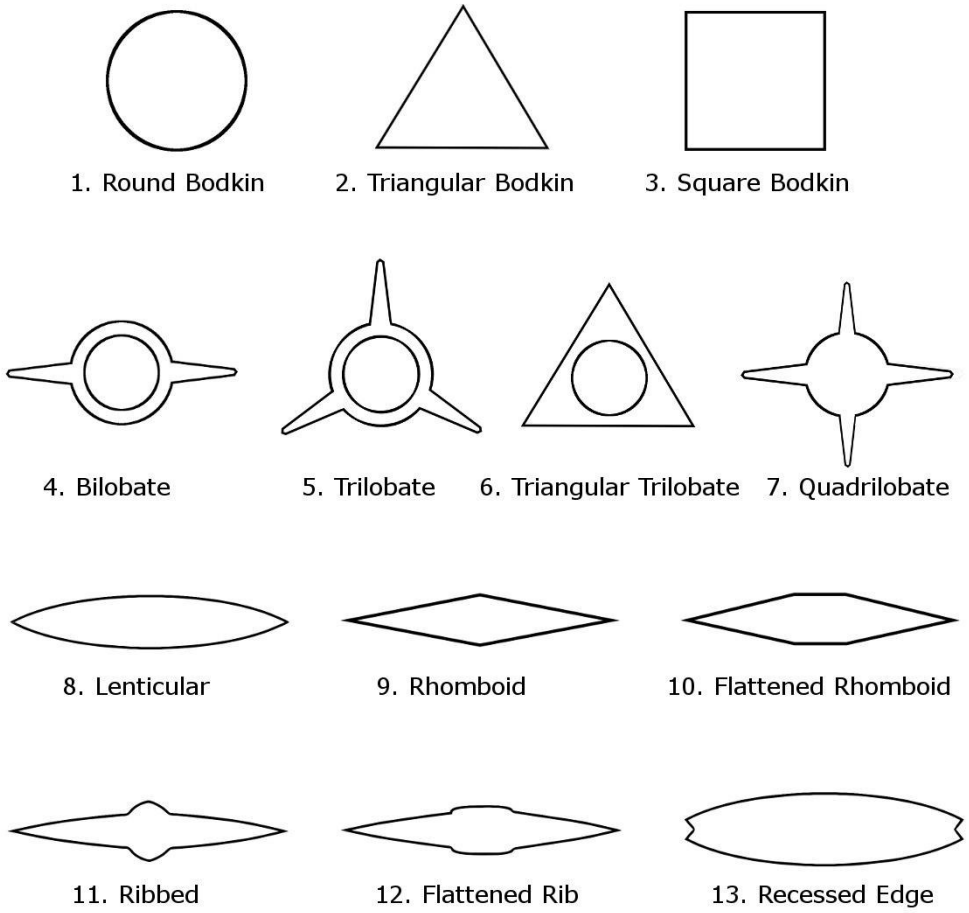

Figure 6.3: Arrowhead sections.

6.1.3.1. Round bodkin

Round bodkins have the basic form of a cylindrical cone, so their section is circular.

6.1.3.2. Triangular bodkin

Bodkins with triangular sections, while a theoretical possibility, are not attested in the sample collected for this study (though cast bronze triangular trilobates are), and their absence may be explained by several practical factors. They would have had relatively high longitudinal strength compared to their weight. However, as weight is also a necessity in armor piercing, they are not so common as square bodkins. Triangular bodkins would have also been more difficult to forge than square ones, since while square bodkins could be hammered on a flat surface, triangular ones would require a matching triangular groove into which the opposite two faces could be places while working

on one of the faces, in order not to crush them. Triangular bodkins could be case in bronze as easily as square or round ones, however they are not attested.

6.1.3.3. Square bodkin

Square bodkins are the most common form of bodkin, enabling an arrowhead to have a great deal of mass relative to its section, thus optimized for armor penetration.

6.1.3.4. Bilobate

Bilobates are sockets with two blades opposite each other. Their sections are similar to those of ribbed arrowheads, except that some portion of the socket is hollow.

6.1.3.5. Trilobate

Trilobate arrowheads possess three individual blades radiating from the core of the arrowhead at 120º intervals.

6.1.3.6. Triangular Trilobate

Triangular trilobates are essentially a crossbreed of the trilobate and the triangular bodkin. The blades are made much thicker than those of a trilobate, until the section is triangular, or nearly so. However, their heritage is clear, since they invariably possess sockets, as do trilobates. It is likely that this was an adaptation of trilobate arrowheads to aid them in piercing armor.

6.1.3.7. Quadrilobate

Quadrilobates have four blades radiating from the central core at 90º intervals.

6.1.3.8. Lenticular

The majority of iron arrowheads have lenticular sections. Lenticular blades would be relatively easy to forge, rolling the piece slightly as one works towards the edge.

6.1.3.9. Rhomboid

Rhomboid arrowheads have flattened faces, which produces a distinct peak or line running the length of both faces of the blade. This edge did not serve any practical function, but may have been desirable for aesthetic reasons.

6.1.3.10. Flattened rhomboid

Flattened rhomboids differ from rhomboids in that the highly obtuse edge running down each face of the arrowhead was flattened into an additional face, resulting in a six-sided section.

6.1.3.11. Ribbed / Bilobate

Arrowheads were given ribs – a raised area running down the centerline of the arrowhead - in order to increase their longitudinal strength. Thin blades would have a tendency to bend or break upon impact, though their thin section would aid in cutting. The rib provides longitudinal strength without adding significantly to the area of the section.

6.1.3.12. Flattened ribbed

Flattened ribbed arrowheads are, as the name indicates, those which have the rib flattened, creating a flat face. Since the radius of the rib would be less than in a normal rib, it is possible that these did not provide quite as much longitudinal strength.

6.1.3.13. Recessed Edges

Recessed edges are very rare, and are only found in conjunction with lenticular sections. They are characterized by a sharp, inward groove where the edge of the blade would normally be. The arrowhead would therefore have two parallel cutting edges. This would have been a difficult feature to create, however. If forged, the original edge would probably have to be filed away and then the groove chiseled in, though a possibly simpler solution would be to make two identical arrowheads half as thick as the desired final product and then weld them together, face to face, but avoid hammering the very edges fully together. They would also be extremely difficulty to cast, since any undercut of the kind necessary would prevent the casting from being removed from the mold. Thus a far more complicated, multi-part mold would be required. Most likely, cast examples were also cold-worked with files and chisels.

6.1.4. Shoulders

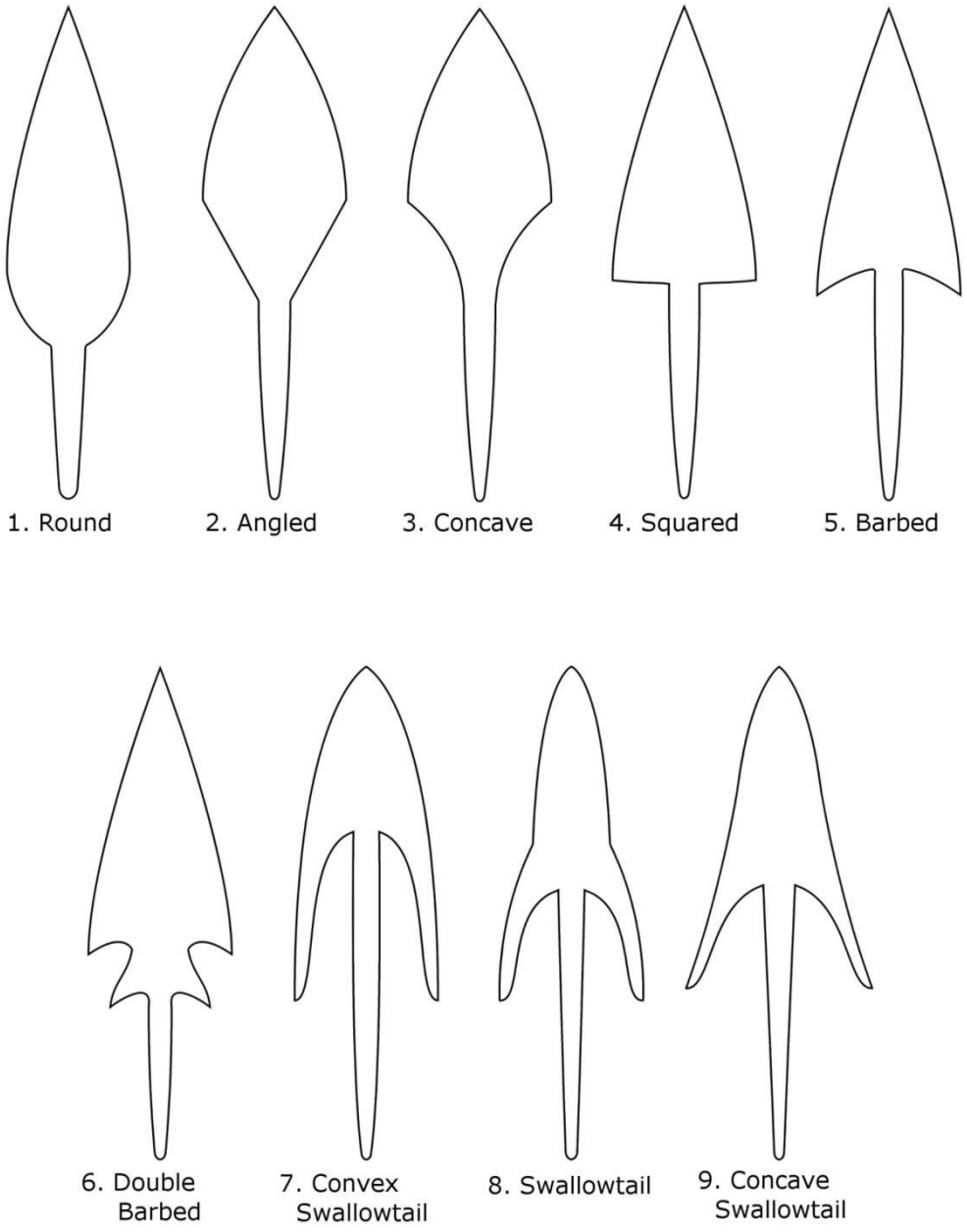

Figure 6.4: Types of shoulders.

6.1.4.1. Round

Round shoulders, where the blade curves more or less gently back towards the center of the blade, are the most common form of shoulders.

6.1.4.2. Angled

Angled shoulders follow a straight line as they angle back towards the center of the arrowhead. Thus, there is a sharp corner where the blade edges and shoulders meet.

6.1.4.3. Concave

Concave shoulders are the opposite of rounded shoulders, and their convex curvature creates a sharp corner where the shoulder and blade meet.

6.1.4.4. Squared

Squared shoulders are perpendicular to the centerline of the arrowhead. The flat line they form could have served as a makeshift stop, and could have also somewhat impeded the withdrawal of the arrowhead from a wound, much as barbs would.

6.1.4.5. Barbed

Barbed shoulders are created by a convex curvature back towards the core of the arrowhead, resulting in two sharp, downward points. These points served to make it difficult to withdraw the arrowhead from a wound.

6.1.4.6. Double Barbed

Double barbed shoulders have two sets of barbs, one below the other. It is not clear if these had a function beyond aesthetics, but their extreme rarity suggests that aesthetics was their primary purpose.

6.1.4.7. Swallowtail

Swallowtail arrowheads are characterized by long extensions both sides of the bottom of the blade, like highly exaggerated barbs (which Negahban refers to as "jetlike wings"[4]). The tails are typically at least half the length of the rest of the blade – in some cases, they are actually longer than the rest of the blade (for example, Marlik 5).

The barbs on barbed arrowheads are typically quite small relative to the size of the blade, however there is a grey area where barbed and swallowtail arrowheads could overlap. Unfortunately, this requires a somewhat arbitrary rule to differentiate them. I therefore propose that if the tail of the blade is longer than 1/3 the length of the rest of the blade, it qualifies as a swallowtail.

[4] Negahban 1996, p. 277

The purpose of the tails is likely different from that of barbs. Barbs clearly serve the sole function of inhibiting the withdrawal of the arrow from the target. The great length of the tails, however, would necessitate a deeper penetration of the target relative to the weight of the arrowhead in order for the ends of the tails to be within the target, and thus able to prevent withdrawal. Their primary function was more likely to give the arrowhead a very long and wide cutting surface without making it too heavy. If the area between the tails was filled in with solid metal, some swallowtail arrowheads would nearly double in weight. Furthermore, since the width of the arrowhead is spread over a long edge, it allows the arrowhead to remain fairly acute, aiding penetration. A shorter arrowhead with comparable width would have to have a far more obtuse point.

The great width of swallowtails relative to their weight would have made them less suitable for use against armored targets, and perhaps of less utility in combat in general. Nearly identical arrowheads were used in medieval Europe,[5] where they were employed for hunting. This is the most probable intended use of the ancient Near Eastern examples as well.

The three different kinds of swallowtails have been assigned three distinct categories:

6.1.4.7.1. Convex Swallowtail

Convex swallowtail shoulders are essentially substantially lengthened barbs. The curve of the edges is convex for the entire length of the blade (though the lower portions may be nearly straight).

6.1.4.7.2. Swallowtail

The edges of swallowtail arrowheads have compound curves. The upper portion is fairly acute, but lower portion, containing the extended barbs, has a more obtuse curvature.

6.1.4.7.3. Concave Swallowtail

Concave swallowtail arrowheads resemble regular swallowtails, except in that the curvature of the edges of the lower portion is concave rather than convex.

[5] See Jessop 1996, fig. 1

6.1.5. Tangs

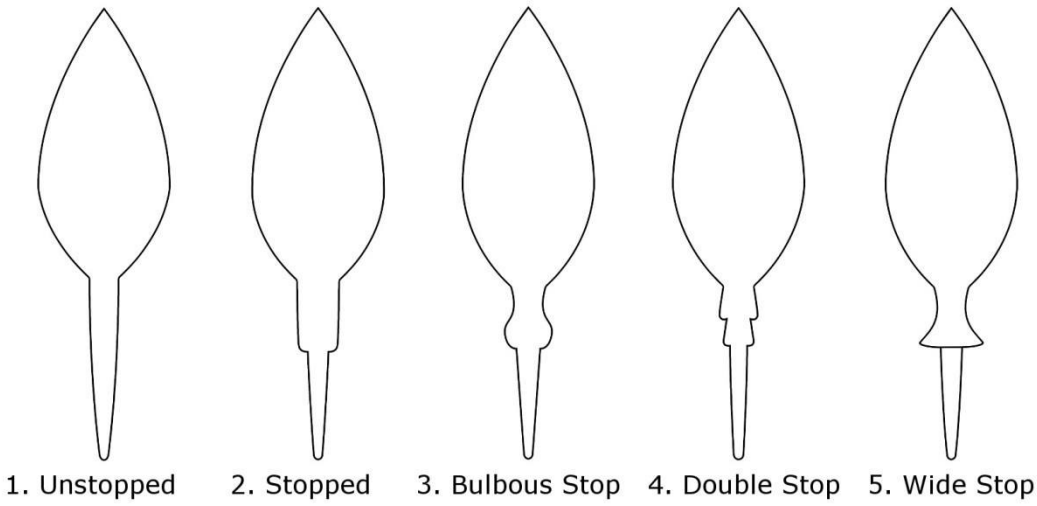

Figure 6.5: Types of tangs.

6.1.5.1. Unstopped

Unstopped tangs have generally taper slightly towards the end of the tang, without any specific feature for the arrow shaft to rest against.

6.1.5.2. Stopped

The normal stop is formed by the difference in diameter between the stem and the tang, providing a reasonably flat, circular area for the forward end of the arrow shaft to rest against. The stop helps to prevent the arrow shaft from sliding up over the arrowhead and cracking on impact.

6.1.5.3. Bulbous Stop

Bulbous stops are roughly spherical and noticeably wider than the stem. They may have been useful when the arrow shaft was significantly wider than the stem of the arrowhead, though the entire stem could also be made wider to accommodate a wider arrow shaft. It is therefore likely that the bulbous stop was used as least partly for aesthetic reasons.

6.1.5.4. Double Stop

Double stops appear to have been primarily decorative, since the lower of the two stops should have been sufficient for practical purposes. It is doubtful that an arrow shaft, having cracked and driven up the arrowhead past the first stop upon impact, would be halted by the second stop. Even if it was,

much of the impact energy would have already been absorbed by the cracking and movement of the arrow shaft.

6.1.5.5. Wide Stop

Wide stops flare outward from the stem, and their lower face is generally very flat. This form of stop would have also been useful in cases where the stem was narrower than the shaft, or when a particularly thick (and therefore heavy) shaft was being used.

6.2. Arrowhead materials

The two primary materials for arrowheads in the early 1st Millennium BC were bronze and iron. Bone also appears to have been used on a very limited basis for arrowheads. Stone was no longer used for arrowheads by the 1st Millennium BC.[6] While it is true that an obsidian point can be given an edge far sharper than any metal, the brittleness of the stone makes it far less suited to use as an arrowhead than metals. The only blades made of chipped stone attested in the Near East during Iron Age are for sickles,[7] so by that time, metal had completely replaced stone for the manufacture of arrowheads in the Near East. Indeed, it appears that even in times of urgency when arrowheads needed to be rapidly made from limited resources, metal was still used, such as in the case of the Type 5a-1 arrowheads from Nimrud.

6.2.1. Bronze

Bronze was the material of choice for arrowheads throughout the 2nd Millennium BC, and while it was largely replaced by iron around the beginning of the 1st Millennium BC, it made a massive resurgence with the widespread use of socketed bronze arrowheads starting around the 7th Century BC.

As the vast majority of artifacts have not been subjected to metallurgical studies, their exact compositions are unknown. Since objects made of copper alloys are attested far more frequently than those of pure copper in the early 1st Millennium BC, the term "bronze" is used in this work to refer to any copper-based item, whether it is actually composed of a copper alloy or pure copper. When the actual metallurgical composition of an item is known, more precise terms are employed.

Arsenical bronze was the most common copper alloy in use from the 4th Millennium BC to the early 2nd Millennium[8], but by the early 1st Millennium BC it had been nearly completely replaced by

[6] One agate arrowhead was found in Hasanlu IVB, dating to the 8th Century BC, however Thornton & Pigott state that it "is probably an heirloom;" Thornton & Pigott 2011, p. 146, fig. 6.7.
[7] Rosen 1997, p. 373
[8] Moorey 1994, p. 250

copper/tin bronze.[9] Craddock & Giumlia-Mair speculated that what arsenical bronze is attested in the 1st Millennium BC may be the result of older objects being recycled.[10] Copper with up to 15% arsenic can occur naturally,[11] so some arsenical bronze may be natural rather than deliberately produced. Copper with high arsenic concentrations had particular aesthetic appeal, since it produced a silvery finish that was more resistant to tarnishing.[12] In structural terms, the ideal content to maximize the malleability and hardness of an object is roughly 4 to 8%, however a copper/tin bronze with only 3-4% tin would normally exhibit superior characteristics to those of the arsenical bronze,[13] which suggests why copper/tin bronze eventually became the preferred alloy.

While copper can have natural traces of tin, copper with over 2-3% tin is generally regarded as a deliberate alloy,[14] and the more usual proportions for alloying are generally closer to 10% tin to 90% copper (see below). This, incidentally, closely reflects the proportions of copper to tin ingots found on the late 2nd Millennium BC shipwreck at Ulu Burun (ca. 10 tons copper to ca. 1 ton tin).[15] This suggests that the raw materials were not normally mixed together into bronze by those who produced the metals, but rather by those who cast the finished products, allowing them to mix the proportions as appropriate for each application.

In a survey of "top quality" 1st Millennium bronze artifacts from the Near East and the Mediterranean, Craddock found that objects made of hammered sheet bronze generally had a tin content of roughly 10%, while cast objects had somewhat less, ca. 7-8% (low quality artifacts often displayed much more random compositions).[16] This finding is borne out by the Nimrud Bowls, perhaps the largest collection of Assyrian bronze objects with known compositions. All of the approximately 140 examples are made of copper/tin bronze, with tin concentrations of 8% to 13% with 0.1% to 2.5% lead.[17] The fittings of these vessels – handles, rivets, etc. – contain significantly lower tin content than the bowls themselves, suggesting that the bronze smiths deliberately manipulated the alloys to ensure that the vessels were tough and resilient, while the fittings were allowed to be softer (and thus use less costly tin).[18] The concentration of lead, however, was similar in all elements of the vessels.[19] Other small bronze items from Nimrud (mostly cast items, such as arrowheads, fish hooks, fibulae

[9] Craddock & Giumlia-Mair 1988, p. 318
[10] Craddock & Giumlia-Mair 1988, p. 318
[11] Moorey 1994, p. 250
[12] Moorey 1994, p. 250
[13] Northover 1989, p. 114
[14] Moorey 1994, p. 242
[15] Pulak & Bass 1996, p. 266
[16] Craddock & Giumlia-Mair 1988, p. 318-319
[17] Hughes *et al* 1988, p. 312
[18] Hughes *et al* 1988, p. 312
[19] Hughes *et al* 1988, p. 312

and weights) had slightly higher concentrations of lead, typically 1-2% and as high as 3% on occasion.

Lead was sometimes added to copper or copper alloys to increase the fluidity of the molten metal,[20] aiding the casting process. Cast copper/tin bronze objects from the early 1st Millennium BC often exhibit some degree of lead content, however, while the ideal proportion for maximizing fluidity is 2% lead, artifacts often exhibit a considerably greater lead content than 2%.[21] Craddock & Giumlia-Mair speculated that the additional lead was essentially "filler," taking the place of more costly copper and tin and thus reducing production costs.[22]

Eight copper arrowheads from Lachish were analyized metallurgically; seven were of essentially pure copper and while the eighth (number 5, 45512/60) had 13.6% tin.[23] Of those, the arrowheads that are included in this study (Lachish 79, 80 & 81, respectively numbers 3, 4 and 7 in Gottlieb's analysis) are all of the pure copper variety. Lachish 79 and 81 date to ca. 900-800 BC and Lachish 80 to ca. 800-700 BC, thus some un-alloyed copper arrowheads were in use during the Neo-Assyrian Period.

6.2.2. Iron

Iron began to be worked in Assyria in the late 2nd Millennium BC[24] and seems to have become fairly widespread in the early 1st Millennium BC.[25] Indeed, iron came to largely replace bronze as the primary metal for arrowheads (and other weapons[26]) around the beginning of the 1st Millennium BC, until it was itself partially replaced again by bronze with the advent of socketed arrowheads in the 7th Century BC. A 12th Century BC metal workshop uncovered at Tell Ta'yinat contained evidence of both bronze and iron production,[27] indicating that, at least in the Early Iron Age, both of these metals were worked together rather than in separate industries. This may be one reason why some iron arrowheads appear to deliberately mimic the form of bronze arrowheads and vice versa.

Even if bronze and iron were worked together, they have very different properties. When smelting copper, the furnace was able to melt the metal out of the ore, and the only real variables were the ore used, the ratio of fuel to ore, and the furnace. If these variables remained constant, the copper smelter could generally produce a fairly consistent product. The smelting of iron was far more complex than the smelting of copper since there were far more variables involved – such as the exact temperature of

[20] Craddock & Giumlia-Mair 1988, p. 319
[21] Craddock & Giumlia-Mair 1988, p. 319
[22] Craddock & Giumlia-Mair 1988, p. 319
[23] Gottlieb 2004, pp. 1963-1964
[24] The earliest textually attested iron arrowheads date to Tiglath-Pileser I; Curtis 2013, p. 39.
[25] Curtis *et al* 1979, p. 369
[26] Curtis *et al* 1979, p. 384
[27] see Harrison 2011

the furnace as well as carbon and phosphorus content of the ore[28] - and doubtless this is the principle reason that the development of ironworking took so much longer than the development of bronze working. [29]

Another obstacle to producing pure iron was that reduction temperature (1200° C) was below the melting point of bloom iron, so the silicates rather than the metal would be melted out of the ore. The result is a "spongy" mass of iron with slag and fuel inclusions.[30] In order to purify such a bloom, it needed to be repeatedly heated (and thus using more charcoal) and hammered in order to consolidate the metal and force the impurities out.

Adding carbon to iron makes it both harder and more resilient, both essential qualities for most sorts of weapons and tools. Perhaps even more importantly, steel can be hardened and tempered while iron cannot.[31] Iron with a carbon content of 0.5% to 1.5% is considered steel[32] (though Moorey cautions that before about 200 BC, it should really be considered "carburized iron" rather than actual steel[33]) and its much greater resilience while at the same time taking a sharper edge in comparison to iron made it ideal for weapons. Iron with a greater proportion of carbon – from 1.5% to 5% - is cast iron.[34] This larger carbon content reduces the iron to its lowest possible melting point (the eutectic point being 4.26% carbon with a melting point of 1150° C[35]), which allowed it to be melted in ancient furnaces and cast in molds. Cast iron is very brittle, however, which makes it an impractical material for weapons or tools. In any case, cast iron does not appear to have been used in the ancient Near East,[36] first appearing in mid to late 1st Millennium BC in China.[37]

Since iron produced in antiquity could absorb some amount of carbon from the charcoal fires in which the iron was smelted and forged (primary carburization),[38] it is not always possible to tell if the carbon content in an iron or steel object is the result of intentional metallurgy or simply a chance product of the manufacturing process. Coghlan suggested that the surface carburization could have taken place in the forge itself,[39] however Piaskowski observed that forge fires tend to be oxidizing rather than

[28] Moorey 1994, p. 283
[29] Moorey 1994, p. 282
[30] Moorey 1994, p. 281
[31] Coghlan 1956, p. 56
[32] Moorey 1994, p. 278
[33] Moorey 1994, p. 283
[34] Moorey 1994, p. 278
[35] Leslie & Hornbogen 1996, p. 1565
[36] Moorey 1994, p. 278
[37] Moorey 1994, p. 285. Cast iron artifacts dating to the 4th Century BC have been found in China, and textual references suggest that cast iron objects were being made in the late 6th Century BC; Needham 1980, pp. 515-517.
[38] Moorey 1994, p. 278 & Piaskowski 1991, pp. 80-81
[39] Coghlan 1956, p. 56; see also Pigott 1980, p. 432

reducing (given that they normally have a strong draft of air being blown into them to raise the temperature), which would tend to inhibit rather than encourage carburization.[40] Pleiner found, by means of experimental archaeology, that portions of the bloom sheltered from the air flow coming from the tuyères and thus oxidized to a lesser degree at times had sufficient carbon content to qualify then as steel, whereas the oxidized iron near the mouth of the tuyères tended to have a significantly lower carbon content.[41] Thus a bloom could be very heterogenous, even more so since the heat and duration of the fire, the qualities of the iron ore, and amount of fuel, slag, and other impurities caught in the bloom could all affect its properties.

Smiths of the early 1st Millennium seem to have recognized that their iron could have a wide variety of working properties, which may be the reason behind the curious form of the iron "ingots" or *Spitzbarren* found at Khorsabad, Nimrud, and as far away as La Tène sites in Europe.[42] These iron bars had one end drawn out into a kind of chisel-like point, the other end typically blunt, and usually a hole bored through the center (though not always bored completely through, and not always centered).[43] Both Pleiner[44] and Curtis[45] dismissed the possibility that they were used as some kind of tool. Some could indeed have been used as tools with very thin handles, however others clearly could not have been because they have irregular or incomplete holes.[46] They seem more likely have been intended to exhibit the working qualities of the individual ingot of iron, necessary because of the great variation possible in these properties. The drawn-out chisel blade would show the ductility of the metal and perhaps its ability to take an edge, and the holes presumably showed how well the metal could be drifted or bored.

Secondary carburization (or cementation) of an iron ingot or object could be carried out by heating the iron to a very high temperature for a certain amount of time in a reducing atmosphere in the presence of a carbon source (charcoal).[47] As with primary carburization, there is some debate as to whether it was done deliberately or was merely a by-product of the forging process. Rehder argued that iron cannot be carburized simply by being heated in a charcoal fire, such as a forge, since it must be sealed to prevent oxidation.[48] However, he himself stated that iron can be carburized in smelting furnaces,[49] where the metal is no less protected from oxidization. One may consider Pleiner's experiment, mentioned above, which showed that areas of a bloom furnace sheltered from the blast of air would be

[40] Piaskowski 1991, p. 81
[41] Moorey 1994, p. 282
[42] Curtis *et al* 1979,p. 389
[43] Curtis *et al* 1979, pp. 389-390
[44] Pleiner 1979, pp. 90-91
[45] Curtis *et al* 1979, pp. 389-390
[46] Curtis *et al* 1979, p. 390
[47] Coghlan 1956, p. 56
[48] Rehder 1989, p. 27
[49] Rehder 1989, pp. 28-29

sufficiently protected from oxidation to carburize to some extent. One would imagine that the same process would work equally well in a forge, and that if, intentionally or unintentionally, a smith heated a piece of iron in a part of the forge that was hot yet not in the direct blast of air, the object could be carburized to some degree. Wagner also observed that 18th century Norwegian experiments (repeated and verified in the 1970s) showed clearly that steel could be produced in a forge.[50] Congdon described an early modern technique to effectively case-harden blades by rubbing them in tallow and then heating them;[51] while this technique was not attested in the ancient Neat East, it would have been possible with the technology available to them.

It is also possible to carburize an object via lamination (or piling), that is, welding together pieces of iron of varying carbon content together. However, as Moorey observed,[52] the consolidation of a heterogenous iron bloom would produce similar laminations, so again it is not possible to determine if the lamination was deliberate or a by-product of the production process, particularly as the layered structures that may identify lamination can also be produced by phosphorus segregation.[53]

Pleiner observed that the Neo-Assyrian tools he examined lack the high carbon edges that they would certainly possess if carbon content could have been effectively manipulated, which strongly suggests that, in this period, it could not.[54] The Neo-Assyrian ironwork examined by Curtis *et al*, with low carbon content or no significant carbon at all, further strengthens the notion that Assyrian blacksmiths did not deliberately carburize their iron.[55] They did suggest that at least one object – an iron hoe from Khorsabad – did absorb some carbon via repeated heating,[56] though whether or not this was intentional is impossible to tell.

Few iron arrowheads have been subjected to metallurgical analysis. Ten iron arrowheads from Lachish were studied metallurgically, none of which exhibited any trace of either carburization or of quenching.[57] One arrowhead from Fort Shalmaneser in Nimrud (arrowhead Nimrud 249 in this work) was sawed in half for a sample, and was found to be sufficiently carburized to be low-carbon steel.[58] The tip of an arrowhead from Toprakkale was found to have two zones, one of non-carburized iron and another with a homogenous content of 0.2% carbon.[59] Curtis *et al* presumed that having such a high carbon content in the core indicates that the piece was most likely deliberately carburized and

[50] see Wagner 1990
[51] Moorey 1994, p. 284
[52] Moorey 1994, p.284
[53] Piaskowski 1991, p. 79
[54] Pleiner 1979, pp. 90-91
[55] Curtis *et al* 1979, p. 385
[56] Curtis *et al* 1979, p. 377
[57] Gottlieb 2004, pp. 1964-1965
[58] Curtis *et al* 1979, pp. 377-378
[59] Curtis *et al* 1979, pp. 385-386; BM 1931-4-11, 9

that the outer portion of the arrowhead, now corroded away, would have had an even higher carbon content.[60] Why there was also a non-carburized zone in the same object is not addressed by Curtis *et al*. It could have resulted from two different pieces of iron being used to build up the arrowhead by welding or it could indicate that despite one zone having a homogenous carbonization, the artifact as a whole is *not* homogenous, suggesting that the carburization was indeed unintentional.

Piaskowski & Wartke analyzed two further 7th Century BC arrowheads from Toprakkale, which proved to be of iron with very little phosphorus and with carbon content varying between 0.2% to 0.8% in one and up to 0.7% in the other.[61] Thus the arrowheads could be considered very low carbon steel, but the irregular structure of the arrowheads – with portions of significantly higher carbon content than other portions – suggests that the carbon content was not deliberate, but rather the result of using a heterogenous bloom.

Thus the evidence argues against early 1st Millennium BC smiths being able to effectively manipulate the carbon content of iron objects, nor, as the tools examined by Pleiner indicate, did they make effective use of iron that had different amounts of carbon (such as using high carbon pieces for cutting edges). Piaskowski also warns that those examples put forth as evidence of cementation are questionable as "objective structural criteria" were not used in their analysis.[62] A definitive study, therefore, would need to establish such objective criteria and re-examine all previously studied pieces.

6.2.3. Sources of metals

Mesopotamia was lacking in natural sources of copper, tin and iron, which meant that the raw materials for metalworking needed to be imported. The Assyrians obtained these materials either by trading for them, or as tribute or booty.

Perhaps the most important source of copper for Assyria was the relatively nearby mountains of eastern Anatolia,[63] though both Iran and Cyprus have large copper deposits and may have been significant suppliers as well.[64] Babylonia may also have still received imports of copper from farther afield via the Persian Gulf.[65]

[60] Curtis *et al* 1979, p. 386
[61] Piaskowski & Wartke 1989, p. 106; both were selected from VA 15353, a collection of 102 tanged iron arrowheads; see Wartke 1990, p. 132 (#317)
[62] Piaskowski 1991, p. 81
[63] Moorey 1994, p. 246
[64] Moorey 1994, p. 247
[65] Moorey 1994, p. 246

Tin was also imported from Iran, the area around Urartu (the Nairi-lands), and the Persian Gulf.[66] Tin appears to not have been imported from Anatolia - indeed, Assyria exported tin received from other sources to Anatolia in the Old Assyrian period, [67] though late 2nd Millennium BC Hittite documents mention tin being produced in Cilicia.[68]

Sources of Iron were rather more widespread than those of copper and tin. Easily-accessible iron ore was reported just north of Mosul, at a distance of no more than three or four days of travel,[69] though whether this source was exploited in antiquity is not known. Neo-Assyrian sources mention several sources from which iron was imported, primarily the mountainous areas of eastern and southern Turkey, but also from the Khabur region and from Damascus.[70] Sites mentioned as sources of iron tribute were not necessarily iron-producing sites; some, such as Damascus, were more likely centers which gathered iron from surrounding regions or by trade. Tylecote suggested the iron-rich sands on the Turkish coast of the Black Sea as a possible ancient iron source.[71]

Tribute and booty were a significant source of metals for the Assyrian Empire, and while accounts of tribute and booty received must be viewed critically – sometimes very different amounts of metals received were recorded in differenct sources for the same event[72] – they can still provide some notion of the relative importance of metals and the sources where they were most abundant.

The most frequently mentioned type of booty in Assyrian annals are copper (or copper-alloy) objects, [73] which attests to their value. However, as Walker observed, even when large amounts of bronze or copper are taken as booty or tribute from an area, that area should not necessarily be regarded as a primary supplier of that material.[74] Iron was also frequently received in tribute or as booty, and is normally recorded as a raw material and measured in talents.[75]

Besides receiving them as tribute and booty, the Assyrians must have also traded for copper, tin, and iron, though whether they traded with the producers of the metals directly or with middle men is unknown. Booty and tribute may be over-emphasized as sources of raw materials for the Assyrians, however it must be remembered that the majority of surviving sources were produced by the Assyrian state, and therefore reflect the point of view of the Assyrian state (and even then, there are

[66] Moorey 1994, pp. 298-299
[67] Moorey 1994, p. 298
[68] Moorey 1994, p. 299
[69] Maxwell-Hyslop 1974, p. 139
[70] Maxwell-Hyslop 1974, pp. 147-152
[71] see Tylecote 1981
[72] Pleiner & Bjorkman 1974, p. 292
[73] Moorey 1994, p. 246
[74] Walker 1988, p. 111
[75] Pleiner & Bjorkman 1974, p. 292

considerable variations from reign to reign and even from scribe to scribe, as Walker indicated[76]). Private transactions – such as the purchase of copper and tin by private Assyrians – are, because of the nature of the surviving sources, poorly attested, however that does not mean that they did not play a major role in the Assyrian economy. One of the few exceptions to this situation is a letter from a governor of a western province to Sargon II, responding to an allegation of that king that "the people have been selling iron for money to the Arabs."[77] The author responds that he sells iron only to deportees and copper to the Arabs.[78] This is interesting since it both attests that there was private trade in metals taking place (with even high officials taking part), yet that iron was apparently nevertheless considered a strategic resource and not to be allowed to certain peoples. A further example of private trade in iron is a text which mentions that royal smiths have embezzled the iron they were given to work and sold it in Kalhu.[79]

Individuals certainly used copper (though apparently not iron) as payment for goods.[80] Where they obtained these metals, presumably in the form of ingots (they are normally quantified simply by weight), it not stated. Tin seems to have been somewhat rarer than copper or iron, since a number of purchase contracts state that, should the purchaser contest the contract, he must give one full talent of tin to the governor of his city, as well as other extremely expensive items (such as horses) to various religious and secular establishments and also returning the money either tenfold or one hundredfold to the original owner.[81] While a talent is, of course, a large quantity (approximately 30 kg[82]), the fact that tin is referenced alongside these other very valuable items certainly indicates that tin was also a commodity of particular value.

The Assyrian state may have also used its stores of metals derived from booty and tribute – such as the enormous hoard of iron objects, including hundreds of ingots, found at Khorsabad by Place[83] – as a de facto currency for making purchases. They certainly also used them as raw materials for their own craftsmen,[84] such as those at the armories, who may well have made arrowheads used by the Assyrian military.

[76] Walker 1988, p. 112
[77] SAA I 179, 22-23
[78] SAA I 179, r1-r2
[79] SAA XVIII 115, 2-9
[80] e.g. SAA VI 2, 6; SAA VI 19, 7; SAA VI 32, 8
[81] e.g. SAA VI 6, 12; SAA VI 11, r5; SAA VI 20, r1; SAA VI 32,r3; SAA VI 42, 20
[82] Huehnergard 2000, p. 580
[83] Curtis *et al* 1979, p. 371
[84] e.g. SAA XVIII 115, 2-9, where smiths were given iron by the king to do work (and subsequently embezzled it).

6.2.4. Bone and wood

Wood arrowheads are not attested in the Neo-Assyrian Period, though they could plausibly have been used. A text from Mari mentions wood-tipped arrows,[85] and a number of actual examples were found in the tomb of Tutankhamon,[86] so they were certainly used in the 2nd Millennium BC.

Bone was not commonly used as a material for arrowheads, though it is attested at Marlik, Karchaghbyur, Hasanlu, and Lachish.[87] Far lighter and more easily broken upon impact than even stone, and therefore would likely have been of little utility in combat. They may have merely served as low cost and easy-to-manufacture alternatives to metal. One advantage they would certainly possess over metal arrowheads is that bone was a cheap and readily-available material.

Bone spatulae are rather more common than bone arrowheads, however, and their similarity in form can lead to confusion between the two. Spatulae are often slightly curved along their length, which would render them unsuitable for arrowheads, though what their original purpose was is a matter of some debate.[88] Straight bone points could, in many cases, serve as either form of item.

6.3. Manufacturing techniques

6.3.1. Cold forging

Cold forging is the most basic of manufacturing techniques for both iron and bronze objects. Leaving the metal at the ambient temperature, the object is simply hammered into the desired shape by brute force. However, when metal is hammered while cold, it becomes work-hardened, that is, compressed on the molecular level, causing it to grow harder and more brittle, until the point where any further work will cause the piece to crack, destroying it and obliging the smith to start over from the beginning.[89] The metal can have its plasticity restored via annealing, whereby the object is heated past the recrystallization temperature and then allowed to slowly cool if it is iron, or quenched quickly if it is bronze.[90] Clearly, if the smith possessed the capacity to heat the object sufficiently to anneal it, he could simply also work it while hot, saving both time and effort. Nevertheless, some cold forging of the cutting edges of a blade could be performed in order to work-harden them, enhancing their hardness (see §6.3.4).

[85] Miller *et al* 1986, p. 190
[86] e.g. McLeod 1982, pp. 13-16 (nos. 48, 51, 52, 54 & 55)
[87] No bone-tipped arrows were found in the tomb of Tutankhamon, but ivory-tipped ones were; McLeod 1982, p. 24 (no. 75)
[88] see van Beek 1990
[89] Coghlan 1951, pp. 74-75
[90] Maryon 1949, p. 94

6.3.2. Hot forging

There are examples of hot-forged bronze objects,[91] however bronze is not well-suited to hot-forging. Bronze becomes very brittle and is likely to shatter upon being stuck when red hot, [92] especially when the concentration of tin is over 8%.[93] Furthermore, 1st Millennium BC forges were capable of reaching temperatures that could melt bronze, therefore a smith would have to exercise caution even when heating a bronze object in order to anneal it lest he accidentally heat it too much and melt the piece.

Iron, on the other hand, is ideally suited to hot forging. As it grows hotter, it changes color regularly, allowing the smith to accurately gauge its temperature. When heated above its recyrstallization temperature (conveniently indicated by a red color), iron is quite plastic and can be worked indefinitely. It can be hot-worked over a wide temperature range, from ca. 700º C - 1250º C,[94] which means that a piece heated to the upper end of that range could be worked for some time before needing to be returned to the fire. Furthermore, ancient forges could not reach a temperature sufficiently high to melt iron, so the smith did not need to worry about accidentally destroying his work. The process of hot forging had the additional benefit of helping to work out any slag that remained in the iron after smelting. Slag inclusions can be a major source of weakness in iron objects, so the removal of as much slag as possible is of the utmost importance for high-quality iron implements.

Another tremendous advantage of hot forged iron over bronze is that two or more pieces of iron can be welded together in a forge by heating them to a sufficient temperature, placing the surfaces to be welded in contact, and hammering them together. This fuses the faces of the iron together, and if correctly carried out, results in a joint as strong as the metal itself, since the two pieces of iron have essentially merged into a single piece. Welding allows iron objects to be built up out of smaller pieces of iron. Furthermore, broken iron items can be welded back together, whereas bronze objects must be completely re-cast when broken. However, whether iron smiths did indeed weld iron in the early 1st Millennium BC is a subject of some debate.

Piaskowski identified three different types of welding: “structural welding,” for consolidating an iron bloom, “constructional welding” for assembling an object by combining two or more pieces of iron (or by attaching two parts of a single item together, such as when joining the ends of a bent iron rod to make a ring), and “technological welding” for combining pieces of iron with different characteristics

[91] E.g., a bronze Luristan dagger with a hot-forged blade and a cast-on hilt; Birmingham *et al* 1964, p. 47
[92] Maryon 1949, p. 94
[93] Northover 1989, p. 112
[94] Tylecote 1987, p. 262

(such as carbon content) in order to improve the qualities of the finished product.[95] The actual process of welding is the same in every case, only the purpose for which it is employed is different, yet this distinction may help to gauge the degree of knowledge that ancient smiths had about the processes they were carrying out.

In examining early iron smithing in Europe, Tylecote asserted that welding is "implicit" in forging, so early smiths must have known how to weld pieces of iron together.[96] Structural welding is certainly an essential part of producing an iron ingot. Iron is smelted at ca. 1200º C, which is hot enough to melt the slag but still well below the melting point of iron, 1540º C.[97] Thus, when the smelted iron bloom was removed from the furnace, it would have typically resembled a sponge, in that it would have numerous cavities (where the silicates of the ore melted away from the iron), and would also contain some amount of slag and fuel, trapped in the matrix of metallic iron. In order to convert the bloom into an easily-transported ingot of more-or-less pure iron, the cavities would have to be welded shut – merely hammering them shut would not result in a solid iron ingot.[98] Furthermore, iron from multiple blooms could be welded together to form a single ingot.[99]

Structural welding was thus an essential part of producing an iron bloom, however it cannot be assumed that the producers or iron blooms shared their knowledge with the blacksmiths who created finished iron objects. Nevertheless, the practical realities of blacksmithing make it very improbable that a blacksmith would remain unaware of constructional welding. Indeed, the only way to avoid discovering it would be to carefully avoid ever heating ones work pieces beyond red heat. The higher the temperature of the work piece, the longer the smith could work it before having to return it to the fire. Therefore, it would be a natural tendency to heat up the iron as hot as possible before working it, and when the metal reaches white hot, it is suitable to be welded[100] (if it is heated any further, however, the carbon in the iron will begin to burn, indicated by sparks spitting off the metal). Nevertheless, examples of constructional welding are surprisingly lacking in the early 1st Millennium BC. One would expect the links of chains to be welded shut, for example, however examples from Khorsabad were simply clenched.[101] Sockets of spears were normally not closed, and one Achaemenid example which was closed was done so by brazing with copper rather than by forge welding.[102]

[95] Piaskowski 1991, p. 81
[96] Tylecote 1987, pp. 248-249
[97] Tylecote 1987, p. 248
[98] Moorey 1994, pp. 282-3
[99] Pleiner 1979, p. 90
[100] Coghlan 1956, p. 109
[101] Pleiner & Bjorkman 1974, p. 306
[102] Moorey 1994, p. 292

The case for technological welding is uncertain. A number of iron objects from the early 1st Millennium appear to have been made from various small pieces of iron piled up and welded together and then formed into the desired object. As Moorey observes, such laminated structures, mixing high-carbon and low-carbon iron, could have been deliberately made in order to ensure that an object too large to surface carburize would still have sufficient high-carbon iron throughout its fabric.[103]

Coghlan identified such in the fragments of an iron tripod from Khorsabad, which he suggested was built up of pieces of iron welded together (though the object was completely oxidized, so no metallurgical tests were possible). [104] A sample was able to be taken from the cutting edge of an iron hoe found at Khorsabad, however, which also shows the piling technique used for the tripod. [105] An iron pick from Lachish, found in a destruction layer dated to ca. 600 BC, also appears to have had its fabric formed by piling, though it has a low carbon content of 0.196%.[106] In addition, a spear head from Toprakkale also exhibits laminated layers of iron with varying carbon content. Piaskowski & Wartke found, in the sample cut from the spear head, two layers of iron separated from each other by another layer which had less carbon and phosphorus, though it did not have slag inclusions that often accompany the seams between the welded faces.[107] In all of these cases, however, the appearance of laminations could simply be the result of having used a heterogenous iron ingot as the raw material from which the objects were made (and thus would be examples of structural welding), as Piaskowski & Wartke suggest (see §6.2.2).[108] Indeed, the iron at the cutting edge of the Khorsabad hoe is *softer* than the iron from the interior of the tool, which is the opposite of what would be expected had the smith been deliberately trying to make a hard cutting edge.

The most convincing example of technological welding is a spear head from Deve Hüyük, which was built up of roughly 50 layers of iron which tend to run parallel to the blade.[109] They have an average carbon content of 0.18%, however where the faces of each of these plates joined the carbon content is much higher, 0.6%, indicating that the plates were forged in conditions which allowed surface carburization.[110] This layering of high and low carbon iron would have contributed to making the blade both flexible and resilient, and also capable of holding a sharp edge, much like the pattern welded blades of the Medieval Europe.[111] However, whether this was intentional or not is unclear.

[103] Moorey 1994, p. 248
[104] Coghlan 1956, pp. 137 & 180, pl. 1
[105] Pleiner 1979, p. 84
[106] Coghlan 1956, pp. 139-140 & 182-183, pl. 5
[107] Piaskowski & Wartke 1989, p. 108
[108] Piaskowski & Wartke 1989, p. 108
[109] Coghlan 1956, pp. 137-139 & 180-182, pls. 2-4
[110] Coghlan 1956, pp. 181-182
[111] Oakeshott 1996, p. 106

Technological welding, as defined by Piaskowski, implies a *deliberate* use of welding to manipulate the carbon content in an iron object. However, the above examples show that objects may be built up from heterogenous iron, and yet apparently not make effective use of varying carbon content. As Pleiner & Bjorkman observed, there is no evidence that smiths of the early 1st Millennium BC knew how to recognize or effectively use iron with varying carbon content.[112] Thus, perhaps a fourth form of welding should be added to Piaskowski's system: "billet welding," where a sufficiently large piece of iron to forge the final object is built up of smaller pieces, with no regard to their individual iron content.

Forge welding would likely be of limited utility for arrowhead manufacture. Arrowheads are small enough that they would, in most cases, not have to be built up out of smaller pieces of iron (scrap iron arrowheads, on the other hand, could indeed be welded together in order to be formed into a larger object). In addition, while a broken iron arrowhead could indeed be welded back together, the fact that they are both small and thin would prevent the pieces from being welded back into their original position. More likely, they would have to be stacked up, welded together into a billet and the whole arrowhead completely re-formed.

Hot forging required fairly basic tools. Presuming the smith could heat the iron to a sufficient temperature (presumably in a charcoal fire ventilated with tuyères), only a hammer and a flat, hard surface to serve as an anvil were necessary, though in many cases, tongs would also be essential for manipulating objects small enough to be heated in their entirety by the fire. While tools of this kind have rarely survived from the ancient Near East, an Egyptian plaque at the Ashmolean Museum appears to depict both hammer and tongs amongst a smith's equipment.[113]

Because of its versatility, the relatively small amount of tools required, and the ability to repair broken objects by welding them or re-shaping them, iron would have been an attractive material for military purposes, quite apart from its other advantageous qualities. A smith accompanying an army in the field would be able to maintain equipment and even make new equipment with relative ease.

6.3.3. Casting

Casting is the most effective method for forming bronze implements. The basic procedure involves melting bronze in a crucible and then pouring the molten bronze into a cavity shaped like the desired final object (the mold maker must also consider that the metal will shrink approximately 10% as it

[112] Pleiner & Bjorkman 1974, p. 307
[113] Curtis *et al* 1979, p. 377

solidifies[114]). The mold required for this process can take any one of a number of forms, which are enumerated below.

6.3.3.1. Sand casting

Perhaps the simplest form of casting, in terms of materials used, is sand casting. The most basic sand casting involved pressing a model of the object to be cast into slightly damp sand or earth, removing it, and then pouring molten metal into the cavity (leaving the upper face necessarily flat and unfinished).[115] Nevertheless, objects may also be cast in the round by means of sand casting, though it requires a more complicated molding procedure. Two part molds may also be made of sand, in which case the object to be molded is pressed halfway into the sand, then the whole is sprinkled with a fine, dry powder to serve as a release agent. Then more sand is packed on top. When complete, the mold should easily separate along the mold release layer, allowing the positive to be removed. A pour gate is added, and then the mold is then closed again and the metal poured in.

Evidence for sand casting in the ancient Near East is sparse,[116] though, since there is no mold to be preserved, this is no indication of the frequency with which this process was used. Even without a mold, sand casting may be detected by a texturing of the surface of a cast object caused by the sand. The relative size of the grains of sand used to cast the object would determine how coarse this texturing is (and how fine of detail is obtainable). However, if the object was polished or further worked after casting, even this indicator could be lost. Clay models of metal implements could also have been used as the positive for sand casting, but there is no way to be certain.[117] Fairly complex forms are attainable with sand casting, however since the mold is necessarily destroyed after every casting (in order to remove the casting), it is a comparatively labor-intensive process and therefore not particularly suitable for arrowheads, which need to be manufactured in some quantity.

6.3.3.2. Lost wax

The lost-wax casting technique was well-known in the ancient Near East. Its use is attested as early as the 4th Millennium BC.[118] Lost-wax casting involves creating a model of the object to be cast in wax (or another easily-carved substance that can be later melted out of a mold), attaching vents and pour gates where appropriate and then encasing in a molding medium. Afterwards, the entire mold is heated until the wax melts and runs out of the mold, leaving a cavity in the desired shape of the object. Molten bronze is then poured in and, once solidified, the molding medium is knocked away.

[114] Hulit 2002, p. 273
[115] Przeworski 1939, p. 111
[116] Moorey 1994, pp. 270-271
[117] Moorey 1994, p. 268
[118] Moorey 1994, p. 271

The final step, as with all forms of casting, is to remove the pour gates and vents from the completed piece and clean up any imperfections.

Arrowheads could certainly be made by this method. However, it would be necessary to do a wax carving for each individual arrowhead. This process could be considerably streamlined by employing a re-usable mold to cast the wax arrowhead positives. Indeed, it has been argued that the two bronze arrowhead molds from the Neo-Assyrian Period (see §6.3.3.4) served just such a purpose.[119] Nevertheless, lost-wax casting of arrowheads would be a relatively inefficient multi-step procedure, requiring additional materials (wax and casting medium) compared to casting directly into a re-usable mold.

6.3.3.3. Open mold

In order to save labor, re-usable molds were frequently employed. The simplest of these were open molds, which generally consisted of a single block of stone with a depression for the object to be cast carved into its upper surface. The molten metal would be poured directly into the cavity, which was perhaps first prepared with some sort of release agent.

Open molds would have been simple to make (compared to closed molds), and would have also had the advantage that any defects such as gas bubbles or oxides would rise to the surface where they could easily be scraped or filed off, helping to ensure that the molded surfaces of the object were free of defects.[120] Nevertheless, open molds would also waste a considerable amount of the cast metal, lost to oxidization due to the large surface area exposed to the air.[121] The flat back of the cast object also required a careful leveling of the mold; if not level, the metal would be too thick at one end and too thin at the opposite end. Closed molds do not require any precise leveling.

Open molds from the ancient Near East were often made to cast general shapes rather than the exact form of the object to be cast. One example from Tell Mishrifeh has three small depressions for casting small bronze "loafs" of consistent size and weight, presumably to be further worked by hand.[122] Tell edh-Dhiba'i has also produced several open moulds, one for narrow bars, another for a flat rectangular sheet.[123] Further examples are attested in Anatolia, however even in these cases the forms are vague enough to make identification difficult.[124] Nevertheless, some molds were intended to cast objects in their final forms (or close to their final forms). One mold from Tepe Gawra, for

[119] Blyth 1977, p. 38
[120] Tylecote 1986, p. 81
[121] Tylecote 1986, p. 84
[122] Luciani 2004, 160-161 & fig. 130
[123] Moorey 1994, p. 266, fig. 16
[124] Przeworski 1939, p. 111

example, has cavities for both generalized narrow bars as well as a well-defined double edged knife blade,[125] and a second mold has cavities for clearly-defined chisels.[126] Molds from Beycesultan also have depressions for simple bars as well as clearly-defined objects, sometimes on the same mold.[127]

Many molds for small objects, or "trinkets," from the ancient Near East indicate that some apparently open molds actually did have flat covers, making them rudimentary closed molds. The objects cast typically had one molded face, and the opposite face was flat. However, rather than simply being open and allowing the flat back face to be formed by the natural surface of the cast metal, these molds obviously had flat "lids," which closed the cavities. While the lids are often not preserved,[128] or perhaps not recorded with molds as their function may not always have been obvious to excavators, their existence is attested by the inclusion of pour gates in the mold blocks, as well as by holes for dowels meant to properly align the lid with the mold.[129] Indeed, it would be impossible to simply pour molten metal into the cavities of these molds, as it would flow out of the pour gate. Therefore, they were necessarily closed and stood on end in order to have the metal poured into them.

Flat, two-edged arrowheads with tangs could conceivably be cast in such open molds (with or without lids), however one face of the arrowhead (the upper in the mold) would necessarily be flat. Thus, the resultant arrowhead would be either asymmetrical (with a flattened triangular section) or have two flat faces, and consequently edges as thick as the core of the blade. In both cases, considerable work would have to be performed on each arrowhead after casting in order to make them serviceable, since in the former case, the asymmetrical arrowhead would not fly accurately, and in the latter, the thick edges would have to be filed down until they would be able to cut. There are no examples of such molds from the early 1st Millennium BC.

6.3.3.4. Closed mold

Closed molds, attested in the Near East at least as early as the 4th Millennium BC,[130] are those made up of two or more parts (two piece molds are commonly referred to as "bivalve"), which completely encase the cast object (except for the pour gate and vents). They are more complicated to manufacture, since the mold pieces must accurately align, and because the mold is closed, gas bubbles may remain in the piece and the mold may not be completely filled if the cast metal cools too quickly, resulting in an unsuccessful casting.

[125] Speiser 1935, pl. 47:b
[126] Speiser 1935, pl. 47:a
[127] Mellaart & Murray 1995, p. 174, fig. O.24:222; p. 175, fig. O.25:221; p. 179, fig. O.29:257
[128] One example from Alişar Hüyük is mentioned by Przeworski 1939, p. 112
[129] Canby 1965, p. 43
[130] Moorey 1994, p. 269

A comparatively simple two-piece mold would serve much better to cast a flat tanged arrowhead than an open mold. With the ability to form both faces of the arrowhead, it could be cast directly to its desired final form, with minimal work required after molding (principally, the removal of the metal plug formed by the pour gate, as well as any vents or flash that may be present).

The addition of a socket to the arrowhead necessitates an additional piece, a plug which will keep the socket area from being cast as a solid cone. Some of the earliest bivalve molds include plugs for socketed axes, adzes and hammers.[131] The addition of the socket plug substantially increases the complexity of the mold, since there is now an additional piece which must be aligned perpendicular to the others. Since it forms the bottom of the mold, the plug piece must also fit with very close tolerances to prevent any molten metal from leaking out, causing excessive flash or even a failed casting.

Trilobate arrowheads add an additional degree of complexity to mold making. With flat or bilobate arrowheads, there are two primary mold halves which mate with each other on a single plane. Trilobate arrowheads require a far greater degree of intricacy, since the cutting edge of each blade must lie along the join between pieces of the mold. Therefore, thee planes at 120 degree increments are necessary. In addition, as with the socketed bilobate molds, a fourth piece is also required as a plug for the socket.

The British Museum possesses two molds for socketed arrowheads from the early 1st Millennium Near East. The first (BM 116254A & B, see Plates 6-7) is the remnants of a four-part mold, found at Carchemish.[132] Three of the parts form segments of a cylinder, the interior of which is carved in a negative of a socketed trilobate arrowhead with a hook (Type 3a-3). Each segment also has a handle projecting some 9 cm from it. Two parts of the mold are missing: one of the side segments and the base (see Figure 6.6). The mold was recovered in a controlled excavation, providing reliable evidence for the manufacture of socketed bronze arrowheads at Carchemish in the early 1st Millennium BC.

[131] Moorey 1994, p. 269
[132] Woolley 1921, pl. 23

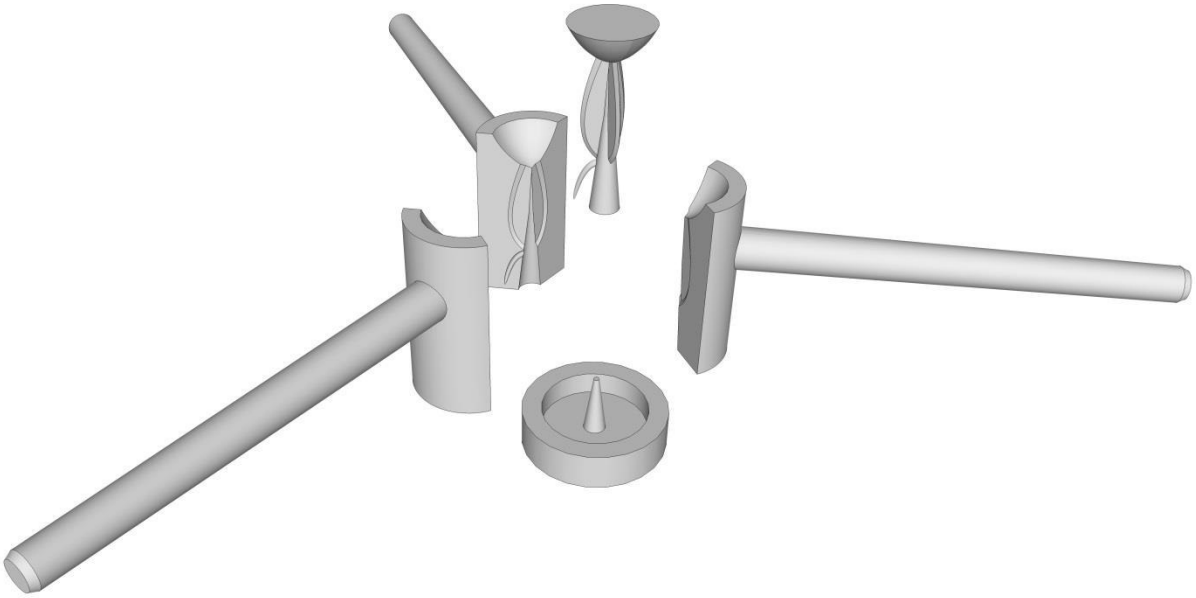

Figure 6.6: 3D reconstruction of the Carchemish mold as it would have appeared when complete, with a cast arrowhead. The three segments with handles (two of which survive) form the shape of the arrowhead and fit into the bottom piece, which includes a cone that prevents the socket from filling with bronze during casting. Note the casting still retains the plug from the pour gate, which would need to be removed before use.

The second mold (BM 124624, see Figure 6.7 and Plates 8-11) is far more impressive, a complicated affair made up of six pieces.[133] It was recovered intact, and is for casting two hooked trilobate arrowheads and one hooked bilobate arrowhead, all with sockets. The technical expertise evident in the creation of an object to such exact tolerances is quite impressive. Each of the three arrowheads could be cast individually, however, due to the close proximity of the pour gates for each, it was likely that all three were normally cast at the same time. This mold is reportedly from Nebi Yunus, however it was purchased from the antiquities market in the late 1800s, and therefore has no certain provenance (Derın & Muscarella, indeed, insist that any suggestion of provenance be completely disregarded[134]). Nevertheless, it seems likely that it is an authentic early 1st Millennium BC artifact – it was found long before the Carchemish example, and both show similarities in their construction. Furthermore, the Nebi Yunus mold is for types of arrowheads in common use during the latter part of the Neo-Assyrian Period. It is very unfortunate, however, that it does lack a reliable provenance, for if it were definitively from Nebi Yunus, it would strongly suggest local Assyrian production of socketed bronze arrowheads, particularly as the *ekal māšarti* of the city is precisely where one would expect such production to take place.

[133] see Coghlan 1952
[134] Derın & Muscarella 2001, p. 196

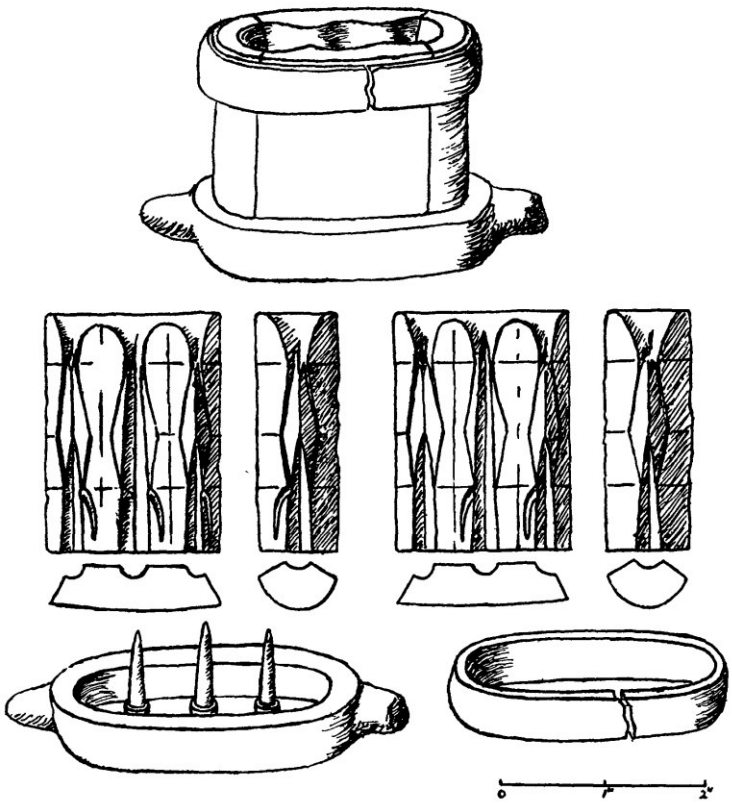

Figure 6.7: Bronze arrowhead mold, reportedly from Nebi Yunus (BM 124624); after Coghlan 1952, fig. 1.

Both the Carchemish and Nebi Yunus molds are made of bronze, which raises the issue of how the bronze arrowheads were cast. Casting metal into a mold of the same metal risks the casting fusing to the mold, destroying both. It has been suggested that the mold were used to cast wax positives,[135] which were then used to make lost-wax molds to pour the bronze into. However, it is possible to cast bronze directly into bronze molds if due caution is exercised, as experiments by Coghlan have demonstrated.[136] Indeed, the long handles attached to the segments of the Carchemish mold suggest that a substance more perilous than wax was being used, as the workmen would be able to keep their hands well clear should any molten bronze spill. Perhaps more importantly, the handles would also allow the mold to be handled even when the core of the mold was hot. If used for casting bronze directly, the mold would very likely be heated to a considerable temperature before use to help prevent the bronze from solidifying before it completely filled the narrow blades. The casting process itself would also heat up the mold. Therefore, the long handles of the Carchemish mold strongly suggest that it was used for direct casting. The Nebi Yunus mold is a much more ambiguous case, however, with only anomalous lugs on the base to give any indication of how it may have been handled.

[135] Blyth 1977, p. 38
[136] Coghlan 1952, p. 163-164

Coghlan asserted that bronze molds are quite unharmed by casting bronze objects in them,[137] however Tylecote suggests that they had a comparatively short useful life span (perhaps 50 casts), indicated by the comparative lack of duplicates of objects from metal molds (in European Bronze Age sites).[138] This observation is equally valid for the ancient Near East. Take, for example, the case of quadrilobates, which are attested only at Carchemish, and yet all surviving examples are unique. Tylecote's observation may have some merit, however it must also be considered that only a small fraction of objects originally cast survive in the archaeological record, so the rarity of preservation of multiple castings from the same mold should not be surprising.

In any event, the durability of the mold might have more to do with the skill of the caster. If sufficient parting agent (such as soot from a lamp) was used to prevent the molten bronze adhering to the mold, and if the casting is removed at the correct time (after the casting solidifies enough that de-molding will not distort it, yet still hot enough that it has not begun to significantly shrink and thus put pressure on the mold), a bronze mold should be able to be used more or less indefinitely,[139] as Coghlan's results suggest.[140]

6.3.4. Manipulating the hardness of metals

Work hardening and tempering are processes by which the characteristics of a metal object are optimized without changing the form of the object. Work hardening involves repeatedly hammering an area of an object, which compresses the metal, making it harder, yet more brittle.[141] On arrowheads and other weapons, this can be done to the edges of the blades to make them take a better edge. It does make that edge more prone to chipping, but the softer body of the blades helps to prevent more serious breaks such as would occur if the entire piece was work hardened. Work hardening of the edges of bronze objects is attested in the ancient Near East as early as the later 3rd Millennium BC.[142]

In its natural, annealed state, bronze is softer than iron. Pure copper can be work hardened to 110 VPN, but bronze with a tin content of 6% to 10% can be work hardened to 275-300 VPN.[143] While these upper limits of hardness may not have been attained in antiquity (due to impurities in the

[137] Coghlan 1952, p. 164
[138] Tylecote 1986, p. 92
[139] Burridge, Neil. Personal communication, February 22, 2010.
[140] Coghlan 1952, p. 164
[141] Moorey 1994, p. 249
[142] Moorey 1994, p. 269
[143] Moorey 1994, p. 238

metals), Late Bronze Age European bronze artifacts have an average hardness of 200 VPN, which indicates that a considerable degree of hardening was nevertheless possible.

Air-cooled iron is harder than air-cooled bronze, and while work-hardening the bronze can make it harder than iron, the iron can be work-hardened as well, producing a metal even harder than work-hardened bronze.[144] Iron can also be hardened by quenching it in water or oil. A number of objects from the early 1st Millennium BC from Egypt, Iran and Turkey exhibit characteristics consistent with quenching,[145] so it is likely that the technique was used during that period. Whether this quenching was intended to harden the object or merely cool it rapidly so it could be handled is less certain.

Hardness, in any event, is not the only important characteristic in a metal implement. Resilience is also very important. A very sharp blade is of little use if it breaks upon being used. Iron is more likely to bend rather than break compared to bronze,[146] which is a critical consideration for weapons. This resilience can increased still further by tempering the iron, though a carbon content of 0.25% to 0.89% is necessary for heat treating to be effective.[147] The basic process of tempering steel involves heating it to high temperature and then quenching it, rendering the metal very hard yet brittle. Then the metal is slowly heated up to a lower temperature which relieves the internal strains in the metal and leaves it both hard and flexible.[148] There is scant evidence of tempering of iron objects in the early 1st Millennium BC, possibly due to the aforementioned inability of smiths in that period to effectively control carbon content. An early 1st Millennium BC axe head from BC Egypt show evidence of tempering,[149] but whether it was deliberate is unclear, as is how widespread this technique may have been if it was deliberate.

6.3.5. Reasons behind the resurgence of bronze for arrowheads

In the earlier 20th Century - and even more recently[150] - it was generally assumed that the advent of ironworking represented a clear technological advancement, and that iron implements were inherently superior to bronze implements.[151] However, since the 1960s, metallurgical studies of iron and copper-alloy artifacts have demonstrated that, at least until ironworking technology had advanced to some extent, bronze was often the superior metal for many purposes.[152]

[144] Moorey 1994, p. 283
[145] Piaskowski 1991, p. 80
[146] Moorey 1994, p. 283
[147] Coghlan 1956, p. 174
[148] Coghlan 1956, p. 55
[149] Piaskowski 1991, p. 80
[150] Muhly *et al* 1985, p. 67
[151] Waldbaum 1999, p. 27
[152] Waldbaum 1999, p. 28

Bronze is the clear choice if one wishes to cast objects. However, claims that casting bronze enables one to easily mass-produce objects can easily be overstated.[153] All cast objects require some degree of individual work after casting. In the case of cast socketed bronze arrowheads, it would be necessary to remove the plug formed by the pour gate. The pour gate plug encompasses the tip of the arrowhead, so it could not be simply chiseled or broken off. Instead, it would have to be carefully cut or filed down and the tip of the arrowhead properly formed from its remnants. Thus the time required to complete a cast bronze arrowhead may in fact not be significantly faster than that required to forge an iron one; indeed, simple iron arrowheads, such as Type 5a-1, may have been faster to manufacture than socketed bronze arrowheads.

The ability to be forged is indeed one of the great advantages of iron. While a mold may be convenient for mass production – whether it saves time or not, it does help produce a consistent product – forging allows the smith to make any desired variations, and indeed, to make a wide variety of items with a simple set of tools, while casting them in bronze would require a new mold for each kind of item. Furthermore, forged iron can be welded together, enabling objects to be built up out of smaller pieces, and allowing damaged iron objects to be more effectively repaired. Iron can also, with sufficient carbon content, be hardened.

Cleuziou suggests that molding arrowheads in bronze was preferable for mobile mounted archers, based on the assumption that molding bronze arrowheads in small, easily-carried molds would be simpler and require fewer tools than forging iron ones, which he speculates would have been more likely to happen in towns.[154] However, casting bronze does not require significantly fewer tools or less raw material than forging. To cast a bronze arrowhead, one not only needs the mold, but the bronze, a crucible to melt the bronze in, and most importantly, a considerable quantity of charcoal for the fire. Furthermore, once the arrowhead is cast, files and likely hammers and chisels would be necessary to remove the pour gate plug and fashion the tip, as well as possibly a small anvil (such as a metal stake with a flat head, which could be driven into a log or perhaps the ground[155]) in order to work harden the cutting edges. Indeed, it is hard to imagine how a swift-moving mounted warrior would carry all this extra gear as well as a large quantity of charcoal in order to make arrowheads in the field while on campaign. It is much more probable that the arrowheads were made by specialists and that mounted warriors simply carried the arrowheads that they would need. Furthermore, a blacksmith could make arrowheads with fewer tools – all he would require is a small anvil, a hammer, and tongs to aid in handling the hot metal. The charcoal necessary to heat the metal would again be

[153] e.g. Rothenberg 1975, p. 80
[154] Cleuziou 1977, pp. 197-198
[155] for Roman examples, see Coghlan 1956, p. 120

the greatest burden, which suggests that any bronze work or iron work done on campaign was likely done by a specialist, and most likely done in a town or near a source of charcoal.

Iron was clearly considered, at least in some ways, superior to bronze or indicative of higher status in the early 1st Millennium BC. As early as the reign of Tiglath-Pileser I, who hunted bulls with iron arrows,[156] Assyrian inscriptions begin to specify that the weapons being used by the Assyrian king and his soldiers are iron. This trend seems to become particularly prevalent under Shalmaneser III,[157] who used iron armor on his horses,[158] whose troops used iron picks[159] and iron daggers.[160] Since iron seems to have been viewed as a higher status or higher quality material, a preference for iron likely contained a social element rather than merely technical considerations.

It is also noteworthy that iron was more expensive that bronze until the Neo-Babylonian Period,[161] so material costs were not likely a major factor driving materials choices. Iron began to be employed for arrowheads while it was still more expensive than bronze, and shortly after bronze was again used for arrowheads on a large scale, its price rose above that of iron. Arguments have been made that the resurgence in the use of bronze for arrowheads was driven by a scarcity of iron.[162] However, there does not appear to be any evidence for any such scarcity of iron, and throughout this period, other weapons and tools were being made of iron.[163]

The reason for the resurgence of bronze for arrowheads was actually most likely due to the new form of arrowheads being used. Bronze was primarily employed for socketed arrowheads, while tanged arrowheads were most often iron. Sockets could be forged from iron, as they often were for spear heads.[164] However the small sockets of arrowheads would be much more challenging to forge than the large sockets of spears and were thus much more easily cast.

6.4. Factors in arrowhead design

6.4.1. Weight (range versus power)

The design of an arrowhead is an exercise in compromises, and perhaps the most critical of these compromises is the weight of the arrowhead. In principle, the lighter an arrowhead is, the farther it can be shot since there is less mass for the bow to accelerate. However, there is also less mass

[156] Grayson 1991, p. 25 (A.0.87.1, 66)
[157] Pleiner & Bjorkman 1974, p. 287
[158] Grayson 1996, p. 86 (A.0.102.17, 22)
[159] Grayson 1996, p. 86 (A.0.102.17, 33)
[160] Pleiner & Bjorkman 1974, p. 287
[161] Moorey 1994, p. 290
[162] e.g. Snodgrass 1964, p. 154
[163] Rothenberg 1975, p. 80
[164] e.g., the iron spear heads from Nimrud, all of which are socketed; Curtis 2013, pp. 38-39, pls. 9-10

impacting the target, which causes proportionately less damage. If a target required more impact energy to penetrate – an individual wearing armor, for example – a heavier arrowhead would be necessary, though it would have to be fired from a shorter range. Archers in the ancient Near East were certainly well aware of this balance, and texts from Mari indicate that archers preferred to have a variety of weights of arrows at hand.[165] And indeed, a quiver full of arrows found at Karmir Blur contained arrowheads in at least two different sizes.[166]

During attacks on cities, the defenders would have an automatic advantage. Firing from atop the city walls, their range would be extended significantly beyond that of the attackers. The attackers would therefore need to approach through a region where the defenders could fire upon them, but they could not yet reply in kind (which no doubt was one of the principle reasons for the development of the head-high siege shields so often depicted on Assyrian reliefs, see §4.2.4).

Weight was not the only factor influencing range, however. Large arrowheads cause more aerodynamic drag and their larger surface area is more susceptible to windage, and to correct this, larger fletching – which causes yet more drag – is needed to keep the arrow flying straight.[167] Thus for long range shooting, light, compact arrowheads like the socketed bronze bilobates and trilobates were ideal in both terms of weight and aerodynamics.

6.4.2. Cutting versus puncturing

Another trade-off in arrowhead design is the ability of the arrowhead to puncture its target and its ability to open a wide wound that will cause a great deal of bleeding. The smaller the section of an arrow, the more easily it can penetrate the target. There is a practical limit on how thin an arrowhead can be made, of course, as if it is too thin, it will simply break or bend under the force of the impact. In fact, in the medieval Near East, experienced archers would often snap off the very tip of their arrowheads in order to help prevent breakage on impact.[168]

The most difficult targets to pierce were armored soldiers, and so bodkin-type arrowheads were developed specifically for use against them.[169] As an arrow pierces armor, it must perform two tasks. First, it must punch a hole in the metal, and then as the arrowhead continues to penetrate, bend back the fragmented shreds of metal left from the initial penetration.[170] The wider an arrowhead is, the

[165] Miller *et al* 1986, p. 189
[166] Piotrovsky 1970, unnumbered plate at the end of the Russian section
[167] Blythe 1977, p. 32
[168] Latham & Paterson 1970, pp. 26 & 31
[169] This function of bodkins was noted by several authors; see for example Rothenberg 1975, p. 79-80 and Petrie 1928, p. 16
[170] Stretton 2006b, pp. 136-137

more metal is has to tear and bend out of the way to allow it continue penetration. Bodkins concentrate the most mass in the smallest possible area, so that relatively little metal must be displaced, allowing the arrow to expend more of its energy on penetrating the target and increasing the chances of inflicting an incapacitating wound. In late medieval Europe, where the use of steel plate body armor had become reasonably frequent, bodkins had become the standard military arrowhead as they were the arrowhead form best suited to penetrating armor.[171]

However, the wound produced by a bodkin point would be small and cause relatively little bleeding compared to a broader form of arrowhead. For "softer" targets, a broad blade could be used, allowing the creation of wider wounds. These wider arrowheads are generally termed "broadheads," however due to the imprecise nature of the term I have avoided using it in this work. Certain forms of arrowheads in the ancient Near East were certainly developed to maximize the size of the wound they produced. For example, the very wide swallowtail was almost certainly used against "soft" targets, presumably mostly for hunting (as were its medieval European analogues[172]). Swallowtails would not have been very effective against armored soldiers, however, since they would have to dissipate much more of their impact energy in cutting open a considerably larger area of armor.

Extra blades could also be added to an arrowhead to increase bleeding, rather than simply making the blade wider. Trilobates often had quite small blades, but the presence of a third blade created a wound that was fairly large for the size of the arrowhead. In addition, that wound would be an irregular Y-shape, which would likely be more difficult to treat and stop from bleeding than a linear wound caused by a leaf-shaped arrowhead.[173]

6.4.3. Socket versus tang

Prior to the 1st Millennium BC, the tang was the standard method for affixing arrowheads to arrow shafts. There were several exceptions to this rule that should be noted. A number of unusual round bodkins with barbs, quite reminiscent of harpoons, were found in the mid-3rd Millennium BC Royal Tombs of Ur.[174] Several of these had sockets (some of which were cast while others were hammered into shape), though others had tangs. Woolley classified them as arrowheads, but some of them (particularly U.17619) appear too large for arrows and are more likely to have been the points of thrown weapons such as javelins, or they may have indeed been harpoons. Two other socketed points were found at Boğazköy,[175] both of which have barbed heads and long forged sockets, which is to say they were created by hammering out a triangle of metal and then curling it into a cone. One example,

[171] Stretton 2006a, p. 114
[172] See Type H4 in Jessop 1996, p. 194
[173] Modern hunting arrows also normally have three or four blades in order to maximize bleeding.
[174] Woolley 1934, p. 304, pl. 227, nos. U.9342, U.8586, U.8236, and U.17043
[175] Boehmer 1972, p. 109 & pl. 30

884, dates to the Late Bronze Age (Büyükkale III),[176] but the other (884A) was not datable, though its similarity to 884 suggests that they are related. These artifacts were listed as arrowheads by Boehmer most likely because of their size, which is comparable to larger arrowheads. Their form, however, clearly imitates that of spear heads, and they may have been intended as models of spear heads (perhaps belonging to a somewhat smaller than life-sized statue), or they may have been intended for javelins. The Ur and Boğazköy socketed points represent sporadic experimentation with arrowhead form (if they were, in fact, arrowheads). Tangs remained the near-universal method for affixing arrowheads to arrow shafts until well into the 1st Millennium BC.

It should also be noted that sockets were commonly used to attach spear heads to shafts for two reasons. First, it is easier to make a large socket than a small one. This is particularly the case with iron, where forming the socket requires hammering out a flat fan-shaped section where the tang would be and then carefully rolling it into a cone. Second, arrowheads are designed for head-on impact, so all of the impact energy passes, in theory, directly from the arrowhead to the arrow shaft along the central axis of the arrow. However spears, being hand-held melee weapons, would be much more likely to experience significant lateral forces. Even though spears were usually not designed for slashing at opponents, in hand-to-hand combat, it would doubtless be very common for spears to not strike their target directly, or to be struck by opponents who are trying to knock thrusts out of the way. Therefore, the joint between a spear head and a spear shaft must be considerably more robust. A tang requires the spear shaft to be weakened by creating a cavity for it to be inserted into, and if the blade was subjected to strong sideways forces, the tang would act as a lever within the spear shaft and perhaps cause it to crack. A socket would allow for a stronger, solid shaft, and the leverage of sideways forces on the blade would be distributed over a wider area.

Several factors contributed to the popularity of tangs, and their continued use well into the Middle Ages.[177] First, the standard material for arrow shafts in the ancient Near East was reed, and since reeds naturally had hollow centers, it would have been very easy to insert a tang into them (provided that no wood foreshaft was used). Wooden arrowheads required a hole to be drilled for the tang, or a slot cut in the end of the shaft. Secondly, tangs were relatively easy to make. When forged, the smith would merely have to draw some of the metal out into a rod, and if the smith began with a rod, a length of it could simply be left attached to the blade to serve as the tang. Cast tanged arrowheads were also relatively simple, requiring only a basic two-part mold.

However, tangs did have a disadvantage. Upon impact, the momentum of the arrow shaft would force it down on the arrowhead. The tang inserted into the shaft would tend to act as a wedge, causing the

[176] Genz 2004, p. 9
[177] see Jessop 1996, p. 195

arrow shaft to crack or split as it rode up on the arrowhead. The destruction of the arrow shaft in itself would not necessarily be viewed as negative – the archer would not be able to re-use it, but neither would those he fired it at be able to pick it up and fire it back. However, a considerable portion of the impact energy of the arrow would be expended in cracking the shaft, minimizing the effectiveness of the arrow. This disadvantage could be minimized by including a stop on the tang, which provided a reasonably flat surface for the end of the arrow shaft to rest against, though this added to the complexity of the arrowhead. Another solution was to add a foreshaft of some kind of hard wood to the forward part of the arrow shaft, and attach the arrowhead to that.[178] While this reduced the possibility of the shaft splitting, it did add to the complexity of manufacturing the arrows.

The early 1st Millennium BC witnessed a significant development in arrowheads in the Near East, namely the first wide-spread usage of sockets for attaching the head to the shaft. Sockets largely resolved the principle drawback of tangs – given that sockets surround the end of the arrow shaft, they tend to help hold it intact on impact, rather than cause it to split. The superiority of sockets is illustrated by the fact that they were used universally for arrowheads in later medieval Europe.[179]

Sockets, however, also had a significant disadvantage: they were considerably more difficult to manufacture. Sockets were commonly forged on spear heads, however the larger size of the spear head made forging their sockets comparatively easy. Forged socketed arrowheads were extremely rare, with only one example from Toprakkale[180] and several from Hasanlu,[181] otherwise forged arrowheads, both bronze and iron, invariably have tangs. Socketed arrowheads could be fairly easily cast in bronze, however they required a significantly more complex mold than a tanged arrowhead would (see §6.3.3.4). A tanged 2-bladed arrowhead requires only a simple 2-piece mold, where each half has a cavity for one half of the arrowhead. A socketed arrowhead requires at least three – two halves plus a plug to keep the socket from being filled with bronze. The two extant molds are for trilobate arrowheads and exhibit considerable complexity and sophistication in manufacture, and would certainly have required a highly skilled craftsman (see §5.3.3.4).

6.4.4. Barbs and hooks

Barbs and hooks both serve the same purpose – they prevent the arrow from being easily removed from the wound. An attempt to withdraw the arrow would cause the point of the hook or barbs to catch in the flesh, increasing tissue damage and bleeding.

[178] Blythe 1977, p. 47
[179] Jessop 1996, p. 193-195
[180] found at Toprakkale; see Wartke 1990, p. 128
[181] Thornton & Pigott 2011, p. 143, fig. 6.4

Barbs are created by cutting the rear part of the blade back up towards the point and inward until it meets the core of the arrowhead. The result is a sharp point on the back end of each blade. Barbs are used on flat leaf-shaped arrowheads as well as socketed bronze arrowheads (though, in the latter case, very rarely compared to hooks).

Hooks were only used on socketed bronze arrowheads, likely because they can easily be added to the molds. The hook was always added directly behind one of the blades by the simple expedient of carving a cavity for it into the mold on both of the faces that form the blade above it. Furthermore, locating the hook behind a blade would have had the additional benefit of ensuring that it would enter a wound already caused by the blade above it, so the hook would not cause additional resistance to penetration.

Andrae suggested that hooked arrowheads were employed for fire arrows.[182] Presumably the hook would have in some way been employed to affix the flammable material to the arrow. This is not a very satisfactory theory for several reasons. First, while earlier Mesopotamian representations depict fire arrows in use,[183] Neo-Assyrian reliefs never show them, although they sometimes show torches being thrown to set enemy cities on fire (e.g. Sennacherib's assault on Lachish; see Figure 8.7). Two royal inscriptions, one of Assurnasirpal II[184] and one of Shalmaneser III,[185] do mention "raining flaming arrows" upon their enemies, but in that context, it could merely be poetic language rather than a reference to actual fire arrows being employed. All of this suggests that fire arrows were not in common use in the early 1st Millennium BC, while socketed bronze arrowheads with hooks were extremely common. Furthermore, it is difficult to see how a backwards-pointing hook could help hold flammable material to an arrowhead in flight. It would be a more convincing argument if the hooks pointed forwards, which would help hold the burning material in place during the great acceleration the arrow would experience during firing. Andrae indeed suggested the possibility that the hooks originally pointed forwards but were bent back during impact,[186] however he notes that if this were the case, it is curious that no arrowheads were found with their original configuration, and one would presume that the hooks would be prone to break off rather than bend to such a degree. The question is made moot by the two surviving early 1st Millennium BC molds for hooked arrowheads (see §6.3.3.4): in both cases, the molds are designed with the hooks pointing emphatically backwards.

[182] Andrae 1913, p. 143
[183] For an Early Dynastic example, see Miller *et al* 1986, p. 183, fig. 3.
[184] Grayson 1991, p. 225 (A.0.101.2, 21b-23a)
[185] Grayson 2002, p. 21 (A.0.102.2, 66b-75a); CAD, Vol. M, Part II, p. 191 (*mulmullu*)
[186] Andrae 1913, p. 143

6.5. Arrowheads versus other projectile points

One of the greatest challenges in dealing with ancient arrowheads is differentiating them from the points of thrown weapons, such as darts or javelins. Thrown weapons are poorly attested in the Neo-Assyrian Period. There is some evidence that thrown weapons were used in Assyria. The L^4 inscription of Assurbanipal includes, among a list of the king's purported superlative abilities, the statement *ašallu kīma šiltaḫi azmaranē nurruṭūti*, which is translated "I can throw unwieldy lances as if they were darts" in the *Chicago Assyrian Dictionary*[187] and "I threw quivering lances as if they were darts" by Zamazalová.[188] The word *šiltaḫu*, however, is used in contexts where it unambiguously means "arrow,"[189] and there is no evidence to suggest that it was also used for thrown weapons. Thus, a more accurate translation would be 'I threw quivering spears as if they were arrows," though this still does not make clear whether throwing a spear *like an arrow* was the remarkable feat in question, or whether it was simply throwing a spear *at all*. If the former, it implies that thrown weapons were not uncommon in Assyrian usage, if the latter, it implies that thrown weapons were uncommon. The term for "spear" or "lance" - *azmarû* – certainly refers to hand-held spears, as it is labeled as such in a depiction of Assurbanipal stabbing a lion with a spear.[190] The term could have had a more general usage and have been used to refer to similar thrown weapons, however there is no clear evidence for this. In sum, while javelins or thrown spears may have been used by the Assyrian military, they appear to have been very uncommon.

Thrown weapons are rarely depicted in reliefs, with one scene from Khorsabad showing foreigners carrying pairs of short spears (see Figure 6.8).[191] While this depiction cannot be conclusive, it is certainly conceivable that these weapons were javelins due to their length and their multiplicity. Javelins were used by the Greeks in the 7th Century BC,[192] though if they were employed by the Assyrians, it does not appear to have been a common practice. Darts are not clearly depicted on any relief, and may not have been in use during the Neo-Assyrian Period.

Unfortunately, a clear distinction between arrow heads and the points of thrown weapons cannot be made among the archaeological material. There is no clear typological distinction, and thrown weapons certainly at least sometimes used points that were essentially identical to arrows.[193] This should scarcely be a surprise, as a thrown weapon would be subject to the same kind of forces that an arrowhead would. While a distinction between arrowheads and spear heads can most likely be made

[187] CAD, Vol. A, Part II, p. 528 (*azmarû*)
[188] Zamazalová 2011, p. 316
[189] CAD, Vol. Š, Part II, p. 448-451 (*šiltaḫu*)
[190] CAD, Vol. A, Part II, p. 527-528 (*azmarû*)
[191] Albenda 1986, pls. 29 & 30
[192] Snodgrass 1964, pp. 136-139
[193] Miller *et al* 1986, p. 189

securely on the basis of size, thrown weapons can employ points weighing as little as larger arrowheads to as much as small spear heads, giving a constant continuum of point sizes.

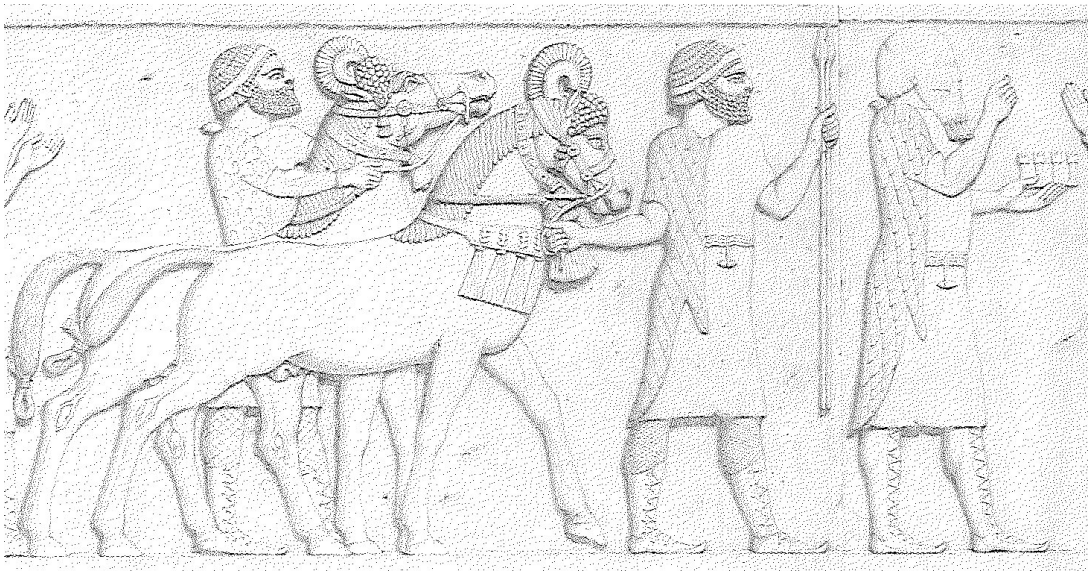

Figure 6.8: A foreigner carrying what appear to be two javelins, from the reliefs of Sargon II at Khorsabad; after Albenda 1986, pl. 30.

Cross & Milik proposed that points with blades of over 6 cm should be classified as javelin heads, and those with blades of under 6 cm as arrowheads or dart points.[194] They observed that points of over 6 cm tend to have considerably thicker and heavier blades, and therefore were more likely intended for the heavier work of a javelin. However, even if this system may be tenable, it was based only on a single site. Thornton & Pigott defined arrowheads from Hasanlu as points with blades of 8-9 cm or less and a solid tang or a socket of less than 1 cm in diameter (to distinghish them from small socketed spear heads).[195]

Weight could also be used as means to differentiate arrowheads from other projectile points. Rothenberg suggested that, based on studies of ballistics and practical experiments, roughly 7 grams was the maximum optimal weight of ancient arrowheads, and even very heavy arrowheads were not likely to weigh more than 10 grams, so anything heavier was likely to be a javelin point.[196] However, textual sources belie this conclusion. One text from Mari records the king ordering fifty arrowheads of 40 grams each, another fifty of 24 grams each, one hundred 16 gram arrowheads and two hundred 8 gram arrowheads.[197] Even the mass of small 8 gram arrowheads, no doubt intended for long-range volley fire or area saturation due to their large numbers, outweigh Rothenberg's maximum ideal

[194] Cross & Milik 1956, p. 19
[195] Thornton & Pigott 2011, p. 138
[196] Rothenberg 1975, p. 78-79
[197] Miller *et al* 1986, p. 189

weight, and the largest arrowheads could doubtless be easily mistaken for javelin points. The lengths of the arrowheads from Nimrud (excluding those with broken tips, a total of 159 examples) range from 1.5 grams to 24 grams, with the bulk between 1.5 to 5 grams (see Figure 6.9). The unbroken arrowheads from Lachish that have weights provided range from 1.0 to 22.1 grams, but more than half weigh between 5 to 10 grams They are heavier on average than the Nimrud arrowheads, yet still on the light side compared to those listed in the Mari text. This suggests that long range massed archery, where light arrowheads would be desirable, was very commonly used in warfare. It should also be noted that the data presented are the weights of the arrowheads in their current preserved state, and given that oxidized iron is some 30% lighter than solid iron[198] and virtually all the arrowheads were very badly corroded, their original weights would have been somewhat greater.

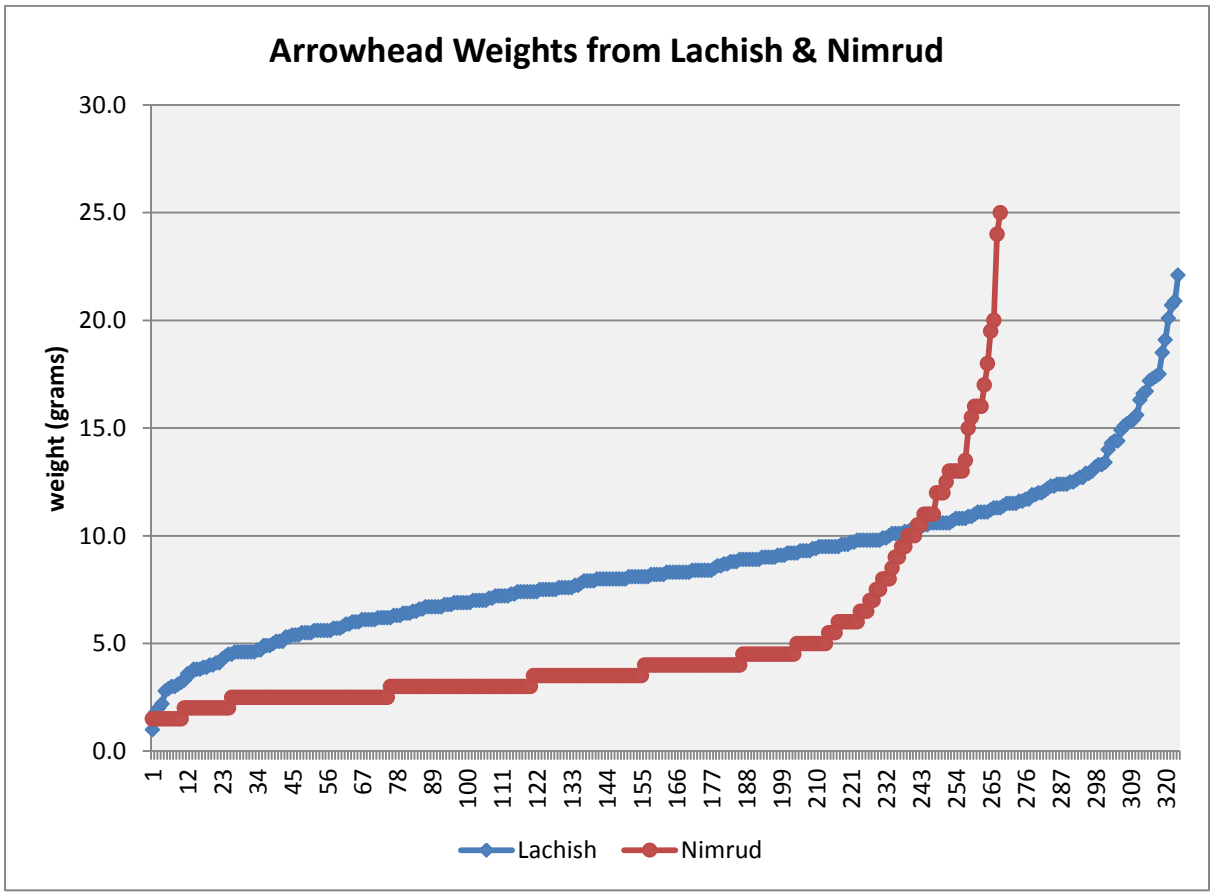

Figure 6.9: Weights of unbroken arrowheads from Lachish and Nimrud.

The width of the tang might give some indication of the function of a point – presumably, javelins would have had thicker shafts than arrows, and so points with unusually thick shafts might have served as such. However smaller thrown weapons, such as darts, likely had shafts of comparable width to arrows.

[198] Rothenberg 1975, p. 74

Therefore, since distinctions based on weight or form cannot be made with anything approaching certainty, I have included all objects which might reasonably be arrowheads in this work.

6.6. Conclusions

Thus, both iron and bronze continued to be used for arrowhead manufacture through the Neo-Assyrian Period since both had their advantages for certain purposes. On the whole, iron replaced bronze as the material of choice despite iron being the more costly material at the time. Furthermore, it does not appear that smiths of the Neo-Assyrian Period were able to effectively manipulate the carbon content of their iron objects, so they were not able take advantage of the ability of sufficiently carburized iron to be heat treated. Nevertheless, iron did have some advantages that Neo-Assyrian smiths most likely were able to exploit. Iron could be welded (and thus broken objects could more easily be repaired) and it could be forged, allowing the smith to easily make variations on the design without having to create an entirely new mold. The preference for iron may have been based partly on cultural factors, however, since inscriptions suggest that iron was viewed as superior or preferable to bronze for weapons. In any event, bronze made a major resurgence when socketed arrowheads were introduced in the 7th Century BC because the small sockets of arrowheads were far easier to cast in bronze than to forge in iron.

7. Arrowheads and Ethnicity

Ethnicity may best be defined as a socially or culturally constructed group identity and the cultural expressions that maintain group cohesion and differentiate one group from other groups.[1] Forms of artifacts and their manner of decoration may be expressions of the identity of a specific ethnic group, and therefore the distribution of such artifacts may be taken to reflect, to some degree, the movements of the ethnic group. However, studies of artifact styles and their relation to ethic groups has suggested that the relationship between artifact and ethnicity is far from straightforward, and that attempts to use material culture to draw inferences about ethnic groups may be misleading.

There has been a great deal of debate over whether arrowheads, in particular, can be used as ethnic indicators, so that the distribution of types of arrowheads can be associated with the spread of the specific groups of people associated with those arrowheads. This debate primarily focuses on the socketed bronze arrowheads, both bilobate and trilobate, which are often associated with the Cimmerians and Scythians.

7.1. Ethnic attributions in textual sources

Archery equipment was sometimes given an ethic identifier in cuneiform sources form the early 1st Millennium BC. These must be approached with some caution, since the precise meaning of the ethnic designations employed changed over time. In Neo-Babylonian and Achaemenid texts, the term 'Cimmerian' (*Gimirāia*) is used as a general term to refer to not only the Cimmerians but also the Scythians and Sakas (as Achaemenid multi-lingual inscriptions prove), all of whom appear to have been culturally closely related.[2] In the Neo-Assyrian Period, however, the terms Cimmerian (*Gimirāia*) and Scythian (*Iškuzāia*) did appear to refer to specific groups,[3] as they are sometimes both used to refer to two distinct groups of people in the same text (such as the Annals of Esarhaddon).[4]

Bows were sometimes referred to by a national or ethnic identifier which either denoted a particular form of bow associated with the group in question, or perhaps those who manufactured the bows. The Epic of Sargon II mentions an Elamite bow (GIŠ.BAN NIM.MA-*ti*),[5] while later Neo-Babylonian texts mention both Akkadian[6] and Cimmerian[7] bows (bearing in mind that at this time, "Cimmerian" was apparently a general term for all such related nomadic groups).

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[1] Loosely based on the definition provided by van Driel 2005, pp. 1-2.
[2] Ivantchik 1997, p. 14
[3] Ivantchik 1997, p. 15
[4] Ivantchik 1997, pp. 16-17
[5] SAA III 18, r10
[6] Salonen 1965, p. 42; TCL 12, nr. 114, 1-2 & *AnOr* 8 35: 25
[7] Dougherty 1920 (YOS 6), nr. 237, 3: *1 GIŠ.BAN gi-mir-ru-i-ti* & Pohl 1933 (AnOr8), nr. 35, 25: *60 GIŠ.BAN.ME gi-mir-ru'*; also see Zutterman 2003, p. 126 & CAD, Vol, G, p. 75 (*gimirraja*)

Arrows are also sometimes given ethic identifiers. A Neo-Babylonian contract, for example, mentions guards armed with Cimmerian arrows (and, oddly enough, Akkadian bows).[8] YOS 6, 237 lists 200 Cimmerian reed arrows (180 of which had copper heads).[9] A further text mentions Babylonian soldiers using Scythian arrows with both bronze and iron points.[10] This text is of particular interest for its mention of iron "Scythian" arrows. If we presume that by "iron Scythian" arrowheads, what was meant was socketed trilobate or bilobates made of iron, it is worth noting that iron arrowheads with sockets are extremely rare in the early 1st Millennium BC, with several examples from Hasanlu and one from Toprakkale. While the rarity of socketed iron arrowheads does not necessarily rule out the form of arrowhead as being the feature that defines the arrow, it does raise the possibility that what distinguished "Scythian" from "Akkadian" arrows was not the arrowhead but rather some other feature, such as perhaps length. If a "Scythian bow" was indeed a compact composite bow with a short draw, it would require a shorter arrow than a bow with a longer draw. However, the aforementioned text where guards are armed with Akkadian bows and Cimmerian arrows suggests that length, at least, may not have been the definitive attribute, since if it was, the Cimmerian arrows would be too short to allow the Akkadian bow to be fully drawn.

One frequently cited example of 'Cimmerian' arrows is problematic. In his translation of an Achaemenid text, Ebeling proposed the reading, "1 me 20 *ši-il-ta-ah šu-uš-ku-bu* 10 *ši-il-ta-ah gi-ir-ri*" as "*120 Pfeilen, auflegbar, 10 Pfeilen, gimirräische (?)"*[11] Ebeling himself indicated some uncertainty about reading *girri* as "Cimmerian," though it is still difficult to see how he came to that reading when the word *girru* (which can mean "military campaign") seems to fit just as well, if not better. The *Chicago Assyrian Dictionary* proposes the reading "120 mounted(?) arrows, ten unmounted(?) arrows for (military) equipment,"[12] which seems to fit the text rather better though the word "unmounted" is not in the Akkadian at all, but inserted based on the assumption that because two different kinds of arrows are being listed, they must be in some manner logical opposites of each other. A more literal translation might be, "120 mounted arrows, ten campaign arrows," though that leaves the term "campaign arrows" open for interpretation.

Precisely what is signified by ethnic identifiers for archery equipment is difficult to define. It could refer to the manufacturers of the items, or to the source from which they were received. However, it is perhaps more probable that they referred to the style of an item, its physical form and/or the materials it was made of.

[8] Dandamaev & Lukonin 1989, p. 226; *TCL* XII, 114
[9] Dandamaev & Lukonin 1989, p. 226; *YOS* 6, 237
[10] Dandamaev & Lukonin 1989, p. 226
[11] Ebeling 1950, pp. 209-210
[12] CAD, Vol. Š, Part III, 1992, p. 349 (*šurkubu*)

While ethnic identifiers for the style of an object may have some relative significance in helping to distinguish between two or more different types of item, they do not have an absolute significance in that these objects cannot be said to actually, in some fundamental way, belong to the ethnic group mentioned. After all, while blue jeans may be considered 'American' in terms of style and even origin, it hardly means that all blue jeans are made by Americans, still less that all people wearing blue jeans are Americans. As Roaf observed, there are certainly cases where different ethnic groups, sometimes over a very wide area, would adopt (perhaps of their own choice or perhaps under the compulsion of a dominant group) a certain material culture, such as the Late Uruk material culture which is attested over much of ancient Mesopotamia.[13]

One important point that these texts do make clear is that non-Cimmerians made use of 'Cimmerian' style equipment. Archaeological finds – such as the socketed bronze arrowheads found together with iron leaf-shaped arrowheads in a store room at Karmir-Blur[14] and the local manufacture of other Cimmerian-style objects there[15] - provide additional evidence of this adoption of styles by other peoples. This both clearly proves that the ethnic designations for objects simply refer to a style associated with that group, and also illustrates that archaeological finds must be interpreted with caution, and simply finding an object of a style associated with a certain ethnic group does not necessarily mean that a representative of that ethic group was present, or even that it was made by members of that ethnic group at all.

7.2. Ethnic attributions of material culture

As early as the late 19th Century, socketed bronze arrowheads were being associated with the Scythians.[16] Schmidt claimed that socketed bronze arrowheads originated in southeast Europe among the Scythians, and since they were then borrowed and extensively used by the Greeks, he labeled them "Greco-Scythian."[17]

Petrie believed that the socketed bronze arrowheads found in Egypt were probably Scythian, from the purported Scythian invasion in the late 7th century,[18] and while he did not specifically refer to the socketed bronze arrowheads found at Gerar as "Scythian," Petrie clearly associated them with Central Asia.[19] Likewise, Ghirshman stated that the socketed bronze arrowheads from Cemetery B at Sialk were characteristic of the Iron Age Russian Steppe, without giving them a specific ethnic label

[13] Roaf 2005, p. 313
[14] Dandamaev & Lukonin 1989, p. 226
[15] Ivantchik 1997, p. 34
[16] Schmidt, H. 1908, p. 183
[17] Schmidt, H. 1908, pp. 183-186
[18] Petrie 1917, p. 34
[19] Petrie 1928, p. 15

(though mentioning that they are often called "Greco-Scythian").[20] Lloyd remarked that the trilobates found at Sultantepe, "appear to be Scythian,"[21] One dissenting view was Woolley, who implied that at least some socketed bronze arrowheads were "Hittite," since the discovery of a mold for socketed trilobate arrowheads was found at Carchemish (see §6.3.3.4), which suggested to him that the inhabitants of that city were making such arrowheads.[22] Studies linking socketed bronze arrowheads found in the Near East with the Scythians or related groups (often with the proviso that not *all* such arrowheads were actually produced by those peoples) continued through the latter half of the 20th Century.[23]

Sulimirski published the first major, comprehensive study of socketed bronze arrowheads and their relation to the Scythians (in the broader sense of the term – as Sulimirski himself acknowledged, the term "Scythians" was used to refer to a number of distinct, if culturally related, tribes[24]). Sulimirski, however, relied heavily on Classical sources, most of which are significantly later in date (such as Herodotus), and the few that can be considered possibly contemporary (such as Homer and Hesiod[25]) are of uncertain date. He also takes it as a given that the "Scythian" style of artifacts are inherently the direct product of the peoples referred to as "Scythians" in these various texts. Because of the presumed dating of Hesiod and Homer, both of whom mention Scythians, Sulimirski assumed that Scythians must have been in the Near East in the 9th or 10th Century BC, well before any Scythian-style artifacts appeared.[26] This, in turn, led him to conclude that the Scythians possessed a different material culture when they entered the Near East, and it was their close contact with the inhabitants of the Near East that caused them to then develop the "Scythian" style of art and artifacts which would then spread back to the Scythian lands in the Russian steppe.[27] He therefore attempted to link the Cimmerians and early Scythians with "pre-Scythian" Eurasian archaeological cultures. He assigned the Srubnaia archaeological culture to the early Scythians, even though it required him to change the dating of this culture to fit his theory, as it would otherwise have been too early.[28] Sulimirski was also inclined to associate the Cimmerians with the Catacomb Culture, which the Srubnaia Culture

[20] Ghirshman 1939, p. 46
[21] Lloyd 1954, p. 107; according to Lloyd, these were iron, though two of them, numbers 4 & 5 in fig. 6 are of such a classical shape for socketed bronze trilobates that one wonders if they were not actually corroded bronze, mistaken for corroded iron.
[22] Woolley 1921, p. 125
[23] e.g. Sulimirski 1954, p. 313; Boehmer 1972, p. 115; Medvedskaya 1982, p. 88; and Yamauchi 1983, p. 94
[24] Sulimirski 1954, p. 283
[25] Sulimirski 1954, p. 284
[26] Sulimirski 1954, p. 284
[27] Sulimirski 1954, p. 286
[28] Sulimirski 1954, p. 287

replaced.[29] More recent studies maintain dates for these periods that would be too early for Sulimirski's scenario.[30]

Sulimirski thus based his entire interpretation on linking archaeological cultures with historically-attested ethnic groups, but he did not provide any systematic, objective basis for making these associations. He compounds this issue by employing circular logic – to prove that the Srubnaia Culture belonged to the early Scythians, he mentions that a dozen "Scythian" artifacts were found in a Srubnaia grave,[31] not considering the possibility that these socketed bronze arrowheads may have simply have been developed earlier, presumably before the Scythians existed as a distinct (or, indeed, indistinct) ethnic group (see §7.3).

Nicholls followed Sulimirski's interpretation, writing that the distribution of arrowheads is "of real significance" in that it can, he presumed, be used to trace the movements of the peoples associated with them,[32] particularly the Scythians and subsequently the Persians.[33]

While Cleuziou criticized previous studies of arrowheads because they lacked a precise typology and they rarely crossed the boundaries of traditional academic disciplines[34] (necessary to study the spread of socketed bronze arrowheads), he nevertheless implicitly accepted Sulimirski's association of arrowhead form with specific ethnic groups, asserting that a good knowledge of arrowheads is a significant contribution to the analysis of the movement of populations.[35] He therefore attempted to link the finds of such arrowheads with specific groups of people, principally the Cimmerians, Scythians and Medes.[36] In order to make the find of one 7th Century BC example from Palestine conform to this ethnic interpretation of distribution, he assumed it must have been deposited during a Scythian raid.[37] Likewise, he associated 6th Century BC examples from Palestine with the Median contingent of the Babylonian army.[38] Other means by which socketed bronze arrowheads could have turned up in Palestine – such as trade or local production – were not addressed.

In her study of Iron Age Iran, Medvedskaya not only associates socketed bronze arrowheads with the Scythians and Cimmerians, but asserts that the indigenous peoples of the Near East did not make them

[29] Sulimirski 1954, p. 288
[30] Catacomb Culture dates to to ca. 3000-2200 BC and the Srubna Culture to ca. 1600-1200 BC; see Mallory & Adams 1997, pp. 92 & 541.
[31] Sulimirski 1954, p. 288
[32] Nicholls 1958-1959, p. 129
[33] Nicholls 1958-1959, p. 130
[34] Cleuziou 1977, p. 188
[35] Cleuziou 1977, p. 188
[36] Cleuziou 1977, p. 191-192
[37] Cleuziou 1977, p. 191
[38] Cleuziou 1977, p. 192

at all (at least before the Achaemenid Period), so all finds of such can be confidently associated with invading Eurasian peoples.[39] Large numbers of socketed bronze arrowheads found in Egypt dating to the 6th-5th Centuries BC are attributed to foreign – Greek or Scythian – mercenaries.[40] Again, the possibility that the Egyptians themselves began to produce such arrowheads was not addressed.

Applying ethic labels to artifacts such as arrowheads raises the thorny issue of how legitimately material culture can be associated with ethnic groups. This dilemma is nicely summed up by Wiessner, who stated that, "although social information is contained in material culture, the correspondence is not straightforward."[41] As Sherratt observed, ethnic designations are inherently contextually dependent,[42] and the major characteristics that scholars have used to distinguish historically-attested ethnic groups – such as language and pottery forms – may be shared by multiple groups that nevertheless perceive themselves as ethically distinct. As indicated above, even when an ethnic label may be justifiably assigned to a kind of object, it simply means that the style of that object is associated with that group of people (they may, for example, have originated it or introduced it into that context in which it became popular). It does *not* mean that the artifacts in question were necessarily created by, or indeed used by and deposited by, representatives of that group.

Another cause for complication is that archaeological assemblages have frequently been given ethnic designations, and those that are not based on historical ethic groups often end up being treated as ethnic groups (the "pots and people" issue[43]). For example, the Bronze Age material from Mycenae was called the 'Mycenaean Civilization' and applied to all other sites were similar material was found.[44] The collection of characteristic objects and decoration styles called the "early Scythian" material culture was given that designation precisely because of such an assumed association. And by giving these materials the label "early Scythian," it becomes all too easy to simply assume that they are indeed characteristic of the historically-attested Scythians.

Ivantchik has demonstrated perhaps the most effective means for finding justifiable associations between historical ethnic groups and material cultures. By examining finds of "early Scythian" materials in areas (in Anatolia) where the Cimmerians (and not the Scythians) were historically attested,[45] he identified certain features as being characteristic of the Cimmerians and not the Scythians: bi-metallic war picks with bronze handles and iron blades and decorations in the shape of

[39] Medvedskaya 1982, p. 88
[40] Medvedskaya 1982, p. 93
[41] Wiessner 1983, p. 253
[42] Sherratt 2005, p. 26
[43] Roaf 2005, p. 313
[44] Sherratt 2005, p. 32
[45] Ivantchik 1997, pp. 14-15

raptors, and also rectangular stone- or stone-and-mudbrick walled tombs.[46] In doing so, Ivantchik demonstrated that, while the Cimmerians and Scythians are treated as distinct groups in Assyrian texts,[47] they shared the essentially the same "early Scythian" material culture, with only very few idiosyncrasies to distinguish one from the other.[48] Even this analysis is based on the assumption that these "early Scythian" finds should be related to the Cimmerians at all, yet it is not an unwarranted assumption, since the finds do date to the correct period, come from the correct area, and textual sources indicate that Scythians and Cimmerians were culturally related.[49]

Nevertheless, the finds at Karmir-Blur present a perfect example of why, even when a solid case can be made to link certain kinds of objects to certain groups of people, one should never assume that finds of those objects can be automatically attributed to them. The Urartian fortress at Karmir-Blur contained socketed bronze arrowheads stored in its magazines alongside iron leaf-shaped arrowheads, and furthermore, partially complete "early Scythian" objects were found there, indicating that the inhabitants of Karmir-Blur – presumably Urartians – were making Scythian-style objects themselves.[50]

It should also be noted that attempts have been made to link varieties of socketed bronze arrowheads with specific ethnic groups, specifically that bilobates are characteristic of the Cimmerians and trilobates characteristic of the Scythians.[51] Ivantchik demonstrated fairly clearly that while bilobates are indeed dominant in finds that can be associated with the Cimmerians, it likely has more to do with chronology. The identifiable Cimmerian sites date to the late Žabotin Period and the earlier part of the Kelermes Period, when bilobates were the principle form of socketed bronze arrowheads.[52] Trilobates are first attested in the later Kelermes Period (the later 7th Century BC),[53] by which time Scythians were reported to be in the same areas of the Near East as the Cimmerians, and clearly distinguishing between Cimmerian and Scythian finds becomes considerably more difficult.[54] Furthermore, as Cleuziou observed, the Mosul arrowhead mold (see §6.3.3.4), which casts two trilobates and one bilobate at the same time, shows that one should not assume that certain groups of people only used one or the other form.[55]

[46] Ivantchik 1997, p. 29
[47] Ivantchik 1997, p. 15
[48] Ivantchik 1997, p. 30
[49] Ivantchik 1997, p. 14
[50] Ivantchik 1997, p. 34
[51] Cleuziou 1977, p. 191 & 193; Medvedskaya 1982, pp. 90-91; Curtis 1984, p. 28
[52] Ivantchik 1997, pp. 25-28
[53] Ivantchik 1997, p. 26
[54] Ivantchik 1997, pp. 30 & 35
[55] Cleuziou 1977, p. 191

7.3. The origin of socketed bronze arrowheads

Sulimirski developed the hypothesis that socketed bronze arrowheads were developed in Transcaucasia under the rule of the Scythians because the area north of the Caucasus, from which the Scythians presumably originated, had neither a "technological background" that would allow the development of the trilobate arrowheads, nor, he asserts, are there any well-dated socketed bronze arrowheads from that region from before the 4th Century BC.[56] He suggested that the development of trilobates from arrowheads with high ribs can be followed there, and also that socketed bilobates are also first attested in that region, and so proposed that both socketed bronze bilobates and trilobates were developed in Transcausasia, most likely by the native inhabitants (who had a long history of bronze casting) under the rule of the Scythians in order to improve Scythian archery equipment.[57]

Sulimirski's hypothesis was largely accepted by subsequent studies, such as Snodgrass,[58] Moorey,[59] and Rothenberg.[60] However, more recent studies show quite unambiguously that socketed bronze arrowheads were attested in the Eurasian steppe long before they appeared in the Near East in the 7th Century BC.[61] Koryakova & Daire report that "pre-Scythian" tanged trilobates (along with socketed bilobates) were common in the steppe in the region of the Volga River and the lower Don in the 8th Century BC,[62] and Moorey reports that "precursors" to trilobates appeared in eastern Kazakhstan in the 9th Century BC.[63] Socketed bilobates have an even longer history, with well-dated examples from the Aržan kurgan in Siberia dating to the late 9th Century BC,[64] and even older examples from the later Andronovo Period (mid to late 2nd Millennium BC) from a variety of sites across the Eurasian steppe (see Figure 7.1).[65]

Thus, socketed bronze arrowheads were a foreign technology imported into the Near East from the Eurasian steep, where they had already been in use for centuries. However, the means by which this arrowhead form came to the Near East is very open to question.

[56] Sulimirski 1954, p. 310
[57] Sulimirski 1954, pp. 310-311
[58] Snodgrass 1964, p. 149
[59] Moorey 1971, p. 87
[60] Rothenberg 1975, p. 80
[61] Derın & Muscarella 2001, p. 197
[62] Koryakova & Daire 2000, p. 65, also Medvedskaya 1982, p. 86
[63] Moorey 1980, p. 65; unfortunately, he provides no citation to support this claim.
[64] Hellmuth 2014, p. 5
[65] Brentjes 1995-1996, pp. 203 & 205, fig. 37; Kuzmina 2008, pp. 156, 175, 183, and 193; Cleuziou 1977, p. 189; Medvedskaya 1982, p. 87

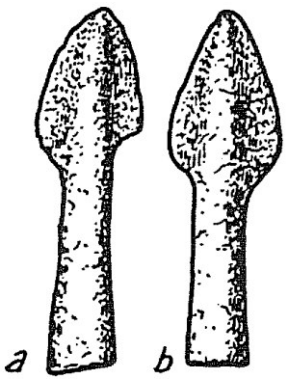

Figure 7.1: Andronovo (mid to late 2nd Millennium BC) socketed bilobates from Siberia; after Brentjes 1995-1995, p. 205, fig. 37 (not to scale).

Earlier studies generally assumed that they were brought to the Near East by invading Scythians and Cimmerians.[66] While Yamauchi cautioned that socketed bronze arrowheads were used by other groups in the Near East besides Scythians,[67] he nevertheless proposed that those dating to the 7th Century could be attributed to "marauding Scythians" and those of the 6th Century to Scythians who remained in the Near East to serve as mercenaries.[68] On the other hand, Medvedskaya, as stated above, went so far as to insist that socketed bronze arrowheads were not used by the indigenous peoples of the Near East, and so all such arrowheads found in the Near East before the Achaemenid Period were deposited solely by "representatives of the Eurasian steppe."[69]

This illustrates the danger of assigning ethnic labels to styles of object: one tends to forget that it is a style referred to and not a concrete physical origin. The possibility that these arrowheads forms, though originally developed in the Russian steppe, reached the Near East by means other than direct military conflict tend to be ignored. Yet the possibility that they were obtained by trade certainly remains open, and there can also be no doubt that Near Eastern peoples began to make their own copies of these styles of arrowheads.

Indeed, the first attested socketed bilobates in the Near East appear to be just such local copies. The socketed bilobates from Hasanlu IVB, dating to the 8th Century BC (likely to the earlier portion of that century, see §8.6.1), were made of iron rather than the more conventional cast bronze. Some were given midribs to make them more closely resemble cast bronze examples, but others have the lenticular section that is easier to forge in iron.[70] The unusual choice of iron as the material suggests that the local inhabitants, having been exposed directly or indirectly to socketed bronze arrowheads

[66] e.g. Curtis 1984, p. 28 or Rothenberg 1975, p. 80
[67] Yamauchi 1983, p. 94
[68] Yamauchi 1983, p. 95
[69] Medvedskaya 1982, p. 88
[70] see Thornton & Pigott 2011, p. 143, fig. 6.4

from the north, sought to copy them, but did so in their preferred material for arrowheads rather than bronze, even though forging the sockets would have been more difficult than casting them.

As Dušek observed, effective weapons spread rapidly in the past just as in the modern world, thus using such successful weapons to determine ethnicity is highly problematic.[71] Muscarella observed that if socketed bronze arrowheads were introduced by a specific ethnic group (or related ethnic groups, such as the Scythians and Cimmerians), these arrowheads may have indeed for a time "functioned as a recognizable ethnic identity marker,"[72] but only until they began to be borrowed by other groups of people. The socketed bronze arrowheads found alongside iron arrowheads in the magazines of Karmir Blur[73] indicate that this borrowing must have happened very early in the contact between "early Scythian" people and indigenous peoples of the Near East. Thus, socketed bronze arrowheads cannot be used as an ethnic marker at any point during their use in the Near East, even from their earliest attestation.

The origin and spread of socketed bronze arrowheads is a case study in how ethnic identity cannot be determined by a single kind of artifact. As Ivantchik demonstrated, a more comprehensive assemblage of characteristic objects or decorative styles is necessary in order to identify a material culture. And even then, the link between material cultures and specific ethnic groups, whether historically attested (such as the Cimmerians and Scythians) or presumed solely on the basis of the material assemblage (such as the case with the Minoans) must always be tempered by the possibility of these object or decoration styles spreading by trade or copying rather than by the actual presence of representatives of the ethic group in question.

7.4. Conclusions

It is clear that a simple equation of an artifact type with an ethnic group is not tenable. While Neo-Assyrian and Neo-Babylonian texts did indeed apply ethnic designations to types of archery equipment, the nature of that identification is never stated, and most likely it relates to a style of object that was associated with that ethnic group. But the very fact that Babylonian soldiers were using "Cimmerian" arrows, for example, indicates that whatever the "Cimmerian" designation of the bow signified (shape of arrowhead, length, materials made of, place of manufacture, etc.), the "Cimmerian arrow" was clearly used by non-Cimmerians. Ivantchik, however, demonstrated a compelling method for linking artifact types to historically-attested ethnic groups, however it must be stressed that he examined assembalges of artifact types, not a single type of artifact, and that the

[71] Dušek 1964, p. 57
[72] Muscarella 1989a, p. 107
[73] Dandamaev & Lukonin 1989, p. 226

connections between textual sources and archaeological finds that are favorable to the study of the material culture of the Cimmerians may not be available for studying other ethnic groups and artifact types.

In the case of socketed bronze arrowheads, it is certain that they first originated in the Russian steppe, however this took place long before the Scythians or Cimmerians are likely to have existed as distinct ethnic groups. While Ivantchik did make a compelling case linking them to the historical Cimmerians, it does not eliminate the possibility that socketed bronze arrowheads reached the Near East by trade before they or any related groups arrived in person. Socketed bilobates found in contexts with other characteristically Cimmerian artifacts may be linked to the Cimmerians with some confidence, but it does not mean that all socketed bilobates were necessarily produced or used by the Cimmerians (and thus a trace of their activities). Socketed bronze arrowheads were adopted very rapidly by other groups in the Near East, and so such arrowheads cannot by any means be considered to be a marker of ethnic identity.

8. Arrowhead Finds

8.1. Sites surveyed

The first criterion for site the selection of sites to be surveyed was that each **region** (defined here as Northern Iraq, Southern Iraq, Iran, Transcaucasia, Syria, and the Levant) should be represented by at least two sites. In this way, the idiosyncrasies of any individual site will not be taken as usual for the region in general. Second, sites with **large volumes** of finds are preferred, as they offer a greater scope to study variation in forms at a single location, as well as generally offering a greater variety of forms on the whole. In addition, sites that have yielded **unique finds** are also desirable, even if they have an otherwise low quantity of arrowheads. A further very significant qualification is the **quality of the publication** of the arrowheads – those with details and drawings or photos of individual arrowheads are preferred. Finally, sites that figure significantly in **previously published discussions** of arrowheads are given preference.

As a result of the selection criteria, Transcaucasia is very strongly represented, as Transcaucasian sites have yielded a particularly large variety of arrowheads. Southern Iraq, on the other hand, is poorly represented, as few sites have well-published and significant finds of arrowheads from the early 1st Millennium BC. Babylon, for example, cannot be included because although many early 1st Millennium BC arrowheads were found there, they remain largely unpublished.

Exceptions to the publication rule have been made for both Nimrud and Assur, as I have been able to study the collections from those sites directly. The British Museum kindly allowed me to examine and photograph their collection of 268 arrrowheads from Nimrud, most of which had not been previously published. At the same time, I also had the privilege of working with the finds from Carchemish, enabling me to make accurate measurements. The Assur Project of the Deutsche-Orient-Gesellschaft and the Vorderasiatisches Museum Berlin also granted me permission to study the arrowheads from Assur, the vast majority of which are as yet unpublished.

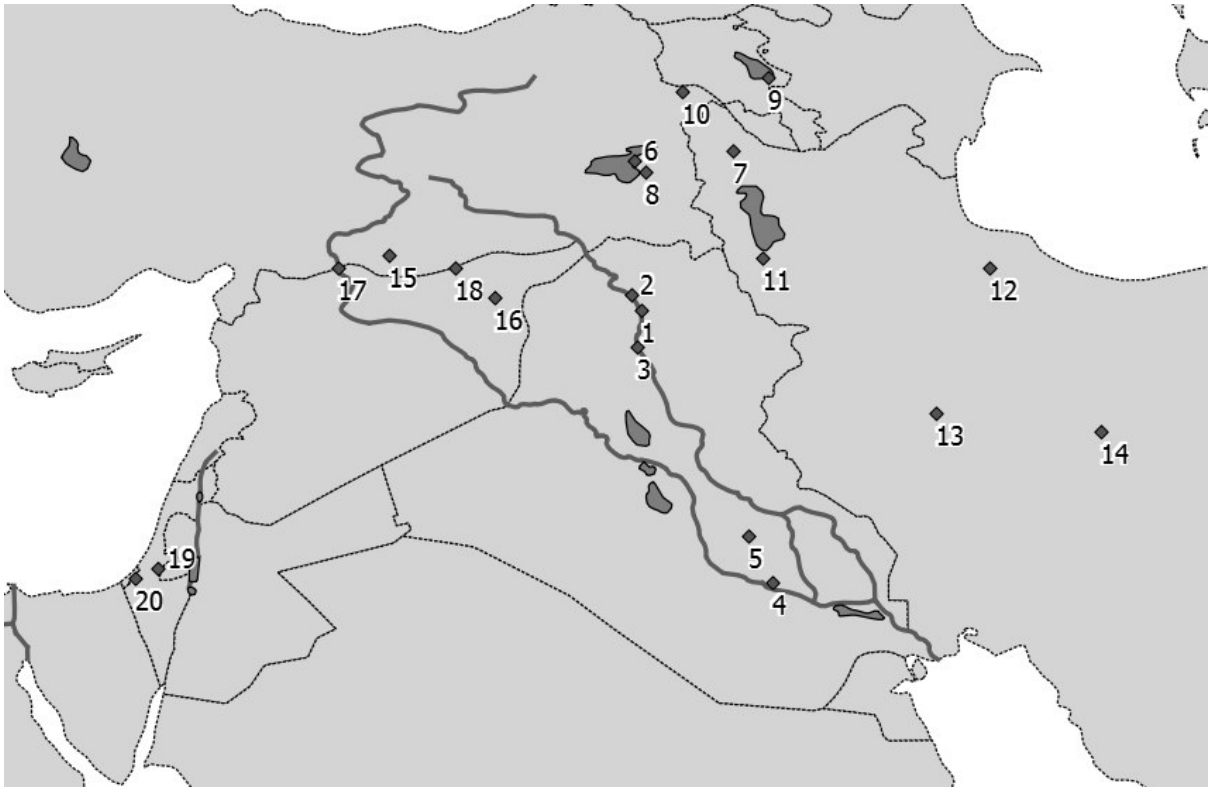

Figure 8.1: Sites covered in this survey. 1. Nimrud, 2. Nineveh, 3. Assur, 4. Uruk, 5. Nippur, 6. Ayanis, 7. Bastam, 8. Toprakkale, 9. Karchaghbyur, 10. Igdyr, 11. Hasanlu, 12. Marlik, 13. Nush-i Jan, 14. Sialk, 15. Sultantepe, 16. Tell Knēdiğ, 17. Carchemish, 18. Fakhariya, 19. Lachish, 20. Gerar (basemap and shape files courtesy of Natural Earth).

8.2. Associating destruction layers with historical events

Since as early as Schliemann's excavations at Troy, archaeologists and historians have attempted to link destruction layers found in archaeological sites with events recorded in historical sources.[1] Indeed, in Syro-Palestinian archaeology, the excessive impulse to correlate every destruction layer found with an event mentioned in historical texts (and every destruction mentioned or implied in historical texts assigned a destruction layer found by archaeologists) has lead Leonard to label it the "find-a-pharaoh" system.[2] Some of these associations are plausible, and some are less so, however there has not been a standard set of objective criteria for determining how valid the association of a destruction layer with a historical event is.

As many of the arrowhead finds discussed in this work come from destruction levels that are associated with historical events – specifically, those at Nimrud, Nineveh, Assur, Sultantepe, Carchemish and Lachish – and because such associations would be of the greatest value if that can be proven beyond a reasonable doubt, objective criteria for analyzing these associations are necessary.

[1] Sherratt 2005,p. 25
[2] Leonard 1988, p. 330

The historical accounts themselves present a number of issues demanding caution. Their accuracy cannot be guaranteed, particularly when there is only a single source referring to an event and thus no ability to cross-check it. Their statements may sometimes be vague, and even if the text says a city was captured or booty derived from it, unless it specifically states the city in question was destroyed, such a destruction cannot be assumed since the city could have surrendered without a fight or could have been looted without being burnt. A perfect example is Ebla. Matthiae, the original excavator, attributed the destruction of Ebla to either Sargon of Akkad or to Narām-Sîn, since both have texts mentioning that they campaigned as far as Ebla, though neither explicitly state that Ebla was destroyed.[3] Archi & Biga, however, marshaled compelling evidence that the destruction of Ebla was not at the hands of either Akkadian king, but rather by Ebla's former ally Mari.[4] Thus, one should exercise extreme caution in relating events from historical texts to archaeology, since not only may the text be innacurate, but even if it is accurate, they will rarely present a complete and objective vew of occurances. Even in the best cases, then, it is not possible to be absolutely certain that an association between a destruction layer and a historical event is valid. We must therefore consider the relative probabilities of each case, and do so in a systematic manner.

The first problem that destruction layers present us is the nature of the destruction: conflict or accident. Historical accounts tend to record destructions that are caused by wars, but buildings that can be burned intentionally can be burned accidentally as well. For example, when a destruction layer was found in a palace in Qatna, it was assumed to be the result of the campaign of Suppiluliuma I in Syria.[5] However it was subsequently found that the burning was limited to a small area of the palace and not at all evident in two other nearby contemporary palaces.[6] While that does not prove that this destruction is not from Suppiluliuma's campaign, it does rather argue against it, since why would only one part of one palace be destroyed and the rest spared? The small scope of the fire seems to suggest an accidental rather than deliberate origin. A similar case exisits at with the Neo-Assyrian house excavated at Tell Sheikh Hamad (ancient Dūr-Katlimmu), parts of which were destroyed by fire. Kühne proposed that this destruction was the result of a raid by Nabopolassar in 612 BC simply because the "Rotes Haus" which covers it contained four texts dating to Nebuchadnezzar II.[7] Furthermore, given that only a portion of the house was destroyed by fire, there is a reasonable possibility that the destruction was accidental rather than intentional.

[3] Matthiae 1989, pp. 164-165 & Matthiae 2007, pp. 23-24
[4] Archi & Biga 2003, p. 35
[5] Luciani 2008, p. 42
[6] Luciani 2008, p. 42
[7] Kühne 1993, p. 81

Therefore, in order to be sure that the destruction was caused by warfare, the layer should cover a significant portion of the site, not just a single building, and the layer should also contain some warlike objects, such as discarded weapons, arrowheads, or the remains of those killed in the conflict. Other possible indications of deliberate destruction are if materials were gathered in order to be burned, such appears to be the case in Court 31 of the palace at Khorsabad, where a large amount of ash with fragments of bronze that Loud speculated may have been from the deliberate burning of the furniture and doors of the Temple of Ningal.[8] Any of these factors can be taken as evidence of deliberate destruction.

Once it has been determined, if possible, that the destruction was accidental or deliberate, the dating of the artifacts in that destruction layer must be examined to determine if they correspond to the date of the event in the historical sources. Typically, the date of the event will be much more precise than the dating of the objects, and therein lies the great value of a valid destruction-event association. If the destruction layer can be dated precisely, then the deposition of the items found within it can also be dated precisely.

However, simply matching the date range when certain kinds of artifacts were in use to the date of a historical even is not enough. After all, the historical record for the ancient Near East is far from complete, and there may have been destructions that were not recorded in the surviving written sources, or if the source was written some time afterwards, it may inaccurately date the destruction, conflate multiple destructions, etc.

Therefore, it is necessary to have a third datum, reflected in both archaeological and textual sources, in order to, in effect, triangulate the validity of the association. Different circumstances may offer various kinds of other data, but for the early 1st Millennium BC, changes in settlement patterns can provide this third datum. The most clear and significant change in settlement patterns would be an abrupt abandonment (or near-abandonment) after the destruction, which several sites examined in this study exhibit.

I therefore propose a four-tiered hierarchy of the validity of associating a destruction layer with a historical event: firm, probable, possible, or no association.

- A **firm association** occurs only when multiple forms of evidence agree. Dating of artifacts (or C_{14} dates) in destruction layer agreeing with the historical account, as well as significant changes in the settlement patterns of the site, also reflected in the historical

[8] Loud 1935, p. 109

accounts. E.g. Assur and Nineveh, which were scarcely inhabited after destruction. The Halzi Gate in Nineveh is perhaps the best example.

- A **probable association** occurs if either one or the other happens, but not both. For example, the destruction layer at Carchemish with artifacts that generally agree with the historically reported attack by Nebuchadnezzar in 605, but lacks a major change in settlement patterns thereafter to confirm it.

- A **possible association** occurs when the dating of artifacts in a destruction layer could correspond to a destruction event in the historical accounts, however either there are multiple destruction events that could plausibly be assigned to the destruction or the dating of the layer is vague. For example, the destruction layer at Sultantepe, which is not mentioned as being attacked in historical texts, though it is not unreasonable to assume that it had been attacked around the same time as Harran, and the objects found broadly agree with that date.

- **No association** occurs when there is a significant difference between the dating of the artifacts found in the destruction layer and the proposed date for the historical event, precluding any plausible association between the two.

The most important ramification of this hierarchy is the dating of artifacts. Artifacts from destruction layers should only be dated to a specific historical destruction if there is a firm association between the destruction layer and the historical event. In all other cases, artifacts should be dated only on their own merits (stylistic comparison with objects from other sites, etc.) or C_{14} dating of the destruction layer. Naturally, in all of these cases, the destruction layer provides only a specific *terminus ante quem* date for the artifact. How old they were when deposited is another matter.

8.3. Northern Iraq

8.3.1. Nimrud

Nimrud (Assyrian Kalḫu) has traces of Halaf and Ubaid period settlements, and some amount of construction was carried out there in the Middle Assyrian period (principally under Shalmaneser I), however it expanded significantly when Assurnasirpal II made it his capital.[9] Nimrud was destroyed at the end of the Neo-Assyrian Period, and in subsequent periods appears to have only been very

[9] Curtis 1997, p. 141

lightly inhabited[10] until the Hellenistic period, when there was a significant settlement on the citadel. However, Nimrud dwindled again until it was finally abandoned in the Sassanian period.[11]

Nimrud has yielded the largest collection of arrowheads preserved in the Assyrian heartland. There are a total of 268 arrowheads from Nimrud at the British Museum, mostly excavated in Fort Shalmaneser and around the fortification walls surrounding Fort Shalmaneser.[12]

The dating of this major destruction was associated by Oates with the Median and Babylonian attacks of 614 and 612, as mentioned in the Babylonian Chronicle.[13] However, the Babylonian Chronicle does not mention Nimrud specifically among the cities attacked. Oates observed that Nimrud lay directly in the path the Medes must have taken during both campaigns, and so assumed that Nimrud must have been destroyed then, and the omission of its name from the Babylonian Chronicle must merely indicate that it "offered little resistance."[14] This view appears to have been universally accepted and there do not appear to have been any attempts at questioning it. And there are good reasons for the supposition that Nimrud was destroyed by the Medes in 614 or 612 BC. As Oates indicated, it was in the path of the Medes, and it does not seem very probable that the Medes would leave a major Assyrian city intact while they pressed on to targets deeper within Assyria, thus allowing the defenders from Nimrud to attack them from the rear. It can also scarcely be imagined that it would have been destroyed before 614 BC, since the historical texts record no previous attacks in the Neo-Assyrian Period. Furthermore, if one of their major cities of Assyria had been destroyed significantly before 614, one would expect that it would have been re-inhabited on a substantial scale afterwards. And if Nimrud had survived the attacks of 614 and 612, one might presume that the surviving Assyrian administration would have moved there, since it was nearby and well-fortified, rather than distant Harran. The Babylonian Chronicle indicates that the Assyrian government moved to Harran after 612 BC and that Assyrian control over the Assyrian heartland was clearly lost, since the Babylonian army plundered and marched through Assyria in the following several years, until at least 608 BC.[15] However, the fact that the Assyrian heartland continued to be attacked for at least two years following the fall of Nineveh shows that there must have still been targets to attack there, possibly including Nimrud. However, since the inhabitants of the squatter settlement in the ruins of Fort Shalmaneser still used Neo-Assyrian style pottery,[16] if Nimrud did survive the attacks of 614 and 612 BC, it can not have survived them by very long. Thus, destruction level at Nimrud has a **probable, not a firm, association** with the destruction of 614-612 BC. Because of the ceramics in

[10] Curtis 2003, p. 159
[11] Curtis 1997, p. 141
[12] Stronach 1958, p. 170-171
[13] Oates 1961, p. 9
[14] Oates 1961, p. 9
[15] Wiseman 1956, pp. 18-20
[16] Oates 1961, p. 10

the post-destruction squatter settlement, the destruction, and thus the dating of the arrowheads, can be assigned to the end of the 7th Century BC.

Fort Shalmaneser, in addition to serving the function of an *ekal māšarti*, also served as a major bastion in the fortifications of Nimrud, and the distribution of large quantities of arrowheads throughout the palace, and around the walls surrounding the palace, indicates that Fort Shalmaneser was a major focus for the battle which resulted in the city's destruction. The finds within the palace could represent arrows fired during a storming of Fort Shalmaneser, but many of them were likely also fired by the attackers from outside the walls. Because the attackers would have tried to fire their arrows at a sufficiently high trajectory to clear the wall (and therefore be able to hit anyone on it or just behind it), many undoubtedly carried on and landed on the palace. Many arrowheads have broken points, which indicate they struck a hard surface, such as the walls of the city or of the palace.[17]

A small minority of arrowheads were found in circumstances not directly linked to the destruction of the city. A cache of 8 small iron arrowheads with leaf-shaped blades and unstopped tangs (5 of which appear here, Nimrud 245-249) were found in a jar sunk in the floor of room SE 8 in Fort Shalmaneser.[18] While it seems unlikely that arrowheads were normally stored in such a manner, storage was clearly the purpose of this deposit. Another lone arrowhead, Nimrud 250, was found in NW 14 of Fort Shalmaneser, a nearly empty magazine.[19] It could have been stored in this room, and was inadvertently left behind when others were removed, however it also may well have been deposited during the storming of the fort (possibly falling into the room when the ceiling collapsed).

An unknown quantity of the Nimrud arrowheads remains in Baghdad, and are unfortunately not currently available for study. Furthermore, there is no indication of what rationale, if any, was used in choosing the finds that were brought to the British Museum. The great preponderance of the small, basic leaf-shaped iron arrowheads suggests that the British Museum collection is, nevertheless, more or less representative of the relative proportions of arrowheads used during the assaults on Nimrud at the end of the Neo-Assyrian Period, since clearly they were not chosen for their high quality.

Stronach created a typology (Figure 8.2) for the large quantity of arrowheads found in the vicinity of Fort Shalmaneser,[20] providing drawings of one or two examples of each type.

[17] Stronach 1958, p. 171
[18] Oates 1959, p. 114
[19] Oates 1959, p. 102
[20] Stronach 1958, pp. 171-172

Type	Description	Example
1	small, leaf-shaped	Nimrud 70
2	medium leaf-shaped, stopped tang	Nimrud 3
3	leaf-shaped, medial ridge, stopped tang	Nimrud 233
4	barbed (with waisted blade)	Nimrud 250
5	socketed copper leaf-shaped with side barb	Nimrud 265
6	socketed copper trilobate with no side barb	Nimrud 268

Figure 8.2: Typology of arrowheads from Nimrud; after Stronach 1958.

Stronach's Type 1 (corresponding to Type 5a in this work) arrowheads were by far the most common found at Nimrud. Stronach observed that this form duplicates a bronze arrowhead form used in the Middle Assyrian period at Assur.[21] The similarity is further marked by the fact that the Assur examples were not cast, like usual bronze arrowheads, but rather forged. Because similar arrowheads from the Neo-Assyrian Period were found at Nineveh and Sultantepe as well, Stronach concluded that his Type 1 arrowheads were an indigenous Assyrian creation, adopting a Bronze Age form to iron. However given that all three of these cities were presumably destroyed by the same groups of people, the arrowheads could in principle belong to the attackers rather than the defenders. Nevertheless, given that Middle Assyrian predecessors are attested at Assur, Stronach's Type 1 arrowheads most likely are indeed locally manufactured Assyrian arrowheads.

Type 2 in Stronach's typology are leaf-shaped arrowheads with lenticular or rhomboid sections and stopped tangs (Type 5b and 5g in this work), usually somewhat larger than Type 1 arrowheads. He observes that they are found in considerable abundance, and are also not uncommon in Urartu.[22] Type 3 have a midrib and stopped tang (Type 5q).

Type 4 is represented by one arrowhead, Nimrud 250, which is barbed and made of iron. Stronach proposes that it is a type foreign to Assyria, coming from the north.[23] Indeed, many Urartian sites such as Ayanis, Karmir Blur and Toprakkale have yielded similar arrowheads (see Types 5b-14, 5d-14 and 5z-14 in this work). The Nimrud arrowhead is unfortunately badly corroded, but a careful examination suggests that it may have originally had recessed edges, which are also in evidence on some of the Urartian arrowheads. Due to the ease with which arrows may be re-used, the presence of a single characterically Urartian arrowhead at Nimrud does not necessarily argue for an Urartian presence at the fall of Nimrud. The arrowhead could have found its way to Assyria as booty, or, indeed, could have been manufactured locally, as it cannot be ruled out that Assyrians did not adopt this style of arrowhead as well, even if on a smaller scale than in Urartu. As discussed above, it was

[21] Stronach 1958, p.171
[22] Stronach 1958, p. 171
[23] Stronach 1958, p. 171

found alone in a magazine of Fort Shalmaneser, where it could have been stored (if it had been booty) or deposited during the attack on the fort.

Types 5 and 6 (Types 2-3 and 3a-2, respectively) generally account for the socketed bronze arorwheads found at Nimrud, however they do neglect the differences between the long socketed Type 3a-2 and the short-socketed Type 3a-1 (Nimrud 265).

8.3.2. Nineveh

Nineveh has been excavated by numerous expeditions, beginning with Layard in the 1846.[24] Nineveh was already occupied in the 2nd Millennium BC, so the dating of finds in not necessarily always straightforward. However, the only substantial collection of arrowheads from Nineveh yet published can be dated to a single year. The Halzi Gate, on the southeast side of the city, was destroyed along with the rest of the city when it finally fell in 612 BC. The arrowheads found in the ruins date to that destruction.

The dating of the destruction is quite certain. The Babylonian Chronicle states that Nineveh was taken by the Babylonians and Medes after a siege lasting from Sivan to Ab of 612 BC, at the end of which the city was taken, looted and destroyed.[25] Since the artifacts from the destruction level correspond to a late Neo-Assyrian date and after the destruction, the site was largely abandoned (as implied in the textual sources, which state that it had been turned into a ruin mound),[26] this destruction level has a **firm association** with the attack of 612 BC, and thus the deposition of the artifacts from that destruction layer can be assigned to that date.

The destruction at the Halzi Gate was clearly part of the widespread destruction of 612 BC. The remains of twelve individuals were discovered lying on the pavement in and around the gate, and their deaths must have occurred at the time of the destruction of the gate. Some show evidence of wounds that may have been the cause of death (Skeletons 2, 5, 7 and 12), while others show injuries from the gate collapsing on them as it burned (such as Skeletons 1, 5, and 8). Some of the individuals – Skeletons 1, 5, 7 12 and perhaps A – were most likely soldiers, as they show multiple old wounds that had since healed and their joints show stress patterns consistent with habitual archery or, in the case of Skeleton 12, perhaps the use of a sword. However, some of the Halzi Gate victims were non-combatants, as six of them were pre-adolescent children (Skeletons 2, 4, and 8-11).[27]

[24] see Layard 1853a; 'Nineveh' in *Reallexikon der Assyriologie*, vol. 9, has a complete list of excavations up to 1990
[25] Wiseman 1956, p. 16
[26] Curtis 2003, p. 160
[27] Pickworth 2005, p. 310

The tragedy that occurred at the Halzi Gate is difficult to interpret with any precision. If we assume that the victims were all killed at the same time (rather than perhaps one group being killed first and then a second group caught in the collapse of the gate), a compelling reconstruction of the events that led to this pattern of deposition could be that several Assyrian soldiers were attempting to escort a group of children – perhaps high-status children – out of the city in a bid to escape when they were pinned down by enemy fire in the gate, where they were forced to remain until it collapsed upon them.[28] All of the adults were males who appear to have been soldiers, and all of the children are substantially younger (pre-adolescent). The one exception is Skeleton 6, who was a young man of 17-18. He is old enough that he could be a soldier, however no weapons save one arrowhead were found in his vicinity, while a silver earring and a stamp seal attached to a fibula were all found on his person, suggesting that he was a high-status individual.[29] Indeed, Pickworth suggests that priviledged individuals were amongst the victims due to the nature of the small finds.[30]

Unfortunately, other considerations make the above scenario if not untenable, then certainly impossible to prove. There is nothing in the gate to identify the ethnic or national identity of the individuals beyond any reasonable doubt. Furthermore, even though the adults appear to be soldiers, they do not appear to have any weapons. Of course, there is the possibility that they were first killed and then, before the gate collapsed on them, there was sufficient time for their bodies to be looted. However the presence of several valuable objects, such as silver earrings and the stamp seal, makes looting of the bodies seem less probable, as small, easily-carried, high-value items would not likely have been left behind by looters. In addition, as mentioned above, it is also impossible to determine if all the individuals were killed at the same time.

It is unfortunate that the ethnicity of the Halzi Gate victims cannot be determined, since it could indicate what sort of arrowheads their opponents – Medes and Babylonians – were using. All but one of the arrowheads are socketed bronze, both trilobate and bilobate. The sole exception is a poorly preserved iron arrowhead with a stopped tang. Also noteworthy are the socketed "triangulate" arrowheads (Nimrud 6-8), which are in effect socketed triangular bodkins. Two of the examples – Nineveh 7 and 8 – are listed by Pickworth as "transitional triangulate/trilobate," meaning that the blades are not quite wide enough to encompass, so that the arrowhead has distinct (if very thick) blade rather that the completely triangular section of a standard triangular trilobite. This feature is evident on other early triangular trilobate arrowheads (such as Sialk 73, Type 3b-2, and Ayanis 107, Type 3b-

[28] I am indebted to Fabrice De Backer for raising the possibility of this reconstruction during a personal conversation (April 16, 2009), though he speculated that at least Sketelon A and perhaps some of the soldiers just inside the gate, such as Skeletons 1 and 3, were those of attackers, while the children and Skeleton 12 were Assyrians.
[29] Pickworth 2005, p. 310
[30] Pickworth 2005, p. 312

11). This strongly suggests that the triangulate arrowhead evolved directly from conventional trilobates.

It is possible that the soldiers' weapons were not missing at all – several of them were evidently archers, and the arrowheads found with them could in fact be from their own ammunition. However, one of the children – Skeleton 4, a male of ca. 11 to 12 years of age – had a trilobate embedded in his left fibula, clear evidence that it was fired at him.[31] Since is it most likely that the children were Assyrian, this is the best evidence that the Medes and/or Babylonians were indeed shooting trilobate arrowheads. It does not, however, offer any clues as to whether the Assyrians were also using them, since the other socketed bronze arrowheads could equally be the ammunition of the attackers or defenders.

If the victims were shot by archers who were outside the gate, it would also tell us something about how socketed bronze arrowheads were used. Normally, socketed bronze arrowheads are quite small and light, which suggests that they were principally intended for long-range shooting. However, to fire into the narrow confines of the gate, the archer would have to be close enough to obtain a sufficiently flat trajectory to allow the arrow to enter. Thus the light socketed bronze arrowheads were intended to be multi-purpose, and allow shooting at any range. This supposition is supported by the fact that while leaf-shaped arrowheads often come in a wide variety of sizes, socketed bronze arrowheads are normally very homogenous in terms of both size and weight.

Note that two arrowheads from Nineveh which were not published in Pickworth's 2005 article were discussed by her in a personal communication with me, and all measurements of arrowheads were kindly provided by her.

8.3.3. Assur

Assur has been the subject of numerous archaeological investigations, beginning in the mid 19th Century, and carried on much more extensively, principally by German institutions, in the 20th Century.[32] Unfortunately, while Assur produced an enormous volume of finds, they have only recently begun to be published in a systematic manner by the Assur Project, operated jointly by the Deutsche Orient-Gesellschaft and the Vorderasiatisches Museum in Berlin. The majority of artifacts come from the excavations carried out in the early 20th Century under the supervision of Walter Andrae, and while Andrae was in many ways a very meticulous excavator, the collection suffers from much the same lapses or vagarity in data that other early excavations exhibit. For example, while the

[31] Pickworth 2005, p. 310
[32] see Andrae 1977 for an overview of excavations in the early 20th Century.

find catalog for Assur lists the individual squares in which artifacts were found, it rarely gives any indication of the dating of the finds, which, given that Assur was inhabited over such a long period, makes it exceedingly difficult to know which of the artifacts date from the early 1st Millennium BC.

Haller has made a detailed study of the graves at Assur, which has resulted in reasonably secure dates for the arrowheads found in tombs.[33] Unfortunately, only 3 tombs containing arrowheads were dated to the early 1st Millennium, and they contained a mere four arrowheads between them. Grave 283 contained both a very small square bodkin (Assur 4, Type 1c-1) and a leaf-shaped arrowhead with a flattened rib (Assur 2, Type 5v-1).[34] Grave 188 contained a single ribbed arrowhead (Assur 3, Type 5q-3)[35] and Grave 259 contained a bronze trilobate (Assur 1, Type 3a-1, see below for discussion).[36]

It is unfortunate indeed that the finds from Assur were not more accurately recorded, since the destruction levels of Assur are some of the few where a firm association with historical events can be established. The Babylonian Chronicle states that Assur was taken and looted in 614 by the Medes and Babylonians,[37] and it may have been looted again in 612 BC.[38] Like other Assyrian cities, it was largely uninhabited after these destructions, with only a small-scale squatter settlement, thus giving the destruction layers a **firm association** with the destruction of 614, at least.

Andrae noted that 157 socketed bronze arrowheads were found around Tower C, and associated them with the destruction of the site.[39] Unfortunately, the only arrowhead specified by Andrae as coming from this area that has a photo available is Assur 49, a hooked trilobate (Type 3a-3).[40] Numerous other socketed bronze arrowheads appear in photographs of finds from Assur or in the Assur collection of the Vorderasiatisches Museum Berlin. While many of them were doubtless among the 157 that Andrae mentioned coming from this area,[41] we cannot be certain which ones they are. Therefore none of them can be assigned any certain date. I have nevertheless included them for the sake of comparison, and because their form indicates they must date from the later Neo-Assyrian Period or shortly thereafter.

One bronze trilobate presents something of a puzzle. Assur 1 is the only dated socketed bronze arrowhead from Assur. It was found in a child's burial, which Haller dates to the Neo-Assyrian

[33] see Haller 1954
[34] Haller 1954, p. 28
[35] Haller 1954, p. 23
[36] Haller 1954, p. 26
[37] Wiseman 1956, p. 14
[38] Curtis 2003, p. 161
[39] Andrae 1974, p. 143
[40] Item No. 1372, see Andrae 1913, p. 143
[41] Andrae 1913, p. 140

Period.[42] If this was indeed an Assyrian burial, it may imply that the Assyrians themselves were using trilobate arrowheads. However, Haller does not provide any detail on the reason for his dating the grave to the Neo-Assyrian Period, and its only other contents were a few glass beads, of little use in dating. As similar burials are known from Assur dating to after the end of the Neo-Assyrian Period,[43] thus the burial, as well as Assur 1, may well date to sometime after 614-612 BC.

Three very small, bronze bodkin-type points (Type 1c-1) were found at Assur. While two (Assur 50 and 51) lack any secure date, the third (Assur 4) was found along with a ribbed arrowhead in a tomb (Grave 283) identified by Haller as dating to the Neo-Assyrian Period.[44] Because all three closely resemble each other, with square sections, fairly angular shoulders but no stop, Assur 50 and 51 have been included as possible Neo-Assyrian artifacts.

Three arrowheads with similar wide stops – Assur 58 (Type 5y-22) as well as Assur 59 and 60 (both Type 5e-20) - are also attested among the arrowheads from Assur. The Assur Project find catalogue suggests that Assur 58 might be "Arabic," while the other two have no date assigned to them. I had included them in this work since their wide stops resembles those on Carchemish 25 and 26 (Type 5e-20, like Assur 59 and 60). However, subsequent research has revealed that all three of these examples from Assur date from the Hellenistic period (see Type 5e-20).

Also of interest are four deltoid points, Assur 54-57 (Types 5q-22 and 5r-22). They are not completely identical, since one of them has a bulbous stop, yet they nevertheless bear a close resemblance to each other. None are dated in the Assur Project find catalogue, however they have all been included here as possible early 1st Millennium BC objects due to their resemblance to Sialk 77 (Type 5r-4) and Sialk 71 (Type 5r-20). All examples have relatively short, heavy deltoid blades with thick midribs and correspondingly wide stops (or even bulbous stops, in the case of the Sialk examples and Assur 56).

8.4. Southern Iraq

8.4.1. Uruk

Uruk had both a very long period of settlement beginning in the 5th Millennium BC, and has been the subject of numerous excavations, beginning in 1849.[45] It is therefore fortunate that a careful and comprehensive publication of the small finds has been made, two of which contain arrowheads.[46] The

[42] Haller 1954, pp. 26-27
[43] Haller 1954, p. 29
[44] Haller 1954, p. 28
[45] Boehmer 1997, p. 294
[46] Van Ess & Pedde 1992 (AUWE 7) and Pedde *et al* 2000 (AUWE 21, part 1)

finds in both publications are broken down by into chronological categories: pre-Old Babylonian, Old- to Middle Babylonian, Neo-Babylonian, Late Babylonian (essentially Achaemenid/Hellenistic), Parthian, and undated. For the purposes of this study, only those categorized as Neo-Babylonian will be considered, of which there are a total of 29 examples.

A number of noteworthy arrowheads were found at Uruk. For example, Uruk 14 appears to be a tanged arrowhead mimicking the form of a socketed bilobate (see Type 5q-2), and Uruk 12, a rare pyramidal bodkin (see Type 1c-1). The Neo-Babylonian date of the latter is not very secure, however; it was found in a Neo-Babylonian house, but directly under the surface, and so may represent a later intrusion.[47]

A tanged bronze arrowhead (Uruk 13) was also discovered at Uruk. It consists of a small leaf-shaped blade with a relatively long stop above the tang. Van Ess & Pedde observe that it closely resembles the iron arrowhead Uruk 4,[48] and while the bronze arrowhead is smaller in some dimensions, the similarity is indeed striking. The condition of the arrowhead does not allow one to definitively conclude if it was forged or cast, but its general form suggests that it was forged. Therefore, Uruk 13 appears to be an attempt to copy iron arrowheads using a material that was not ideally suited for the task, which suggests that it was perhaps created in a time of stress or poverty.

All of the iron arrowheads were found in burials, while the bronze arrowheads were found in various contexts (including one burial). This is in striking contrast to other (though somewhat earlier) sites like Sialk, where the arrowheads in burials are invariably bronze. This may indicate that in the Neo-Babylonian Period, iron was considered the standard material for arrowheads, and this belief manifests itself in the grave goods interred with Babylonian individuals.

8.4.2. Nippur

Nippur has been excavated on numerous occasions, beginning with Layard in 1851, followed by the University of Pennsylvania in the last decade of the 19th Century, and then a long series of excavations under the auspices of the University of Chicago beginning in 1948.[49] Nippur is undoubtedly most famous for its prominence as a religious center in the Bronze Age, however, the early 1st Millennium settlement at Nippur did yield a small quantity of arrowheads.

The majority are of the leaf-shaped variety, with and without ribs, two of which (Nippur 2 and 5) were found in burials. A single socketed trilobate was found, however its dating is insecure, and may

[47] Van Ess & Pedde 1992, p. 37
[48] Van Ess & Pedde 1992, p. 37
[49] McCown *et al* 1967, pp. vii-viii

belong to the Achaemenid Period. Perhaps the most interesting find is a forked object, Nippur 4. Several similar examples dating to the 2nd Millennium BC were found at Nippur, indicating that these objects were used over a long span of time. They resemble simple 2-pronged forks, and indeed, may very well have been just that. However since there is the possibility that they were a form of projectile point, I have included them here (see Type 6).

8.5. Transcaucasia

8.5.1. Ayanis

Ayanis (ancient Rusahinili Eidurukai[50]) is the location of an Urartian fortress built by Rusa II. It is located on a rocky hill on the east coast of Lake Van.[51] Çılıngıroğlu & Salvini originally dated the construction of Ayanis to 655-651 BC based on dendrochronology, though they noted that the logs used for the analysis appear to have been installed during a reconstruction of the fortress after a fire rather than its initial construction.[52] More recent analysis of the dendrochronology suggests a date of roughtly twenty years earler, 677-673 BC.[53] This new data aso suggests that the original supposed date of its destruction, ca 650 BC[54], may also be roughly twenty years earlier, and it may have continued to be used for some time after that destruction.[55] Due to these uncertainties, I have dated the Ayanis arrowheads generally to the mid 7th Century BC.

By the end of 1998, 244 iron arrowheads and 150 bronze arrowheads were recovered from Ayanis.[56] However, Derın and Muscarella left 105 of the iron arrowheads out of their publication because they were significantly deformed due to corrosion.[57] Further selection criteria are not detailed, however of the remaining total, the details of 108 arrowheads were published.

As a result of the large quantity of arrowheads discovered at the site, Derın and Muscarella developed a typology to summarize them (see Figure 8.3). It should be noted that the two figures in Derın & Muscarella 2001 that provide illustrations of sample arrowheads for each type were inadvertently reversed: that on p. 190 actually depicts bronze arrowheads, and that on p. 191 the iron arrowheads.

[50] Çılıngıroğlu & Salvini 2001, p. 15
[51] Çılıngıroğlu 2001, p. 8
[52] Çılıngıroğlu & Salvini 2001, p. 17-8; see Kuniholm & Newton 2001 for a detailed discussion of the dendrochronology of Ayanis
[53] Çılıngıroğlu 2003, p. 208
[54] Muscarella 1991, p. 142
[55] Çılıngıroğlu 2003, p. 208
[56] Derın & Muscarella 2001, p. 189
[57] Derın & Muscarella 2001, p. 189

Type	Description	Example
Iron		
I	Solid	Ayanis 1
II	Leaf-shaped	
II.1	without stop	Ayanis 10
II.2	with stop	Ayanis 39
III	Others	
III.1	with stop and long tang	Ayanis 68
III.2	with long blade, barbs, and long tang	Ayanis 69
Bronze		
I	Socketed, barbed bilobates	Ayanis 72
II	Socketed, plain bilobates	Ayanis 96
III	Socketed, plain trilobates	Ayanis 107
IV	Solid blade	Ayanis 108
V	Solid tanged leaf-shape with two short barbs	Ayanis 90

Figure 8.3: Typology of arrowheads from Ayanis; after Derın & Muscarella 2001, pp. 190-191.

Most of the arrowhead types from Ayanis are well-known from other sites. Square bodkins are attested in both iron (Type I) and bronze (Type IV). Iron leaf-shaped arrowheads are common, both with stops (Type II.2) and without stops, which Derın and Muscarella refer to as "stems" (Type II.1). The other iron arrowheads were grouped together in Type III, though they seem to consist of two very different sorts of arrowheads. Type III.1 is also leaf-shaped with a fairly small blade and a relatively long stopped tang. However Type III.2 is a larger and more elaborate type of arrowhead, with a barbed blade and a pronounced stop on the very long tang. This type is duplicated in bronze (bronze Type V), where the barbs tend to have a slight outward curvature to them, and the stem widens again at another point above the stop, giving the appearance of two stops. Even more curiously, two examples have grooves where the edges of the blades should be. The iron Type III.2/bronze Type V arrowhead is attested at other Urartian sites (such as Karmir-Blur[58]).

The additional 3 types of bronze arrowheads include socketed bilobates, both with (Type I) and without (Type 2) hooks. Both of these forms are found in roughly equal quantities – there are 17 hooked bilobates, and 16 without hooks. This suggests that hooks were an optional feature, and if they had a specific use, it was a common one. Type III is rather less common, a "pyramidal" trilobate; essentially a socketed trilobate where the blades were widened to the point that they effectively turned it into a bodkin with a triangular section (see triangular trilobates, Types 3b and 3c). It is also worth noting that while considerable quantities of socketed bilobates were found, and one triangular trilobate, no conventional trilobate arrowheads were found at Ayanis. This may suggest

[58] For example, Piotrovsky 1970, pls. 54-55 and catalogue item 122

that they date to the earlier Kelermes period, like the İmirler and Amasya graves, which also contained bilobates but no trilobates.[59]

The Ayanis arrowheads were found in contexts clearly associated with the destruction of the city. Indeed, the vast majority of them – some 202 arrowheads – were found just outside the fortification walls.[60] The other major find spot was the temple-temenos area, where a further 152 arrowheads were found,[61] also associated with the destruction of the site.[62]

8.5.2. Bastam

Bastam (ancient Rusai URU.TUR)[63] was the location of an Urartian fortress excavated by the German Archaeological Institute in Tehran from 1969-1978. There is some debate over the possible existence of an earlier 9th-8th Century BC fortress at the site, however the most prominent ruins at Bastam belong to a fortress built by Rusa II in the middle of the first half of the 7th Century BC.[64]

Piotrovsky and Diakonov date the destruction of the fortress to the end of the Urartian kingdom at the beginning of the 6th Century BC. However, Kroll argued that the fortress was burned as much as 50 years earlier, in the mid to late 7th Century BC,[65] though some areas were re-inhabited shortly thereafter on an apparently smaller scale.[66] Kroll asserted that Bastam appears to have most likely been destroyed by an attack rather than an accidental fire or a voluntary abandonment on account of the destruction level containing abundant evidence of burning as well as arrowheads generally associated with "nomadic invaders."[67] However, such socketed bilobates were also found in a storage room in Karmir-Blur, suggesting that the Urartians themselves may have been making socketed bronze arrowheads, and therefore the bilobates at Bastam may have belonged to the defenders.[68]

There are a total of 23 arrowheads identified as dating to the Urartian period of the site. Of the 11 bronze arrowheads, all but one are socketed bilobates (primarily Type 2-2). Kroll stressed that all the bronze arrowheads that came from clearly identified strata (all from the vicinity of the Ostbau and Unterburg) did not belong to the buildings there were found in, but rather to the destruction level that

[59] Ivantchik 1997, pp. 25-28
[60] Derın & Muscarella 2001, p. 192
[61] The authors state, however, that "many more" cast bronze tanged arrowheads were found in this area in the 2000 dig season, at which point it was too late to include them in the publication (Derın & Muscarella 2001, p. 192)
[62] Derın & Muscarella 2001, p. 192
[63] Çılıngıroğlu & Salvini 2001, p. 19; Muscarella 1991, p. 141
[64] Kroll 1988a, p. 79
[65] Kroll 1988a, pp. 76
[66] Kroll 1988a, pp. 77
[67] Kroll 1988a, p. 80
[68] Dandamaev & Lukonin 1989, p. 226

covered them.[69] This is no doubt why nearly all the bronze arrowheads were identified by the excavators as "medisch-skythisch" (Bastam 3, 8, 10, 14, 15, 16, 22 and 23). Bastam 2, on the other hand, is identified as "urartäisch oder medisch-skythisch."[70] It is curious that Bastam 2 was considered possibly Urartian while the other socketed bilobates were not, given that the only substantive difference between them is that Bastam 2 has a hook on the socket while the others do not, and hooks are very common features on socketed bronze arrowheads. Kroll unfortunately did not explain his reasoning. Equally curious is the lack of an ethnic origin ascribed to the remaining two socketed bilobates, Bastam 18 and 19,[71] when there is no significant difference between them and the others.

The 12 iron arrowheads at Bastam are generally in a very poor state of preservation. The majority (5 examples) are Type 5b-1. The most remarkable find is Bastam 21, a flattened ribbed arrowhead with concave shoulders and a wide stop which most likely dates to the Hellenistic period (see Type 5y-3).

8.5.3. Toprakkale

Toprakkale (ancient Rusahinili Qilbanikai[72]) is the location of an Urartian fortress built by Rusa II.[73] It was destroyed around 650 BC, presumably at the same time as the other fortresses of Rusa II, and was not re-inhabited afterwards,[74] thus the arrowheads from Toprakkale have been dated to the mid 7th Century BC here. Toprakkale was subject of a number of excavations beginning in the 1870s and continuing sporadically into the 1960s.[75] This work makes use of the materials which come from the excavations of Lehmann and Belck at the end of the 19th Century, which are now housed in the Vorderasiatisches Museum, Berlin.[76] As archaeological techniques were still in their infancy at this time, there is unfortunately little information about the context of the individual finds.

Only four bronze arrowheads were found at Toprakkale by Lehmann and Belck, however large quantites are said to have been found by later Soviet expeditions.[77] Wartke suggests that they may have been associated with the attack that destroyed the fortress (comparable to the situation at other Urartian fortresses).[78] Two are socketed bilobates (Toprakkale 3 and 4) and two are socketed

[69] Kroll 1988a, p. 80; Muscarella 1991, p. 144
[70] Kroll 1979, p. 154
[71] Kroll 1988b, p. 157
[72] Çılıngıroğlu & Salvini 2001, p. 16
[73] Salvini 1995, p. 104
[74] Zimansky 2005, p. 237-238
[75] see Wartke 1990, pp. 6-8
[76] Wartke 1990, pp. 6-14
[77] Wartke 1990, p. 60, footnote 1
[78] Wartke 1990, p. 62

trilobates (Toprakkale 1 and 2). All four examples have hooks and all of them had also been sharpened after casting, as evinced by traces of filing.[79]

Wartke observed that the layout of the trilobate arrowheads, as well as the traces of flash from molding indicate that they were made with three-part molds.[80] It is certainly true that the body of the arrowhead would require three parts, however a fourth would have also been necessary: a plug to be inserted into the bottom to prevent the socket cavity from being filled with metal. The Mosul mold still has these plugs, and the Carchemish mold clearly shows how a mould with three side pieces is ideally suited for casting trilobates (though one side piece is missing from that mould) (see §6.3.3.4). Wartke however postulates a 4-part mold for the bilobate arrowheads, again based on the seams left on the surface from casting.[81] Doubtless he took the slight ridge running along the center of each face of the arrowhead as a trace of flash from casting, however this is very unlikely to be the case. A 4-part mold (5-part, including the plug for the socket) would have been needlessly complicated for a bilobate arrowhead, as a two-part mold with a socket plug would have been sufficient for the purpose. Indeed, the middle part of the Mosul mold, which casts a bilobate arrowhead, is essentially a two-part mold (plus socket plug). More significantly, the bilobates produced by the Mosul mold also have a slight longitudinal ridge running their length. A groove for this ridge was deliberately carved into the mold. It is therefore a deliberate feature rather than a result of the casting process. Its function is not clear however – it could have been aesthetic, serving to emphasize the centerline of the arrowhead, but it was perhaps more likely a guide line for the craftsman who made the mold, marking both the center line as well as the maximum depth to which he should chisel out metal to create the socket.

In contrast to the bronze arrowheads, hundreds of iron arrowheads were recovered at Toprakkale, though they were often poorly preserved.[82] As with other sites where vast quantities of arrowheads were found (such as Ayanis), Wartke elected to create a typology to summarize the finds rather than publish each arrowhead individually. Basic information (item number, dimensions, and a brief description) is provided for 87 of these arrowheads, but only 18 are drawn or have photos, and so only those 18 have been reviewed in this study.

Wartke identified ten basic arrowhead forms (though his Type A, leaf-shaped with a stopped tang, has 3 sub-varieties)[83]

[79] Wartke 1990, p. 60
[80] Wartke 1990, p. 60
[81] Wartke 1990, p. 60
[82] Wartke 1990, p. 126
[83] Wartke 1990, p. 127ff

Type	Description	Example(s)
A1	narrow leaf-shaped w/tang	Toprakkale 7
A2	wider leaf-shaped w/ridge and stopped tang	Toprakkale 5
A3	thick leaf-shaped w/stopped tang	Toprakkale 11
B	leaf shaped w/rhomboid section, ridge and tang	Toprakkale 12
C	heavy leaf-shaped w/ridge and tang	Toprakkale 14
D	bilobate with socket	Toprakkale 15
E	Unknown (badly corroded)	Toprakkale 16
F	chisel-shaped w/wide stop and tang	Toprakkale 17
G	long square bodkin w/tang	Toprakkale 18
H	square bodkin w/tang	Toprakkale 20
I	round bodkin w/tang	Toprakkale 21
K	small trilobate w/tang	Toprakkale 22

Figure 8.4: Typology of arrowheads from Toprakkale; after Wartke 1990.

Wartke's Type A are all basic leaf-shaped arrowheads with stopped tangs. They represent the bulk of the finds at Toprakkale; there are fully 407 examples of the Type A2 alone, plus an additional 375 fragments (weighing a total of approximately 3 kg).[84] One example (Bastam 6) had traces of chased decoration in the form of concentric double crosses.[85] Arrowheads of this form are rarely decorated (though similar forms, such as the long barbed arrowheads with double stops common in Transcaucasia were frequently inscribed[86]), so this is a unique discovery. Wartke also noted that some of his Type A arrowheads have shorter blades, and suggested the possibility that these were originally arrowheads of normal length that had the tip broken off, and were then re-forged into shorter arrowheads.[87] This could certainly be the case – while more metal could in theory be welded to the end of a broken arrowhead and then shaped into a new tip, it certainly would have been a far easier process to simply draw a new point out of the remaining metal. However, it is perhaps more likely the case that the shorter blades simply represent the natural variation to be found in items hand made in large quantities by many different craftsmen.

Type B differs from Type A only in the absence of a stop on the tang (Wartke referred to the stem areas as a *Zwischenzone*).[88] Only 20 of these unstopped arrowheads were found at Toprakkale,[89] which contrasts sharply with Nimrud, where unstopped leaf-shaped arrowheads comprised the vast majority of finds. The Toprakkale examples appear to be more carefully made than the Nimrud ones, however, with clear rhomboid sections rather than somewhat irregular lenticular ones.

[84] Wartke 1990, p. 127-128
[85] Wartke 1990, p. 128
[86] for an example from Karmir Blur, see Piotrovsky 1970, pl. 54-55
[87] Wartke 1990, p. 128
[88] Wartke 1990, p. 128
[89] Wartke 1990, p. 128

Several of Wartke's types are represented by a single arrowhead each, and as such they may represent natural variations on the more common forms. The sole Type C is Toprakkale 14, which is a narrow leaf-shaped arrowhead with a distinctly thick rhomboid section, nearly as thick as a bodkin (see Type 5f-1). Type D is a well-attested shape, a socketed bilobate, but Toprakkale 15 was forged from iron rather than cast in the much more usual bronze (see Type 2-2). Type E, represented solely by Toprakkale 16, a very badly corroded object which had a tang and appeared to have tapered to a point. What remains of the surface suggests that it had been nearly circular in section, rather than the gentle lentoid section commonly found in iron arrowheads. It most closely resembles the "ferrule" type objects found at Nimrud and Gerar (see Type 1a-8). Type F, with its chisel-shaped blade, is also represented by a single example, Toprakkale 17 (see Type 5e-57). Finally, Type K, represented by Toprakkale 22, in an unusual tanged iron trilobate with a tiny head (see Type 3a-16).

Wartke enumerated three different types of bodkin, types G, H and I. There are five Type G arrowheads, which are long and narrow, with a square section, rounded near the tang (see Type 1c-5). Type H, also with five examples, is similar but shorter, without the rounded portion (see Type 1c-2). Type I, with just one example, has a round section and a line engraved around its circumference just above the beginning of the tang, making the stop stand out (see Type 1a-3).

Two of the iron arrowheads from Toprakkale have been subjected to metallurgical analysis. The two arrowheads were selected from the 102 examples that fall under the museum number VA 15353, which corresponds to number 317 in Wartke.[90] None of these arrowheads were illustrated by Wartke, however he stated they are similar in form to Toprakkale 5 (Wartke's number 264), and so are presumably Type 5g-1.

8.5.4. Karchaghbyur

An Urartian cemetery dating to the 8th to 6th centuries BC in the vicinity of Lake Sevan was excavated in 1971-1972 by Mnatsakanyan of the State History Museum of Armenia.[91] Of the 28 tombs investigated, three contained arrowheads.

Tomb 23 contained 43 individuals of both sexes, as well as 3 arrowheads, which the excavators, however, dated to the Late Bronze Age. Two are bronze – one with a leaf-shaped blade and the other with a swallow-tail shaped blade, both forms which were identified as essentially Late Bronze Age by Yengibaryan, though she did acknowledge that those forms were used over a long period.[92] The third is a rare example of a bone arrowhead, which the author suggested has also parallels in LBA

[90] Wartke 1990, p. 132
[91] Yengibaryan 2002, p. 417
[92] Yengibaryan 2002, p. 420

Armenia.[93] It has a long blade, shaped like a very acute triangle, sharp shoulders, and a short and somewhat rounded tang.

Grave 27 contained two bronze arrowheads with barbs and stopped tangs.[94] Other artifacts in the tomb date it firmly to the early Iron Age.

Grave 28 contained 5 arrowheads. Four of these are types which appeared in the Late Bronze Age, but continued to be used into the 1st Millennium, and the other grave goods suggest an Iron Age date for them. Curiously, one arrowhead still possessed "remains of devices for fixing the shaft."[95] Unfortunately, no more detail is provided, and the drawing merely shows what looks like 3 rings around the top of the tang of the arrowhead. The fifth arrowhead is a badly corroded but clear example of a socketed trilobate arrowhead. The very poor preservation of the blades makes any more precise identification impossible.[96]

8.5.5. Igdyr

A cemetery for lower-class Urartians was excavated in 1913 by Petrov in the vicinity of Igdyr, on the slopes of Mt. Ararat.[97] These graves yielded 13 iron arrowheads. Eleven of these were found buried with several other iron weapons beneath the collection of cremation urns that Barnett labeled "Point 5."[98] The remaining 4 arrowheads were found with the urns and goods of the "destroyed" grave at Point 8.[99] Only 5 of the arrowheads are illustrated, and it is not clear to which point each of them belongs. However, Barnett stated that all the arrowheads are of the same type,[100] and all of those illustrated are clearly leaf-shaped arrowheads with stops (Type 5b-1).

Barnett observed that it is unusual for iron arrowheads to be deposited in Urartian graves – bronze was the usual material for such grave goods.[101] Barnett suggested that, because of the deposit of iron artifacts, the graves date from the period of Urartian expansion.[102] Indeed, all of the weapons found in the Igdyr graves – arrowheads, spear points, knives, axes and a sword - were made of iron.[103] Whether this indicates that the grave dates to the 'period of Urartian expansion' or merely rather late in the period is unfortunately impossible to tell.

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[93] Yengibaryan 2002, p. 420
[94] Yengibaryan 2002, p. 423
[95] Yengibaryan 2002, p. 423
[96] Yengibaryan 2002, pl. 16:1-5
[97] Barnett 1963, p. 153
[98] Barnett 1963, p. 157
[99] Barnett 1963, p. 159
[100] Barnett 1963, p. 186
[101] Barnett 1963, p. 186
[102] Barnett 1963, p. 186
[103] Barnett 1963, p. 186

Additionally, a considerably larger projectile point was discovered at Igdyr,[104] identified by Barnett as a javelin head,[105] which does seem probable: it is nearly three times as long as the others (far too large to be an arrowhead), yet it does not appear to have a socket, which is usual for spear heads.

8.6. Iran

8.6.1. Hasanlu

Located just to the southwest of Lake Urmia,[106] Hasanlu was investigated by a number of small expeditions beginning in the 1930s until the major excavations of the University of Pennsylvania under Dyson began in 1957, lasting until 1974.[107] Hasanlu has a long settlement history, from the Neolithic extending into the Islamic Period.[108] While Hasanlu has a long sequence of habitation, the destruction layer of Hasanlu IVB is the most significant for the present study. The destruction of Hasanlu IVB is normally attributed to the Urartians,[109] however Medvedskaya has suggested the Assyrians as the attackers.[110] Magee has flatly stated that without direct inscriptional evidence from the site, the question of who destroyed Hasanlu IVB is "unanswerable,"[111] and certainly given the available information, no identification can be made without making unwarranted assumptions.

Dyson and Muscarella have firmly asserted that the destruction of Hasanlu IVB happened in the last quarter of the 9th Century BC, and not later than 800 BC.[112] This conclusion is based in part on their assumption that the numerous Assyrian or Assyrian style artifacts could not have been deposited while the city was ruled over by the Urartians.[113] They assumed the Urartians must have conquered Hasanlu in the late 9th Century BC based on the inscriptions of the Urartian kings Išpuini and Menua,[114] and supported by the fact that in the following period of Hasanlu III, Urartian-style fortifications were built at Hasanlu.[115] The backbone of their argument is the C_{14} dates obtained from several locations, including the destruction layer on the citadel.[116] These dates, they assert, indicate that the destruction of Hasanlu IVB occurred in or near 800 BC.

[104] Barnett 1963, p. 187; fig. 37:8
[105] Barnett 1963, p. 186
[106] Marcus 1996, p. 1
[107] Muscarella 2006, p. 71
[108] Rathbun 1972, p. 3
[109] Muscarella 2006, pp. 77-78
[110] Medvedskaya 1988 & Medvedskaya 1991
[111] Magee 2008, pp. 103-104
[112] e.g. Dyson & Muscarella 1989, p. 10
[113] Dyson & Muscarella 1989, p. 3; Magee 2008, p. 93
[114] Dyson 1965, pp. 202-203; Dyson & Muscarella 1989, p. 19
[115] Dyson & Muscarella 1989, pp. 3-4
[116] Dyson & Muscarella 1989, pp. 8-12

Medvedskaya objected to the ca. 800 BC dating based on the style of various artifacts found in the destruction layer, arguing that they fit better stylistically in the 8th Century than the 9th Century BC.[117] She speculated that the completeness of the destruction of the Hasanlu IVB citadel does not fit with what Urartian policy in the area, which focused on taking control of cities to turn them into a power base rather than simply destroying and plundering them.[118] Since the Assyrians did not return to the Lake Urmia area after 714 BC (at least as far as surviving records indicate), Medvedskaya concluded that they must have achieved their objective of destroying the Urartian power base in the Lake Urmia region, and therefore Hasanlu must have been destroyed by Sargon II in 714 BC.[119] She also rejected the use of the C_{14} dates for dating the destruction, noting that for carbonized wood, the C_{14} dates relate to the when the tree was felled, not when it was burned.[120] Thus, while the structures may have been built in the late 9th Century BC, they could have been destroyed significantly later.

Dyson & Muscarella objected to Medvedskaya's analysis for several reasons. They observed that her stylistic dating of artifacts relies heavily on Assyrian reliefs and tends to neglect iconography and artifacts from other regions, such as Urartu.[121] They pointed out that if Hasanlu IVB was destroyed in 714 BC, it would have been controlled by the Urartians, yet very few Urartian style artifacts were found in the destruction layer,[122] implying that if Urartu had controlled Hasanlu IVB, there should have been a significant quantity of Urartian style artifacts. They also observed that the large Urartian-style fortifications of Hasanlu IIIB are not discussed by Medvedskaya, yet they clearly show a significant Urartian presence after Hasanlu IVB, hardly to be expected if the Assyrians had succeeded in ending Urartian control of the region contemporaneously with the destruction of Hasanlu IVB.[123] They furthermore asserted, citing Pecorella & Salvini,[124] that the nearby Urartian fortress of Qalatgah "would hardly have been built if Hasanlu IVB continued to exist."[125] Yet their principle argument remained the C_{14} dates.[126]

Magee has presented considerably more forceful arguments against a destruction date of ca. 800 BC. He observed that even if the city was under Urartian control, the presence of large amounts of Assyrian style artifacts is hardly conclusive.[127] Indeed, Dyson & Muscarella themselves neglected to take comparative evidence from other regions into account. Assyrian style artifacts have been found

[117] see Medvedskaya 1988 & Medvedskaya 1991
[118] Medvedskaya 1988, p. 11
[119] Medvedskaya 1988, p. 12
[120] Medvedskaya 1991, pp. 157-158
[121] Dyson & Muscarella 1989, pp. 17-18
[122] Dyson & Muscarella 1989, p. 19
[123] Dyson & Muscarella 1989, p. 20
[124] Pecorella & Salvini 1982, pp. 9-11
[125] Dyson & Muscarella 1989, p. 19
[126] Dyson & Muscarella 1989, pp. 4-12
[127] Magee 2008, p. 95

at sites in Urartu itself, so why not in regional areas controlled by Urartu?[128] Magee proposed that the fortress of Qalatgah, undoubtably Urartian, was built to maintain Urartian control over Hasanlu and other nearby sites, while these cities were allowed to function without much in the way of direct interference, which would account for the comparative sparsity of Urartian artifacts in Hasanlu itself.[129]

Magee's most compelling arguments, however, are in relation to the C_{14} dates. He observed that there are no samples of short-lived organic material from the citadel that are related to its destruction, and that samples used to date the destruction to ca. 800 BC come from Building III. He also asserts that the published archaeological data do not convincingly show that the destruction of the citadel and Building III come from the same event.[130] The cereals found in Building III, furthermore, may very well have been related to food production rather than the destruction event.[131] The calibrated C_{14} dates for many of these samples extend into the 8th Century BC.[132] Furthermore, one carbonized grain from the citadel, and probably linked to the destruction of Hasanlu IVB, is dated to 803-505 BC. While Magee may be overly forceful when he argues that this dating "practically excludes a date of 800 BC,"[133] it does, nevertheless, make an 8th Century date seem more probable.

It may be argued that both Dyson & Muscarella and Medvedskaya were mistaken in their attempts to link their proposed destruction dates to historical events – especially in light of the fact that the ancient name of Hasanlu has not yet been determined[134] - and this attempt to force their intepretations to fit historical texts led them to misinterpret the archaeological data. After all, we need not assume that the destruction of this site was recorded in the surviving documentary record at all, as incomplete as it is. The styles of artifacts present and the evidence of the C_{14} dates indicate that Hasanlu IVB was destroyed at some point in the 8th Century, probably after 800 BC (considering the C_{14} dates) but before Urartu lost control of the region (considering the Urartian fortress of Hasanlu III), thus ruling out the proposed dating of both Dyson & Muscarella and of Medvedskaya. For the purposes of this study, Hasanlu IVB arrowheads will be dated as 8th Century BC.

The arrowheads from Hasanlu III are less controversial in their dating. Following the destruction of Hasanlu IVB, there was a short-lived "squatter" settlement making use of the ruined remnants of the structures for some time, akin to those found at other sites following major destructions.[135] The

[128] Magee 2008, p. 97
[129] Magee 2008, pp. 94-95
[130] Magee 2008, p. 99
[131] Magee 2008, pp. 99-100
[132] Magee 2008, pp. 100-101
[133] sample P865; Magee 2008, p. 101
[134] Salvini has suggested that Hasanlu may have been the Mešta mentioned in Urartian inscriptions, however this is not generally accepted; Pecorella & Salvini 1982, pp. 10-11 & Magee 2008, p. 97. Reade has also proposed that it is Gilzānu; see Reade 1979c.
[135] Dyson 1965, p. 203; Dyson & Muscarella 1989, p. 20

subsequent Hasanlu III level is split into several sub-levels. Hasanlu IIIC relates to the Urartian fortifications, and structures from Hasanlu IIIB (which is also considered "Urartian" in date) abut those walls.[136] There is a long period of apparent abandonment between Hasanlu IIIB and IIIA.[137] Only Hasanlu IIIB is relevant to this study, as Hasanlu IIIA dates to the late Achaemenid Period.[138] It is therefore unfortunate that the published arrowheads from this period are listed merely as Hasanlu III rather than one of the three sub-levels,[139] thus those arrowheads must be dated from the 8th Century through the 4th Century BC.

The arrowheads found in the the Hasanlu IVB destruction layer were published by Thornton & Pigott, as were a small number of arrowheads from Hasanlu III. They made a typology of arrowheads based on that which Derın & Muscarella created for the arrowheads from Ayanis,[140] and published 92 examples, however they did not publish the entire corpus of 681 arrowheads (see Figure 8.5).[141] They defined arrowheads as blades "having a blade length shorter than 8-9 cm and either a solid tang or a socket of less than 1 cm in diameter."[142]

While the types established by Thornton & Pigott include arrowheads of iron, bronze, bone and stone, they are illustrated only by iron arrowheads. Bronze, bone and stone arrowheads each have their own figure illustrating a number of examples with no reference to their types, which may cause some confusion.[143] Thornton & Pigott stated that they did not use material as a distinguishing feature because iron had only been recently introduced into the region and distinct forms for specific materials had not yet developed.[144]

The shoulders are simplified to three categories: angular, round or barbed. Thus square shoulders, for example, must be included with angular shoulders. Furthermore, sections are not classified typologically, so that ribbed and rhomboid arrowheads are lumped together with lenticular ones. This oversight is rather surprising, given that sections were classified for spear heads.[145] Likewise, stopped and unstopped arrowheads are not typologically differentiated.

[136] Kroll 2013, p. 184
[137] Kroll 2013, pp. 190-191
[138] Kroll 2013, p. 190 & Muscarella 2006, p. 88
[139] Thornton & Pigott 2011, p. 168, fig. 6.31
[140] Thornton & Pigott 2011, p. 139
[141] Thornton & Pigott 2011, p 137
[142] Thornton & Pigott 2011, p. 138
[143] Thornton & Pgiott 2011, pp. 145-146
[144] Thornton & Pigott 2011, p. 139
[145] Thornton & Pigott 2011, p. 147, fig. 6.9

Type	Description	Example
I	non-barbed/non-winged flat (uniplanar) blades	
IA	angular shoulders	Hasanlu 1
IB	round shoulders	Hasanlu 18
IB1	special 1	Hasanlu 55
IB2	special 2	Hasanlu 56
IC	socketed haft	Hasanlu 35
II	barbed/winged flat (uniplanar) blades	
IIA	single set of barbs	
IIA1	blade tapers straight from shoulder to point	Hasanlu 40
IIA2	second rounded shoulder at mid-blade (waisted)	Hasanlu 43
IIB	more than one set of barbs	
IIB1	all barbs in single plane	Hasanlu 44
IIB2	second set of barbs set perpendicular to the plane of blade (diplanar)	Hasanlu 47
III	non-barbed/non-winged solid blades (bolts)	
IIIA	circular cross-section	Hasanlu 77
IIIB	rectangular or square cross-section	Hasanlu 81

Figure 8.5: Typology of Hasanlu IVB arrowheads; after Thornton & Pigott 2011, p. 136.

The arrowheads from Hasanlu IVB are noteworthy in several respects. Some parallels to unusual forms attested at Marlik were found in Hasanlu IVB, such as the double headed arrowheads (Type 7).[146] These similar forms do not necessarily argue that the same ethnic group that inhabited Marlik also inhabited Hasanlu –borrowings of arrowhead and other weapons types were very common,[147] though clearly there was some form of contact or influence. The bone arrowheads of Hasanlu are also noteworthy both for their quantity and for their variety.[148] Bone arrowheads at other sites tend to be simple triangular or leaf-shaped obects, but the Hasanlu bone arrowheads exhibit a wide range of forms, including barbed arrowheads.

The most remarkable of the Hasanlu arrowheads, however, are the socketed iron bilobates. Their existence helps to fill a gap in the development and spread of socketed arrowheads from the north. The curious choice of iron for a socketed arrowhead is paralleled only by one other find from the early 1st Millennium BC, Toprakkale 15. All other socketed arrowheads from this period are cast in bronze, doubtless because of the comparative ease of forming a socket by casting rather than forging.

8.6.2. Marlik

Marlik is located in the valley of a tributary to the Sefid River, not far from the Caspian Sea.[149] It was excavated from 1961-1962 by Negahban,[150] who unearthed a cemetery that was used from the latter half of the 2nd Millennium to the 7th Century BC (some of the tombs being reused over a span of

[146] see Thornton & Pigott 2011, p. 147, fig. 6.8
[147] e.g. Urartians using Assyrian-style conical helmets; Barron 2010, pp. 188-189
[148] Thornton & Pigott 2011, p. 146, fig. 6.7
[149] Negahban 1996, pp. 1-3
[150] Negahban 1996, pp. 5-10

centuries).[151] Due to the richness of the tombs, which had remained unplundered, Negahban labeled it the "Royal Cemetery," though it is not known who built it, nor where they lived, as no other architecture was found at Marlik.[152]

Over 1000 arrowheads were found at Marlik, and with the exception of a few examples of bone or flint arrowheads, all were of cast bronze.[153] Due to the wide time span that the tombs cover, as well as their periodic reuse, the dating of the finds from within them is anything but precise.

Nevertheless, the fact that all the artifacts were found in tombs indicates that they represent what was thought of as suitable for grave goods (for reasonably wealthy graves), and do not necessarily reflect accurately what was used in practical situations. Certainly, Negahban's Type I was not a practical weapon, and indeed, may not have been intended as a weapon of any kind, despite the close resemblance of the tip to an arrowhead.

Because of the vast quantity of arrowheads found, Negahban created a typology (with 41 actual examples illustrated) in order to publish examples representing each type of arrowhead according to his typology (see Figure 8.6). Unfortunately, this approach does not allow one to examine the bulk of the arrowheads to determine how well they fit his categories. The weapons and armor from Marlik were published separately a year before, but using different item numbers.[154]

All the arrowheads upon which this typology is based are bronze, with the exception of the last two types. Those are listed separately primarily because of the material they are made of rather than their actual form.

Nagahban's typology is based on the blade shape and shoulders of the arrowheads, neglecting the sections and stops, which is curious, as the Marlik arrowheads show considerable variation in both stops and sections. Of the 34 Type 5 arrowheads, 16 are unstopped and 18 have stopped tangs. The majority - 20 examples - have ribbed sections, yet there are also 10 rhomboid, 3 lenticular and 1 flattened rib examples. Furthermore, all variations of the swallowtail shoulder are grouped together under the category "jetlike wings." Because of this, Nagahban's types are somewhat more general than those put forth here. Furthermore, Negahban uses relative size as a typological characteristic. Thus his Type Va and Vc are identical except for size, as are Vb and Vd. There is indeed a gap in sizes between the examples found at Marlik of these two pairs of types. Va has 3.0 to 4.6 cm blades

[151] Löw 1995-1996, p. 119
[152] Negahban 1996, p. 13
[153] Negahban 1996, p. 275
[154] Negahban 1995

and Vb 2.6 to 3.8 cm, while Vc has 4.8 to 10.9 and Vd 10.6 to 16.8. It should be noted, however, that the Va/Vc pair has only a gap of 0.2 cm between them, suggesting that this dividing point is highly arbitrary. After all, the largest Vc (Marlik 18) has a blade nearly 5 cm longer than the next largest Vc.

Type	Description	Example
I	decorative arrowheads or arrows	Marlik 2
II	arrowheads with double points	Marlik 3
III	elongated pyramidal arrowheads	Marlik 4
IV	arrowheads with jetlike wings	Marlik 5
V	triangular arrowheads with rounded or angular midribs	
- Va	- small triangular arrowheads with barbed shoulders	Marlik 9
- Vb	- small triangular arrowheads with rounded shoulders	Marlik 13
- Vc	- larger triangular arrowheads with barbed shoulders	Marlik 17
- Vd	- larger arrowheads with lanceolate heads and rounded shoulders	Marlik 23
VI	trilobate arrowheads	Marlik 25
VII	barbed deltoid arrowheads	Marlik 28
VIII	simple ovate arrowheads	Marlik 33
IX	double-winged arrowhead	Marlik 41
X	bone arrowheads	Marlik 42
XI	stone and flint arrowheads	-

Figure 8.6: Typology of Marlik arrowheads; after Negahban 1996.

In any event, size cannot be a typological characteristic for a universal typology, such as the one proposed in this work. A universal typology is not restricted to a single group of samples, and must be able to accommodate new finds. While certainly javelin-heads may be mixed in with arrowheads, dividing them by size necessarily requires the arbitrary choice of a size at which anything larger is not an arrowhead, and this may mask the actual size distribution as would be evident if all points with similar characteristics are looked at together. For this reason, the typology presented here does not categorize based on size, but allows each individual type to be analyzed for differences in size.

8.6.3. Nush-i Jan

Nush-i Jan, located some 60 km south of Hamadan, was excavated in the 1960s and 70s by David Stronach.[155] The site is often considered to have been settled by the Medes,[156] and was in use from approximately 700-550 BC (which a further 50 years or so of "squatter" settlement afterwards).[157]

[155] Curtis 2005, p. 233
[156] Curtis 2005, p. 233
[157] Curtis 2005, p. 244

Curtis expressed his surprise at finding four bronze leaf-shaped arrowheads (Nush-i Jan 7-10[158]) in this Iron Age III context, since by then iron had nearly entirely replaced bronze for leaf-shaped arrowheads.[159] Indeed, there are very few bronze Type 5 arrowheads than can be shown conclusively to date to after ca. 700 from the sites surveyed here: Ayanis 88, 89 and 90 (mid 7th C. BC) and Carchemish 38 and 39 (late 7th-early 6th Century BC). That four (or five) would be found at Nush-i Jan alone, and furthermore, make up such a large percentage of those found there (one third of the whole) does seem quite remarkable. Iron does not appear to have been scarce at Nush-i Jan, since the five tools found at Nush-i Jan were all iron.[160] It is noteworthy, however, that three of these arrowheads – Nush-i Jan 7, 9 and 10 – appear to have been forged rather than cast. A plausible explanation for the prevalence of forged bronze arrowheads is that at some point in time, the settlement at Nush-i Jan lacked the skilled craftsmen necessary to make arrowhead molds, so bronze arrowheads had to be fashioned by smiths who were more used to working with iron. At least one arrowhead at Nush-i Jan (Nush-i Jan 8) was indeed cast, however, so either Nush-i Jan did possess mold-makers at some point in its history, or Nush-i Jan 8 was manufactured elsewhere.

8.6.4. Sialk

Sialk, located near Kashan in Iran, was an Elamite city inhabited from the Early Bronze Age until well into the Iron Age. Cemetery B, excavated in the 1930s by Ghirshman, dates to the 9th or 8th to the 7th Century BC.[161]

The precise identification of arrowhead forms from Sialk is complicated due to the general lack of drawings of sections. Furthermore, while a selection of arrowheads were illustrated with fairly detailed drawings,[162] the majority of those published have only minimal sketches at a very small scale, so one cannot always assume that all pertinent detail is visible. In addition, only some examples of groups of arrowheads were published.[163]

All of the arrowheads that were excavated from tombs were tanged and the majority of examples were bronze. Precise figures are not, unfortunately, available, however Ghirshman illustrates the point by commenting that in one rich tomb (Tomb 15), of the 42 arrowheads found, only 6 were iron and the rest were bronze.[164] The shafts of the arrows were reed, traces of the fibers of which were often

[158] Curtis classified Nush-i Jan 11 as a "lancehead" based on its size though it falls under Type 5a-1 in this typology.
[159] Curtis 1984, p. 28
[160] Curtis 1984, p. 26
[161] Muscarella 1995, p. 994
[162] Ghirshman 1939, pl. 92
[163] for example, only 6 of the 36 from Tomb 15 were published; Ghirshman 1939, p. 233 & pl. 57
[164] Ghirshman 1939, p. 49

identifiable in the corroded metal of the tangs.[165] The arrowheads were often found in tightly clustered groups near the right shoulder of the individual buried in the tomb, suggesting that they were perhaps in a quiver that was either placed next to the individual or even hung on his body as it would have been worn in life.[166]

Perhaps most remarkable are the considerable quantities of bronze leaf-shaped arrowheads. Such arrowheads were very common in the 2nd Millennium BC, however by the time of Sialk Cemetery B, they had been almost completely replaced by iron. Iron examples do indeed appear at Sialk, however they are outnumbered by bronze examples (at least amongst those specified in the publication). It should be noted, however, that the vagueness of the drawings of the arrowheads makes it impossible in most cases to say with any certainty what kind of section they had; lenticular, rhomboid and flattened rhomboid are all attested at Sialk. Nor is there any way to determine whether or not the arrowheads were cast or forged.

Sialk also produced many bodkins, with both circular and square sections. Most interesting are those with globular stops, which are rounded and often have a slightly wider section than the blade itself. Among the sites surveyed, they appear only at Sialk.

Two points, both with delta-shaped blades, a thick rib and broad stop on the tang are of considerable interest. Two comparable examples come from Assur (though of uncertain date). Their heavy construction and thick tangs suggest they may have been for javelins rather than arrows.

Socketed trilobates were found the in the area of Cemetery B, however Ghirshman observed that these finds did not, in fact, come from tombs, and likely post-date the cemetery.[167] None of the excavated tombs produced any socketed bronze arrowheads, trilobate or bilobate.[168]

8.7. Syria

8.7.1. Sultantepe

Sultantepe is located roughly 24 km northwest of Harran.[169] The population appears to have been largely Aramaean, as indicated by the preponderance of Aramaic names on tablets from the site.[170] It was most likely absorbed into the Assyrian Empire around the same time as Harran (probably during

[165] Ghirshman 1939, p. 46
[166] Ghirshman 1939, p. 46
[167] Ghirshman 1939, p. 47
[168] Ghirshman 1939, p. 46
[169] Lloyd & Gokçe 1953, p. 41
[170] Finkelstein 1957, p. 138.

the reign of Shalmaneser III[171]). Excavations of the Neo-Assyrian levels at Sultantepe were limited by the very considerable (7 meter thick) layers from later periods,[172] however remnants of large public buildings,[173] considerable quantities of Assyrian-style pottery[174] and a sizeable cache of Assyrian tablets,[175] indicate that Sultantepe had become a significant provincial Assyrian city. A similar pattern of "Assyrianization" has been found at other provincial Assyrian cities, such as the more extensively excavated Tell Ta'yinat (ancient Kunula, capital of the Neo-Hittite kingdom of Patina or Unqi until its conquest by Assyria).[176] The Neo-Assyrian occupation of the acropolis ends with a destruction layer, followed by an apparent hiatus in settlement until the Hellenistic period.[177]

Lloyd and Gokçe speculate that this destruction of Sultantepe must have taken place at roughly the same time as the historically-attested destruction of nearby Harran in 610 BC,[178] though some burials appear to date to "immediately" after the destruction.[179] The lack of any specific mention of Sultantepe in historical accounts – indeed, the ancient name of Sultantepe is as yet unknown[180] – means that a firm or even probable association with the historicaly-attested destruction of Harran cannot be made. The discovery of a tablet containing the name of a non-canonical limmu[181] indicates that Sultantepe was still inhabited after 649 BC (the last year recorded in preserved limmu lists[182]).

While the dating of the artifacts in the destruction level do appear to correspond to a late Neo-Assyrian date (supported by a tablet mentioning a post-canonical limmu, thus written after 648 BC), and it seems reasonable to assume that the Assyrian city at Sultantepe would have been destroyed around the same time as Harran, there is only a **possible association** with the historical event.

There are 5 published arrowheads from the excavations by Seton Lloyd of the British Institute at Ankara in the 1950s. Perhaps the most significant of the Sultantepe arrowheads are the tanged iron trilobates, Sultantepe 3 and 5.[183] These are quite rare in the period covered by this work, though they

[171] Postgate 1972-1975, p. 123 (Ḫarrān)
[172] Lloyd & Gokçe 1953, p. 28
[173] Lloyd & Gokçe 1953, pp. 28 & 32-42
[174] Lloyd & Gokçe 1953, pp. 33 & 36; Lloyd 1954, pp. 107-108
[175] The tablets may have belonged to an individual with the Assyrian name Qurdi-Nergal, frequently mentioned in the colophons of the tablets; Lloyd & Gokçe 1953, p. 36.
[176] Harrison & Osborne 2012, pp. 125-126; Harrison 2009, p. 171
[177] Lloyd & Gokçe 1953, p. 28
[178] Lloyd & Gokçe 1953, p. 41; for the destruction of Harran mentioned in the Babylonian Chronicle, see Wiseman 1956, pp. 18-19.
[179] Lloyd 1954, p. 107
[180] The name Huzirina appears on some Sultantepe tablets, but Gurney has shown Sultantepe could not be the Huzirina known from other texts as it is far too far west; Gurney 1952, p. 31.
[181] Lloyd & Gokçe 1953, p. 31
[182] Millard 1994, p. 54
[183] Lloyd 1954, figs. 6:4 and 6:6

appear in considerable numbers in the Achaemenid Period.[184] The larger of the two, Sultantepe 3, was found in Burial 3, "immediately post-dating the destruction" of the site at the end of the Neo-Assyrian Period.[185] The burial clearly post-dates the destruction of the acropolis of Sultantepe, as it intrudes on the remnants of its architecture, and Lloyd assigns it to the "time of the Scythians,"[186] however the paucity of finds within the tomb make it impossible to assign a date with any precision. Similar "Scythian" burials have been found at Deve Hüyük Cemetery 2,[187] which dates to the Achaemenid Period, so unfortunately, "immediately" after the destruction here could mean up to a couple centuries after. The similarity of the tanged trilobate found in Burial 3 with those at Persepolis argue for a somewhat later date.

The other two trilobates, Sultantepe 4 and 5, were both found in the destruction level of the acropolis, and so they more likely than not date to the end of the Neo-Assyrian Period.[188] Sultantepe 5 is the other tanged trilobate, which is shorter and has a more triangular profile than the potentially significantly later Sultantepe 3. Sultantepe 4 is identified by Lloyd as a tanged trilobate as well,[189] however it almost certainly has a socket instead of a tang. The artifact was perhaps so corroded, or insufficiently cleaned, that the socket appeared solid, leading to the misidentification. Unlike the other tanged trilobates, it is made of bronze, not iron. Furthermore, if it did have a tang, it would have had to have a wide stop, and tang broken off flush with the surface. Such a wide stop would be unprecedented among tanged trilobates.

8.7.2. Tell Knēdiğ

Located on the Habur some 20 km south of Al-Hasakah,[190] Tell Knēdiğ was absorbed by the Neo-Assyrian Empire by the end of the reign of Assurnasirpal II and subsequently remained in Assyrian control until the end of the empire.[191] Like Sultantepe, the population of Tell Knēdiğ appears to have been to a greater or lesser extent Aramaic due to the number of Aramaic names scratched into or painted on clay tablets.[192] The site was excavated in the 1990s by the Vorderasiatisches Museum Berlin.[193] The arrowheads in the final publication were handled by Lutz Martin.[194]

[184] for example, in the Treasurey at Persepolis, see Schmidt, E.F. 1957, pl. 76:15-16
[185] Lloyd 1954, p. 107
[186] Lloyd & Gokçe 1953, p. 36 and p. 46
[187] See Moorey 1980
[188] Lloyd 1954, p. 107
[189] Lloyd 1954, p. 107
[190] Klengel-Brandt *et al* 2005, p. 2
[191] Klengel-Brandt *et al* 2005, p. 8
[192] Klengel-Brandt *et al* 2005, p. 8
[193] Klengel-Brandt *et al* 2005, p. 1
[194] Klengel-Brandt *et al* 2005, p. 305

A total of 15 arrowheads from the Neo-Assyrian Period were found at Tell Knēdiğ.[195] All are iron, and all but two of them were found in burials (all of which were of men or men and women together).[196] They are all in a very poor state of preservation.

The arrowheads fall into two distinct categories for the most part, closely tied to their find location. Ten are fairly conventional Type 5b-1 leaf-shaped arrowheads with stopped tangs, and all but one of them come from a single burial, Grave 59. A different burial, Grave 98, contained three Type 5b-37 extended ogees and no other kind of arrowhead. The two remaining arrowheads are a badly damaged Type 5 and a broken bodkin (perhaps Type 1a-1). The segregation of the Type 5b-1s and 5b-37s in separate burials suggests that the two types were not commonly used in conjunction with one another, and that they may have served different functions. It is perhaps more likely, for example, that the extended ogees were intended for hunting arrows while the Type 5b-1s were general purpose or even specifically for combat.

8.7.3. Carchemish

Carchemish, located on the Euphrates at the modern Syrian-Turkish border, was one of the most important cities in northern Syria in the early 1st Millennium BC.[197] Destruction layers from the early 1st Millennium BC are generally assigned to one of two postulated destructions of the city which are derived from historical sources. The first was carried out by Sargon II in 717 BC[198] and the second by Nebuchadnezzar in 605 BC.[199]

While Woolley considered that the destruction of the West Gate of Carchemish was too late to assign to the attack of Nebuchadnezzar II (and thus far too late for Sargon II),[200] he was confident in assigning the destruction of House D to it.[201] The two primary sources for this event are the Babylonian Chronicle and the Book of Jeremiah. The Babylonian Chonicle, however, states that Nebuchadnezzar went against the Egyptians who were in Carchemish, but that they withdrew before him and he defeated them.[202] Presumably, this means the defeat of the Egyptian forces took place outside of Carchemish, and thus the fate of the city itself is not specified. This passage is somewhat broken, so a more explicit mention of the destruction of Carchemish could be missing in a lacuna, but it also may have never been there in the first place.

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[195] Klengel-Brandt *et al* 2005, pp. 305-306 and pls. 201-202
[196] Klengel-Brandt *et al* 2005, p. 305
[197] Winter 1983, p. 177
[198] Winter 1983, p. 179
[199] Niemeier 2001, p. 20; Woolley dates this event to 604 BC, however I have followed Niemeier's dating for Nebuchadnezzar's attack as it also agrees with Hawkins 1976-1980, p. 446.
[200] Woolley 1921, p. 125
[201] Woolley 1921, p. 79
[202] Wiseman 1956, p. 67

The Jeremiah 46:2 is equally vague, stating that the army of Egypt that was in Carchemish was attacked by Nebuchadnezzar. While one could plausibly take this to mean that the Babylonians attacked Carchemish with the Egyptians inside it, its wording could also allow the implication of the Babylonian Chronicle that the Egyptian army which had been in Carchemish withdrew from the city before it was defeated, thus leaving open the possibility that Nebuchadnezzar did not destroy Carchemish at all.

Thus, the two primary sources taken as proof that Nebuchadnezzar destroyed Carchemish do not specifically state that he did so. It is perhaps reasonable to infer that he did at least take and loot Carchemish, but since it is not actually stated, this conclusion should not be taken as certain. Because there is also no major change in settlement patterns after either of these destructions, they have only a **possible association** with either of these historical events.

There were two primary find spots of arrowheads at Carchemish. Six arrowheads were found in the ruin of the West Gate.[203] Two were bronze, but the remaining 4 were iron, suggesting an early 1st Millennium BC date. The West Gate had been destroyed during an attack, and rather than rebuild it, the residents of Carchemish hastily plugged the gate with a roughly-built wall of mud brick set directly on the rubble of the gate rather than on a proper foundation.[204]

Because a burial containing a Late Hittite seal was discovered in the ruins of the outer gate tower, Woolley concludes that the destruction could not date to that inflicted by Nebuchadnezzar, as the Late Hittite period "ended abruptly with Nebuchadnezzar's victory."[205] He also rejects dating it to the destruction by Sargon II, as other damaged areas of the city were rebuilt under Sargon's rule with bricks stamped with his name, however none were found at the West Gate.[206] An earlier date is also rejected, as it is unlikely that Carchemish would have allowed this critical point in their defenses to remain in such a poor state.[207] Indeed, this argument could also be applied to the destruction by Sargon II – afterwards, there would have been ample time to properly rebuild the gate.

Woolley perhaps read too much into the Late Hittite grave in the ruins of the gate tower. There was no indication how long after the destruction of the gate that the interment was made, and could have conceivably been immediately after. Excavations at Khorsabad have shown that immediately after

[203] Woolley 1921, p. 81
[204] Woolley 1921, p. 78-79
[205] Woolley 1921, p. 79
[206] Woolley 1921, p. 79
[207] Woolley 1921, p. 79

the destruction of that city, Assyrians continued to live there for some time in "squatter" settlements.[208]

The artifacts in the gate correspond fairly well with the purported destruction by Nebuchadnezzar, but since a firm association cannot be made, dating of the West Gate must be based on the objects found there. The Greek greave found in the West Gate[209] is of a type that was in use from ca. 630-550 BC,[210] thus the arrowheads from the West Gate can be assigned to the late 7th to early 6th Century BC.

The bulk of the arrowheads found at Carchemish come from House D, where the dating situation is somewhat less ambiguous. House D was built in the Late Hittite period, consisted of only one phase of construction, and was destroyed by fire and never cleared out or reoccupied.[211] Arrowheads, "literally in hundreds," were discovered there, often in doorways.[212] Many were found bent or broken, as if they had struck hard surfaces, and occasionally a mass would be found corroded together, as if they had been in a quiver which had since decomposed.[213] This would suggest that either House D was the site of very intense combat, or that shortly after the destruction, survivors had possibly gathered potentially salvageable equipment in the burned-out remains of the house, but then for unknown reasons abandoned it (though it is more likely that the arrows were in place in the house before it burned, and the fire destroyed the arrow shafts, making finding the salvageable arrowheads amongst all the ash and debris a very difficult task).

Woolley argued that the date of the destruction of House D can be tied to the Babylonian attack of 605 BC. He observed that such a large and prominent house as House D could scarcely expected to have been left a burned-out husk for 100 years had it been destroyed in the time of Sargon II.[214] Furthermore, a bronze ring with a cartouche of Psamtik I was found in the house, clearly showing that the attack by Sargon II was certainly too early.[215] While, as stated above, the association with the purported destruction by Nebuchadnezzar is only possible, this and other artifacts provide a rough date for the House D artifacts. A Greek shield found in House D was of a type used in the late 7th Century BC,[216] which agrees well with the Psamtik I ring. Thus, the arrowheads found in House D can be assigned to the late 7th Century BC.

[208] Loud 1935, pp. 85-86
[209] Woolley 1921, p. 81 & pl. 25a
[210] Niemeier 2001, p. 19
[211] Woolley 1921, p. 125
[212] Woolley 1921, p. 125
[213] Woolley 1921, p. 125
[214] Woolley 1921, p. 125
[215] Woolley 1921, p. 126
[216] Niemeier 2001, p. 19-20

A considerable variety of arrowheads were found in House D. Some are quite well-attested in the later Neo-Assyrian and Neo-Babylonian Period. The socketed bronze arrowheads, for the most part, are of well-attested forms that accord well with a late 7th Century BC date. The bronze quadrilobate arrowheads, however, are unique (see Type 4). Unlike trilobates, these were equipped with stopped tangs rather than sockets.

The barbed socketed trilobates are also unique to Carchemish. Socketed trilobates were very common in the late 7th Century BC, however they were almost never barbed (though hooks were common enough). Those trilobates that were barbed typically had tangs rather than sockets. Socketed trilobates with barbs do appear more commonly in later periods, but they do not have the long sockets of the Carchemish examples – indeed, their sockets are usually not at all evident, completely encased within the blades.[217]

Also of particular interest for the study of arrowheads is that Carchemish produced one of the two known bronze molds for socketed trilobates, and the only one found during a controlled excavation. This may suggest that socketed bronze arrowheads were manufactured locally at Carchemish in the late 7th Century BC, though as it is a small, portable object, it could also have been dropped by an invader during or after the storming of the city.

8.7.4. Tell el-Fakhariya

Located just south of Ras al-ʻAyn, Syria, Tell el-Fakhariya is at the headwaters of the Ḫabur River.[218] It has been tentatively identified with the 2nd Millennium BC Waššukanni, capital of Mitanni,[219] and its identity in the early 1st Millennium is nearly certain. A statue of the Aramaic king Hadysʿy consecrated to Hadad of Sikan strongly suggests that the site was the location of the Neo-Assyrian city Sikan.[220]

The American soundings at Fakhariya in 1940 produced 15 arrowheads from the early 1st Millennium BC, 12 of which came from a single grave, Burial III.[221] The burial is dated by McEwan *et al* to the Neo-Assyrian Period by a ceramic goblet.[222] However, the arrowheads themselves do not appear to fit in a Neo-Assyrian context, a disparity hightened by the fact that all the Fakhariya arrowheads are made of bronze even though iron was more commonly used for leaf-shaped arrowheads of all sorts during the early 1st Millennium BC. Ogee arrowheads are well-attested in the late 2nd Millennium

[217] for an example from Persepolis, see Schmidt, E.F. 1957, pl. 76:12
[218] Assaf 1997, p. 300
[219] McEwan *et al* 1957, p. v
[220] Assaf 1997, p. 300
[221] McEwan *et al* 1957, p. 46
[222] McEwan *et al* 1957, p. 35

BC,[223] however among the 1st Millennium BC sites surveyed in this work, every single ogee arrowhead comes from Fakhariya with the exception of Lachish 8 (Type 5a-30), the ogoid appearance of which may simply be the result of corrosion. If ogee arrowheads properly belong to the 2nd Millennium BC rather than the 1st, three possibilities are suggested: the burial is actually earlier than the Neo-Assyrian Period and the Assyrian goblet is a later intrustion, the burial was made at an earlier date and then re-used in the Neo-Assyrian Period, or the burial was indeed Neo-Assyrian and the arrowheads were already antiquated by the time they were placed in the grave. Unfortunately, the other contents of the grave are not useful for making a clearer distinction. Therefore, the Fakhariya ogees must be regarded as most likely misidentified 2nd Millennium BC arrowheads (a period during which Fakhariya appears to have been particularly prominent[224]), yet the possibility that bronze ogee arrowheads were still being used at Fakhariya in the early 1st Millennium BC must be left open until more conclusive evidence is found.

The three arrowheads recovered from the Iron Age Palace do not have any specific dating. McEwan acknowledges that not all of the objects found among the 3 floors of the palace were "contemporary with the building,"[225] therefore their date is also open to question. It is nevertheless worth noting that while all three are bronze, none are ogee arrowheads.

In preparing the measurements and illustrations for this work, a disparity became evident between the drawings and photographs. The drawings on plate 52 are not precisely to scale with the photographs on plates 45 and 49, when the listed scale is taken into account. Because all of the arrowheads have photographs and not all have drawings, I have elected to use the scale of the photographs, and have slightly enlarged the drawings to match them.

8.8. The Levant

8.8.1. Lachish

Lachish was a Judean city, located roughly halfway between Jerusalem and Gaza, on Wadi Ghafr.[226] It was excavated in the 1930s by a British expedition led by James Starkey, and again from the 1970s through the 1990s by Tel Aviv University.[227] Arrowheads from the British expedition were published by Tufnell in 1953, and those from the Tel Aviv University excavations were published by Rothenberg in 1975 and more thoroughly by Gottlieb in 2004. Both the Tufnell and Gottlieb publications presented some issues. The drawings in Tuffnell are lacking in detail, yet more

[223] For example, at el-Khadr (see Cross & Milik 1956, p. 17) .
[224] Assaf 1997, p. 300
[225] McEwan *et al* 1957, p. 49
[226] Tufnell 1953, p. 34
[227] Ussishkin 1997, p. 317

problematic is that groups of arrowheads would only have one example published, resulting in a much smaller sample than a full publication would have allowed. The database or spreadsheet used for Gottlieb's publication of arrowheads seems to have suffered from a glitch that resulted in an extraneous zero being inserted after the decimal point for arrowhead lengths. Checking the lengths given against the drawings provided indicated that simply removing the zero (and letting the digit in the hundredths place move forward to the tenths place) resulted in the correct value. However, even with that correction, there were still a number of arrowheads that had lengths listed that differed from the actual size of the image (often smaller, thus could be the result of metal flaking off during storage or handling between the time they were photographed and drawn and the time they were measured). In these cases, I altered the length to that derived from measuring the image itself since then it would remain proportional to the width and blade length measurements that I made. A number of arrowheads from Tufnell's publication were re-published by Gottlieb (as well as some previously unpublished arrowheads from the British excavations), and there were again some variations in lengths given in the two publications. In these cases, I have used Gottlieb's measurements and images, since the images, at least, are far more detailed.

There are three major destruction levels at Lachish. One dates to the end of the 2nd Millennium, ca. 1200 BC, and the two later destruction layers are associated with historical events by Tufnell: one associated with the destruction of the city by Sennacherib around 700 BC (and famously depicted on his reliefs,[228] see Figure 8.7), and the other with that inflicted by the Babylonians around 586 BC.[229] Tufnell, however, does not attempt to date objects found in the destruction levels to the specific date of the purported historical event, but rather to a general period that ends at the approximate date of the historical event. Thus, the levels at Lachish which are relevant to this work are Level V (ca. 1000-900 BC), Level IV (ca. 900-800 BC), Level III (ca. 800-700, ending with the destruction attributed to Sennacherib) and Level II (ca. 700-597, ending with the destruction attributed to Nebuchadnezzar).[230]

Lachish does appear to have been at least partly deserted after the destruction that ended Level II, with nothing else above it that can be securely dated to the later 6th Century BC,[231] so a firm association could be possible. However, Lachish clealy suffered multiple attacks during the period of Level II. Tufnell mentions that a gate shows signs of burning on two distinct occasions, and attributes them to two different attacks by Nebuchadnezzar.[232] Furthermore, Tufnell also mentions that while evidence of destruction is very common within the walls of Lachish, it cannot be certain that all of the destruction occurred at the time the city fell to the Babylonians. At Jerusalem, for example,

[228] e.g. Hall 1928, pl. 34
[229] Tufnell 1953, pp. 51-58
[230] Tufnell 1953, p. 50
[231] Tufnell 1953, p. 58
[232] Tufnell 1953, p. 57

Babylonian soldiers destroyed parts of the city a month after its capture.[233] Because of the uncertainty of that these issues raise, it cannot be assumed that all evidence of destruction from the end of Level II relate directly to the Babylonian attack of 597 BC. Thus, I have altered the end date for Level II to a general 600 BC and refrained from giving specific dates to the arrowheads from that destruction, since its association with the destruction of 597 BC is only **probable**, not firm.

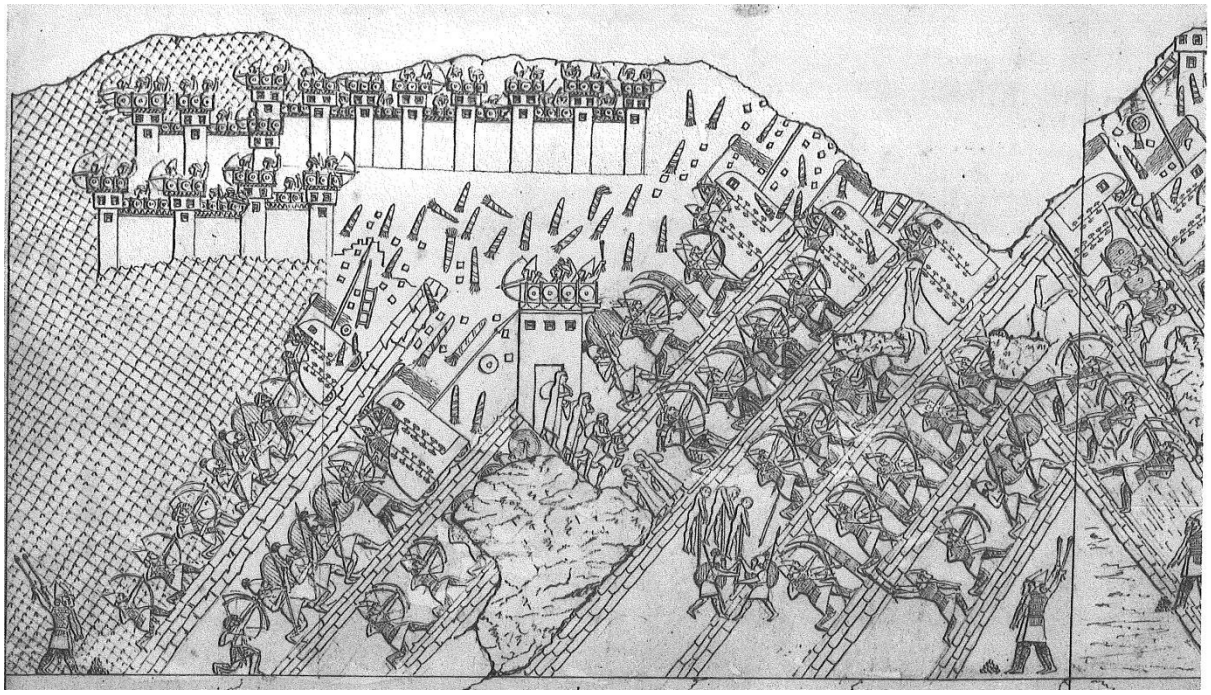

Figure 8.7: Sennacherib's attack on Lachish as depicted in the Southwest Palace; after Barnett, Bleibtreu & Turner 1998, pl. 330.

Hundreds of arrowheads were found at Lachish, most of which appear to be associated with destruction levels of the city, often being found with burnt debris and often with the tips bent or broken, or even still lodged in walls.[234] Unlike other sites with large quantities of arrowheads, Tufnell did not elect to create a typology for Lachish, yet the vast number of the arrowheads made a full and complete publication of all examples impractical. Therefore, there are many groups of arrowheads of which only one example is illustrated. Furthermore, there are several groups of arrowheads where the given quantity is nothing more precise than "large numbers."[235] Gottlieb, on the other hand, did create a typology for the arrowheads found in the later excavations (retroactively including some of the examples from the British excavations), however the typology is limited to iron arrowheads only.[236]

[233] Tufnell 1953, p. 57
[234] Tufnell 1953, p. 385
[235] Tufnell 1953, pl. 39:4-6
[236] Gottlieb 2004, pp. 1913-1948

Type	Description	Example
I	Plain leaf-shaped arrowheads	
I-1	-Lanceolate arrowhead	Lachish 107
I-1-A	--Narrow blade	Lachish 174
I-1-B	--Thick, heavy blade, with thickened middle or lower part	Lachish 162
I-1-C	--Laurel leaf shaped blades	Lachish 143
I-2	-Elongated ovoid form	Lachish 218
I-3	-Triangular blade	Lachish 276
II	Arrowheads with thickening between blade and tang (stopped)	Lachish 358
III	Arrowheads with central rib	Lachish 17
IV	Arrowheads with elongated pyramidal form (square bodkins)	Lachish 177
V	Poker-shaped arrowheads (round bodkins)	Lachish 135
VI	Spindle-shaped arrowheads	Lachish 196
VII	Miscellaneous arrowheads	
VII-1	-Pike-shaped arrowheads (square bodkins)	Lachish 62
VII-2	-Spatulate arrowhead	Lachish 38

Figure 8.8: Typology for arrowheads from Lachish; after Gottlieb 2004.

Gottlieb's types encode both distinct features, such as ribs and stop, and other more subjective factors, such as the relative shape of the blade. The latter betray a strong influence from prior typologies, such as the Cross & Milik study[237] which used botanical terms for arrowhead shapes (lanceolate, ovoid, etc.) and John Curtis' study of the Nimrud arrowheads (the poker-shaped arrowheads).[238] As was the case with previous arrowhead typologies, the arrowhead features were not clearly defined before constructing the typology, and this has led to a somewhat subjective division of arrowheads between the different types. For example, separate types are designated for different shapes of blades (the subdivisions of Type I) yet there is also a different type for those with pronounced stopped tangs (which Gottlieb terms a "thickened middle or lower part"[239]). Gottlieb herself acknowledges that many of the blade-shape types had their own "variant with a stop,"[240] and she classified these along with non-stopped arrowheads with a similar blade shape. Yet she classified arrowheads with more pronounced stops - a subjective determination - in a separate type (Type II) regardless of blade shape. Thus, there is the need for a typology that logically includes all possible combinations of distinct arrowhead features.

The vast majority of the arrowheads found at Lachish are leaf-shaped, with and without stops, and made of iron. Most of these have lenticular sections; only eight have ribs (Type 5q-1). A considerable number of bodkin-type points (Types 1a-1, 1a-2, 1c-1 and 1c-2) were also found, sometimes associated with arrowhead finds. Only one socketed bronze arrowhead was found – a

[237] Cross & Milik 1956
[238] Curtis 2013
[239] Gottlieb 2004, p. 1924
[240] Gottlieb 2004, p. 1924

trilobate – but it dates from the 'post-exilic' period (approximating the Achaemenid Period),[241] and is therefore later than the period covered by this work.

Three groups of arrowheads were labeled "caches" by Tufnell. The 40 arrowheads of the group from Room H.15:1003 were found among the debris of the roof; it is not explicitly stated how closely the arrowheads were associated with one another, but the plan suggests they were within an area not much more than 2 meters square, possibly much closer.[242] The arrowheads may have been present on the roof at the time of its collapse (in which case one might assume they could have become spread out as they fell, or if they were all found together, they could have been deliberately buried together in the roof debris by a survivor of the destruction. But it appears more likely that they had been attached to arrows which were held together in a quiver of a perishable material which subsequently burned or rotted away, or if they had been loose arrowheads, they may have been together in a sack or basket.

Of the seven arrowheads illustrated from this "cache," 5 are leaf-shaped with unstopped tangs, one has a stopped tang, and the last is a long conical bodkin (though the actual section is somewhat ovular).[243]

Room 1098 contained over 50 arrowheads, "mostly fused into one mass."[244] No further information is give about the circumstances of the find. However the fact that they had corroded together indicates that they had been in contact with each other when deposited, quite possibly in a single quiver. The six illustrated examples are all leaf-shaped, and all but one have unstopped tangs.[245] Like the cache described above, they vary a great deal in size.

The cache at Locus 1070 is much smaller, with only 12 arrowheads, most of which were corroded together.[246] If it had been a quiver, it must have been largely empty when dropped. Only two arrowheads from this find are illustrated, one leaf-shaped with a stopped tang, one with an unstopped tang.[247]

An example of a quiver full of arrows has been found at Karmir Blur, and in that case the arrowheads were mostly of the same type, though they did display some variety in size.[248] A 2nd Millennium text

[241] Tufnell 1953, p. 386
[242] Tufnell 1953, pp. 106-108
[243] Tufnell 1953, pl. 60:2-8
[244] Tufnell 1953, p. 115
[245] Tufnell 1953, pl. 60:16-21
[246] Tufnell 1953, p. 120
[247] Tufnell 1953, pl. 60:26-27
[248] see Piotrovsky 1970, the unnumbered plate at the end of the Russian section. The arrowheads are all Type 5d-14, with the exception of one smaller example that lacked barbs.

from Mari discusses the king's need for arrows of a number of different weights during a siege,[249] so a mixture of different sizes and even styles of arrows in a single quiver may have been quite normal (see §6.4.1).

Tufnell assumes that these "caches" of arrowheads belonged to the defenders,[250] however this need not be the case. If the caches were in fact the contents of quivers, the quiver containing them could as easily have been dropped by an attacker during the storming of the city as by a defender (one such discarded quiver has been discovered at Hasanlu, however that example was empty[251]). The leaf-shaped iron arrowheads have clear parallels from Assyrian sites, particularly Nimrud, and therefore could as easily be Assyrian as Judean. Tufnell observes that bodkins (which she refers to as "iron spikes"[252]) were "characteristic" of the two larger caches.[253] It is true that round bodkins are very rare at Assyrian sites, while they do appear at nearby Gerar.[254] However, any supposition that they were characteristic of the Judaeans is undermined by the fact that they are also very well attested at Sialk (see Type 1a-2 and Type 1a-4).

Both Rothenberg and Gottlieb also attempted to attribute certain arrowheads to specific ethnic groups. Rothenberg proposed that the bodkins found at Lachish must have been of local manufacture since they were a "formidable defense weapon," designed to pierce armor.[255] Based on the assumption that the arrowheads must be either Judean or Assyrian, he also observed that no bodkins were found at the major sites in the Assyrian heartland, thus they must be Judean.[256] While bodkins are indeed rare at Assyrian sites, they are nevertheless attested (a Type 1a-8 from Nimrud and three small Type 1c-1 from Assur). What is more, however, Rothenberg appears to be viewing the deposition of arrowheads in a territorial manner, as in the case of ceramics. However, arrowheads are expendable military gear, and therefore their pattern of deposition will more clearly reflect the military activity of a group than the patterns of their settlement. Most Assyrian arrowheads were doubtless fired outside of Assyria during Assyria's many military campaigns. Some of the arrowheads found at sites in the Assyrian heartland doubtless were Assyrian in origin, yet others would have belonged to Assyrian allies and still others to attackers. Thus one may expect to find characteristically Assyrian arrowheads (if such a thing existed) primarily outside of Assyria, in areas where Assyria was militarily active, such as Lachish. Thus, the bodkins are just as likely to be Assyrian as Judean.

[249] Miller *et al* 1986, p. 189
[250] Tufnell 1953, p. 108
[251] Muscarella 1989b, p. 28
[252] Tufnell 1953, p. 108
[253] Tufnell 1953, p. 108
[254] for example, Petrie 1928, pl. 32:19
[255] Rothenberg 1975, p. 79
[256] Rothenberg 1975, pp. 79-80

Gottlieb acknowledged that arrowhead type is not adequate to indicate who made or fired them.[257] She instead proposed using the location of the finds to both map the course of the Assyrian siege of Lachish and determine who fired which arrows. This approach, however, makes a number of unwarranted assumptions. The first is that all of the the arrowheads in question were deposited during the historically attested Assyrian attack on Lachish during the reign of Sennacherib, an assumption that she derived from Ussishkin.[258] While a convincing argument was made that a siege ramp was found in Area R, Ussishkin appears to assume that since it is a siege ramp and Sennacherib's reliefs show a siege ramp, and the dating of objects found with it appear to broadly fit with that date, then it must be Sennacherib's siege ramp. However, the stratigraphy of the siege ramp suggests that it could be later in date. A portion of it covers Wall 'b', which has been dated to Level II (ca. 700-600 BC), however Ussishkin assumes that either a portion of the siege ramp must have collapsed onto the later Wall 'b' or that the wall itself must actually date earlier, to Level IV-III.[259] He rejects a possible later date for the siege ramp merely because the severity of the fire in the corresponding destruction level "better fits the situation at the end of Level III rather than at the end of Level II."[260] Needless to say, rejecting solid stratigraphic evidence on the basis of such a subjective determination is questionable. Furthermore, fires need not be the same intensity in all locations of a city, thus there is no reason to rule out the possibility that the siege ramp was connected with the later destruction. In any event, this demonstrates that the indentification of the siege ramp with the attack of Sennacherib is far from certain. At best, a probable association could be made between the ramp and the historical event.

Gottlieb made other assumptions, such as that arrowheads near to the city wall must belong to attackers, since the arrows of the defenders would have carried some distance away.[261] However, if the walls were being stormed, the defenders may well have fired directly down at attackers scaling the walls or perhaps gathered at the base of the wall, trying to undermine it, thus defender arrows could have been deposited at the very base of the wall itself. Furthermore, there is always the possibility that the defenders made sorties outside of the walls to try to drive the attackers back, and also the possibility that the attackers may have managed to storm a section of the walls but then be driven back. Had either of these occurances taken place, the pattern of deposition of attackers' and defenders' arrows would be hopelessly confused. Unless there is a clear, detailed historical record that recounts the course of the battle (which does not exist for any ancient Near Eastern battle), trying to reconstruct it from arrowhead deposits is an exercise in futility.

[257] Gottlieb 2004, p. 1951
[258] see Ussishkin 2004
[259] Ussishkin 2004, p. 718
[260] Ussishkin 2004, p. 718
[261] Gottlieb 2004, p. 1953

A quantity of bone points were found at Lachish. Eight of them were found on a stairway, apparently not associated with a destruction level, which inspired Tufnell to speculate that perhaps bone arrowheads "were used in more peaceful pursuits" than combat.[262] Nevertheless, one iron arrowhead was found with the 8 bone ones, and further bone arrowheads were found in apparent destruction levels, which suggests that they may indeed have been used during combat. However, they must have been a weapon of last resort, as they would have indeed been of questionable use for military purposes. The very light weight of bone would have reduced the ability of the arrow to penetrate the target, and bone not being nearly as resilient as metal, would be far more likely to break on impact. The bone arrowheads from Lachish comprise two basic forms: a slender, needle-like bodkin, pointed at both ends (like Type 1a-1) and a more conventional leaf-shaped arrowhead with a tang (akin to Type 5a-1).

8.8.2. Gerar (Tell Jemmeh)

Tell Jemmeh (or Gemmeh) is situated some 8 miles south of Gaza and was excavated from 1926 to 1927 by the British School of Archaeology in Egypt under the direction of Petrie.[263] Petrie associated the site with ancient fortress of Gerar, however this identification has been disputed.[264] Since the secondary literature that deals with the arrowheads from this site also refer to it as Gerar, it will also be referred to by that name in this work to avoid confusion.

Petrie's dating of artifacts from Gerar was unfortunately not up to modern standards. Items recovered from the site were given a two-letter code indicating the location in the site that they were found, and the elevation of the find, rounded to the nearest foot. Petrie identified 6 major phases of construction, obtained a rough date for each of them,[265] and then constructed a chronological matrix which equated the elevation within the tell to an absolute date,[266] with each foot in elevation covering an even number of years (about 40 years). Petrie stressed that the mound was built up in "remarkably uniform" levels,[267] however it is impossible to conceive of a site with perfectly level, regular strata with all contemporaneous surfaces on the same plane, still less for such a state of affairs to continue for over 1000 years!

Nevertheless, Petrie did identify 6 principle building phases at Gerar, each successive one largely ignoring the layout of the previous settlement.[268] The dating of these building phases is based on a

[262] Tufnell 1953, p. 119
[263] Petrie 1928, p. 1
[264] e.g. Maisler 1952, who identifies it with Yurza (Arṣa in Assyrian inscriptions)
[265] Petrie 1928, p. 3-5
[266] Petrie 1928, pl. 5
[267] Petrie 1928, p. 4
[268] Petrie 1928, p. 3

very scant collection of chronological benchmarks. The building with its foundations at an elevation of 197-8 feet was dated by Petrie to the reign of the pharaoh Psamtek I (ca. 660 BC) because the structure resembled Psamtek's fortresses Naukratis and Daphnae, and because it also contained pottery similar to that found at Daphnae.[269] Below it was another building level (192-197 feet), which, according to Petrie's dating scheme was 150 years earlier, and since there was no documented Egyptian invasion around 810 BC, he assigned it to the Judean king Amaziah adding fortifications after conquering Edom.[270] The 183-189 foot level was dated to the reign of Sheshenq I because a hoard of Egyptian jewelry characteristic of the 22nd Dynasty was found buried under the floor of a house that Petrie implies was itself Egyptian. As Sheshenq I was the only Egyptian king known to have held Palestine between 1200-664 BC, Petrie assumed the construction must have taken place in 932 BC, when he occupied the city.[271] The next datable artifact is a scarab of Ramses III, ca. 1194 BC.[272]

Had Petrie mapped the strata of the tell, one could at least make something of the major building phases to make a chronological framework, however since he relies entirely upon elevation, this cannot be accomplished. The socketed bronze arrowheads from Gerar demonstrate that the stratigraphy of the site must have been considerably more complicated than Petrie allowed for. For example, the socketed hooked bilobate illustrated in pl. 29:2 was found at an elevation of 190 feet, which, according to Petrie's method, dates to ca. 980 BC. Subsequent research has demonstrated that socketed bronze arrowheads were only introduced in the Near East in the mid 7th Century BC,[273] so unless we are to assume that Gerar had these kind of arrowheads two centuries before any other sites in the region, one must assume that either it was an intrusion from a higher level, or that the strata at that elevation and that part of the tell date to much later than Petrie allowed for. Given that many of the socketed bronze arrowheads come from elevations dated by Petrie to earlier than the mid 7th Century, the latter appears the more likely, and throws the dating of all artifacts from Gerar into doubt.

Since Gerar has indeed produced a large quantity of arrowheads, and is often cited in discussions about arrowheads, I have included it in this study. However, because of these problems with dating, the Gerar material is only used comparatively, not for chronological analysis.

[269] Petrie 1928, p. 4
[270] Petrie 1928, p. 4
[271] Petrie 1928, p. 4
[272] Petrie 1928, p. 4
[273] e.g. Derın & Muscarella 2001, p.197

A wide variety of arrowheads were found at Gerar. Most forms of socketed bronze arrowheads were represented,[274] but even larger numbers of tanged iron forms are attested. Petrie classified these as "lanceheads,"[275] and some of the larger examples could perhaps have served as such, but the sizes of the majority are much more consistent with arrowheads and javelin points. Some examples of the socketed bronze arrowheads were found in the same areas and at similar elevations to tanged iron points,[276] which indicates that they were, at least at times, being used simultaneously.

Several finds are worthy of special note. A large ribbed leaf-shaped point with a tang has a "rhomb" inscribed in its face.[277] Petrie identified this as an Assyrian lance head due to the appearance of that symbol on cylinder seals.[278] It could as easily be a large arrowhead or javelin point, however. If the "rhomb" is a characteristic symbol of Assyrian manufacture, furthermore, one would expect to find it more commonly on artifacts.

Petrie identified two further points which are likely arrowheads or javelin points as light spear heads. One, pl. 28:4, is leaf-shaped with a heavy stopped tang (Type 5b in this work), and at 11.8 cm long, it is on the large size for an arrowhead, but still seems too small to be a spear head. The other, pl. 28:5, is an even simpler form, without a stop on the tang, and is of a similar length, 12.4 cm, so the same arguments apply.

Also of note are eight square bodkin points, all made of iron.[279] They were found in various locations and date, according to Petrie, from 900-600 BC. The majority have a well-defined tang and often a stop, though two examples simply taper to another point. Petrie identified them as belonging to large arrows or bolts used for piercing armor.[280] Curiously, there are far fewer round bodkins from Gerar, only one with a stopped tang, pl. 23:21 (which Petrie identifies as a borer[281]) and pl. 29:54, a ferrule-type point.

8.9. Conclusions

The sites chosen for this survey are intended to provide a representative sample of arrowheads in use in the Neo-Assyrian Empire and its surrounding areas. Some sites were included because they have large samples of arrowheads that have been used extensively in previous studies of arrowheads,

[274] Petrie 1928, pl. 29:1-22; Petrie refers for sockets as "tubes", see p. 15
[275] Petrie 1928, p. 16
[276] e.g., one example of a long-socketed trilobate, Petrie 1928, pl. 29:16, was found at A 196, and a waisted iron arrowhead, Petrie 1928, pl. 29:59, at A 197
[277] Petrie 1928, pl. 23:29
[278] Petrie 1928, p. 13
[279] Petrie 1928, p. 15 & pl. 28:13-20
[280] Petrie 1928, p. 15
[281] Petrie 1928, p. 13

though they may be lacking in accurate chronological data (e.g. Gerar). Indeed, many of the sites surveyed here have only fairly approximate dating for the artifacts found at them (such as simply "Neo-Assyrian"), which will make the resulting typology a less precise chronological tool and reduce the ability to use arrowhead types as dating fossils.

The possibility of relating destruction levels to historically-attested events raises the possibility of dating the deposition of artifacts found within those destruction levels with great precision, down to a single year. However, these correlations have often been made in a rather *ad hoc* manner rather than on any rational, systematic criteria. Such criteria have therefore been proposed and applied to the relevant sites, with some rather surprising results. The siege ramp at Lachish, typically associated with the attack of Sargon II, cannot in fact be confidently linked to that event. Furthermore, while the destruction of Nimrud must certainly have taken place around the time of the destruction of the other major Assyrian cities in 614 and 612 BC, the historical texts that discuss those destructions to not mention Nimrud, therefore it is not appropriate to assign its destruction to a specific date as it may be conceivable, for example, have held out some time longer than other Assyrian cities.

9. Typology of Arrowheads

9.1. Types of arrows in texts

Aside from texts giving arrows etic identifiers (see §7.1), Assyrian texts refer to arrows by three different words: *šiltaḫu*,[1] *uṣṣu*[2] and *mulmullu*.[3] The term *girru* was also used in a Neo-Babylonian text (see §6.1). Unfortunately, the context of these references does not indicate whether or not they referred to different kinds of arrows, and if so, what their characteristics were. *Šiltaḫu* (often written logographically as GIŠ.GAG.TAG.GA or GIŠ.GAG.UD.TAG.GA[4]) may be considered the standard word for "arrow," used both in prosaic[5] and literary or formal contexts.[6]

The term *uṣṣu* is generally used in literary contexts. There are several cases where inscriptions list military equipment, and *uṣṣu*-arrows are the only kind of arrow listed alongside bows. For example, an inscription of Sennacherib describes his rebuilding of a palace (apparently intended as an arsenal), which he stocked with "quivers, bows, and *uṣṣu*-arrows."[7] This may suggest that *uṣṣu* was merely a poetic word for arrows in general, however inscriptions of Sargon II[8] and Sennacherib[9] list *mulmullu* and *uṣṣu* arrows together in the same passages, which suggests that, at least some contexts, *uṣṣu* and *mulmullu* had a more specific meaning than simply "arrow."

Saggs translated *mulmullu* as "javelin,"[10] however this translation does not seem probable. *Mulmullu* is used in several contexts where it refers unambiguously to arrows rather than javelins. A Middle Assyrian text referred to "nocking"[11] a *mulmullu* and fixing its bowstring. Inscriptions of Assurnasirpal II and Shalmaneser III mention raining *nablī mulmullī* onto their enemies,[12] and while these could conceivably be interpreted as "fire javelins," it is much more likely that "fire arrows" were meant, given that arrows have much greater range than javelins, and fire javelins are otherwise completely unattested. In addition, a Neo-Assyrian text referred to *mulmullū* from the quiver (*išpatu*)

[1] SAA III 32, 31 & RINAP III, Sennacherib 23, v62
[2] e.g. RINAP III, Sennacherib 4, 57
[3] e.g. RINAP I, Tiglath-pileser III 28, 6 & SAA III 37, 11'
[4] SAA III, p. 150
[5] e.g. SAA VII 126, 17 & SAA XVII 158, 10
[6] e.g. SAA III 17, 21, SAA III 38, 35 & RINAP I, Tiglath-Pileser III 9, 11'
[7] RINAP III, Sennacherib 22, vi 67-68; see also RINAP III, Sennacherib 4, 57 and RINAP III, Sennacherib 25, ii' 6'
[8] Saggs 1963, p. 152
[9] RINAP III, Sennacherib 18, v28-29; RINAP III, Sennacherib 22, v80; RINAP III, Sennacherib 23, v80; all of these appear to be duplicates of the same text.
[10] Saggs 1963, p. 152
[11] The *Št*-stem of *rakābu* is used here instead of the perhaps more conventional D-stem of *malû*; CAD, Vol. M, Part II, p. 191 (*mulmullu*)
[12] Grayson 1991, p. 225 (A.0.101.2, 21b-23a); Grayson 2002, p. 21 (A.0.102.2, 66b-75a); CAD, Vol. M, Part II, p. 191 (*mulmullu*)

of a deity.[13] Thus, the term *mulmullu* is best interpreted as a form of arrow. Pleiner & Bjorkman identified it as a royal votive arrow,[14] though the reference to it being used as a fire arrow indicates that it likely served a variety of different functions.

9.2. Types of arrowheads in iconography

Innumerable arrows are depicted in Neo-Assyrian iconography, particularly on larger public displays such as palace reliefs. It may, therefore, seem desirable to make a comparison between these depictions of arrowheads and actual preserved arrowheads, much like Amy Barron did with other forms of Neo-Assyrian military equipment.[15] However, while iconography is often an excellent source for the morphology of larger weapons (such as spears or swords) where the scale is sufficient for the detail to be clear, arrowheads are generally too small to be treated with any detail. The comparatively small size at which most reliefs are published in secondary literature only exacerbates this situation and precludes any truly thorough study. Nevertheless, the available source material allows some conclusions to be drawn.

The vast majority of arrowheads in Neo-Assyrian artwork are flat with leaf-shaped blades and rounded shoulders (Type 5a-1 or 5b-1; see Figure 9.1, no. 16). However, more elaborate ribbed arrowheads do sometimes appear, including those with rounded shoulders (Type 5p-1 or 5q-1; see Figure 9.1, no. 15), concave shoulders (Type 5p-3 or 5q-3), and even pentagonal blades (Type 5p-41 or 5q-41; see Figure 9.1, no. 17).

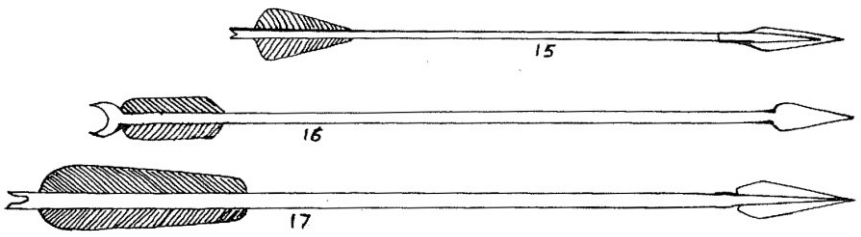

Figure 9.1: Arrows from Assyrian reliefs. No. 16 is from the reliefs of Assurbanipal at Nineveh and Nos. 16 & 17 are from the reliefs of Assurnasirpal II at Nimrud; after Madhloom 1975, pl. 26.

In the reliefs of Assurnasirpal II, the portrayal of ribbed arrowheads appears to be related to the size of the figures being depicted. Assurnasirpal II 33 is a single register orthostat, and the figures depicted thereon are nearly as tall as the orthostat itself (2.3m high). The two arrows held by the king on this

[13] CAD, Vol. M, Part II, p. 191 (*mulmullu*)
[14] Pleiner & Bjorkman 1974, p. 286
[15] Barron 2010

relief have distinct ribs and pentagonal blades (see Figure 9.1, no. 17).[16] Assurnasirpal II 23, however, is one register of a two-register orthostat (97cm high), thus the figures depicted upon it are roughly half the size as those in Assurnasirpal II 33.[17] The heads of the arrows held by the king in this scene do not have ribs (see Figure 3.11). The more elaborate arrowhead form, therefore, is used for larger-scale depictions where extra detail would be desirable.[18]

The only unambiguous example of ribbed arrowheads in the reliefs of Tiglath-Pileser III are found in one scene where the king holds a bow and two arrows while receiving prisoners (see Figure 3.12), a relief which appears to have occupied one register of a two-register orthostat.[19] When the king holds arrows in other scenes, they are not discernibly ribbed.[20] Evidently, ribbed arrowheads were not restricted to the largest-scale figures in the reliefs of Tiglath-Pileser III, though size may still explain why they were used on Tiglath-Pileser III 59, where the seated king is roughly as tall as the register, while in the chariot battle scene Tiglath-Pileser III 15, he is roughly half as tall as the register. Tiglath-Pileser III 74 is more ambiguous, as it is fragmentary and damaged. Its size (0.58m high[21]) suggests that the king was roughly as tall as the register. It is possible that the arrows he fires are ribbed, but the relief is so badly weathered that the ribs can no longer be discerned. If this is not the case, then the usage of ribbed arrowheads in the reliefs of Tiglath-Pileser III must be somewhat irregular.

The sole certain example of ribbed arrowheads from the reliefs of Sargon II belong to arrows held by an archer in a hunting scene (see Plate 4C).[22] This relief has been dissociated from its original context, and as the preserved fragment is 1.28m in height (making the archer roughly two-thirds life size), it most likely belonged to one register of a two-register orthostat. It is therefore unlikely that the ribbed arrowheads were added due to the size of the relief. No other ribbed arrowheads can be discerned in the published depictions of the Khorsabad reliefs, though the small scale at which most are reproduced in the secondary literature leaves open the possibility that other examples remain unidentified.

[16] Budge 1914, pl. 33 (BM 124567); http://www.britishmuseum.org/research/collection_online/collection_object_details.aspx?objectId=367056&partId=1&searchText=124567&page=1, accessed February 16, 2015.
[17] Budge 1914, pl. 23 (BM 124537); http://www.britishmuseum.org/research/collection_online/collection_object_details.aspx?objectId=367028&partId=1&searchText=124537&page=1, accessed February 16, 2015.
[18] Note also the elaborate decorations on the trim of the king's robe in the same scene.
[19] Barnett & Falkner 1962, pl. 59
[20] e.g. Barnett & Falkner 1962, pls. 15 & 74
[21] Barnett & Falkner 1962, pp. 32-33
[22] Albenda 1986, fig. 76 (BM 118829; see Reade 1998, p. 48, no. 49 for a clearer reproduction)

Among the pulished reliefs of Sennacherib, the one certain example of ribbed arrowheads are those being fired by enemies in a single fragment from Forecourt H of the Southwest Palace (and which may actually date to Assurbanipal).[23] In the one depiction of the king holding arrows, no ribs are evident on the arrowheads (see Figure 3.18).[24] Therefore, high status associations which ribbed arrowheads may have possessed earlier in the period appear to have disappeared in the reign of Sennacherib, though, as with the case of the reliefs of Sargon II, there may be other examples as yet unidentified due to the small scale of the published reproductions.

Ribbed arrowheads make a dramatic resurgence in the hunting scenes of Assurbanipal from the North Palace, however. Some of the arrows with which Assurbanipal hunts his prey have rounded shoulders[25] while others have concave shoulders.[26] However, their usage is not always consistent. Most of the visible heads of arrows piercing lions are ribbed, however one, protruding from the belly of a lioness, has no rib.[27] Nevertheless, the king is consistently depicted firing ribbed arrowheads, though while the arrows held by his attendants sometimes have ribbed heads,[28] sometimes they have heads without ribs.[29] While not used with perfect regularity, the pattern of usage indicates that ribbed arrowheads had a strong assoctiation of status in the reign of Assurbanipal, given that the king invariably fires one and no one else does.

Though several different arrowhead forms were employed in Neo-Assyrian iconography, and in some cases, employed in a meaningful way (ribbed arrowheads indicating high status), the limited repertoire of attested forms (lenticular with rounded shoulders, ribbed with rounded shoulders, ribbed with concave shoulders, and ribbed pentagonal) in comparison with the wide variety attested in artifacts makes iconography of little practical use in constructing a typology. Furthermore, it is usually impossible to determine if the arrowhead possesses a stop (a significant morphological feature) as they are mounted on shafts which hide the tang. Only in cases where there is a clear line dividing the bottom of the arrowhead from the arrow shaft can it be reasonably assumed that the arrowhead is stopped (e.g. Figure 9.1, no.15). Thus, the typology of arrowheads presented in this work must be based on the artifacts themselves.

It is, however, noteworthy that the proportions of arrowhead forms attested in iconography resembles the proportions of comparable artifacts. Most arrowheads in iconography appear to be non-ribbed (lenticular section) and have rounded shoulders. Types 5a-1 and 5b-1 represent 58.4% of all

[23] Barnett, Bleibtreu & Turner 1998, p. 49 & pl. 27
[24] Barnett, Bleibtreu & Turner 1998, pl. 342 (BM 124911)
[25] Barnett 1976, pls. 12 & 52 (see Barnett 1960, pls. 69 & 84 for detail reproductions)
[26] Barnett 1976, pls. 8, 7, 57 & 51 (see Barnett 1960, pls. 63, 74, 91 & 103 for detail reproductions)
[27] Barnett 1976, pl. 13, upper left (see Barnett 1960, pl. 71 for detail reproduction)
[28] Barnett 1976, pl. 52, far right of bottom register (see Barnett 1960, pl. 83 for detail)
[29] Barnett 1976, pl. 59, left side of top register (see Barnett 1960, pl. 91 for detail)

arrowheads surveyed by this work (774 of 1325). Ribbed arrowheads are far less common, the most widely attested form having rounded shoulders; Types 5p-1 and 5q-1 represent 2.6% of the arrowheads examined here (35 of 1325). The ribbed arrowheads with concave shoulders are quite rare, and even more so, the pentagonal bladed arrowheads attested only in the reliefs of Assurnasirpal II. Types 5p-3 and 5q-3, with concave shoulders, have only a single example attested among the sites surveyed, and Types 5p-41 and 5q-41, with pentagonal blades, have only two examples. Therefore, though their repertoire of arrowhead forms is limited, iconographic sources may nonetheless present their relative proportions in a realistic manner.

9.3. Emic versus etic approaches

When analyzing the material culture of any dead civilization, one is faced with the dilemma of how best to interpret the data: should one attempt see the artifacts as the people who used them would have, or attempt to analyze them in a systematic, objective manner regardless of how the people who created and used them may have classified them. Linguist Kenneth Pike coined terms to refer to these two approaches, "emic" for the former and "etic" for the latter, in order to specify how, on the one hand, people interpret the sounds in their own language versus the way linguists systematically analyze the sounds in languages.[30] The distinction applies just as well to material culture as it does to linguistics. It would be inaccurate to say that etic approaches are more objective than emic, rather that etic approaches are arguably more systematic. Nevertheless, etic analyses may be bereft of insights into the usage of the objects in question that the people who used them in practice would have had.

It would perhaps be ideal to take an emic approach to this material and define ancient Near Eastern arrowheads in the terms that the people who made and used them did. Unfortunately, as discussed above (§9.1), textual sources that deal with arrows tend to be very vague about just what distinctions the various terms implied. Indeed, the difference between the three stated types (assuming that they were not in fact simply synonyms) may have been based on features of the shaft or fletching rather than the arrowheads. Furthermore, there is a far greater variety in arrowheads than in recorded terms to describe them.

This leaves us with only the artifacts themselves to help us understand the way in which they were interpreted by their makers, a notoriously difficult state of affairs. Many forms of arrowhead have no clear functional difference from others. For example, those with angled shoulders would likely perform as well as those with rounded shoulders. Thus features of arrowheads do not always translate to functional differences. These differentiations are referred to as "cognitive styles,"[31] and were no

[30] Harris 1976, p. 331-332
[31] Miller *et al* 1986, p. 189

doubt influenced by the cultural backgrounds and aesthetic inclinations of their makers.[32] In some cases, however, there are clear emic divisions between types of arrowheads with similar features, such as the characteristically Urartian Type 5z-14.

However, it cannot always be discerned what features of an arrowhead were seen as significant to the people who produced it. Particularly in the case of iron arrowheads, there can be a significant amount of variation in the overall shape of arrowheads, and it is not always clear if it is the result of natural variation or a deliberate attempt to make a specific shape. Therefore, the approach taken in this study is primarily etic, though when a clear cognitive style is evident, it will be included as well.

It is very problematic to try to infer what the makers of arrows in the ancient Near East would have classified as distinct types based simply upon the surviving artifacts. What seems a clearly distinguishing feature to modern eyes may not have to theirs, and the nuances that may have been important to them may not be apparent to modern researchers.

9.4. Previous typologies

There have been several significant typologies for ancient Near Eastern arrowheads. All of them, however, concern themselves with finds from individual sites, and often use different criteria to distinguish between defined arrowhead types.

9.4.1. Neo-Assyrian

John Curtis created a typology for Neo-Assyrian arrowheads, based primarily on the arrowheads from Nimrud (see Figure 9.2),[33] and it appears to be partially based on the typology that Stronach created for the arrowheads from Fort Shalmaneser (see §8.3.1).[34] He divided iron arrowheads into seven types on the basis of shape, and an 8th category for varia which cannot be assigned to any of the other types. Socketed bronze arrowheads are divided into 3 categories based on whether or not it is bilobate or trilobate, and whether or not it has a hook (which Curtis terms a "side catch").

As it is properly feature based, this typology could be a good basis to work from, however its origins as a typology for Nimrud arrowheads is still evident, preventing it from being a properly regional typology. There are many arrowhead varients that this typology does not address (bilobates without hooks, for example), and it neglects many of the finer distinctions in form such as the different types

[32] For a discussion of the interaction of group and individual identity as expressed by the form of an object, see Wiessner 1983, pp. 256-259.
[33] Curtis 2013, pp. 39-43
[34] Stronach 1958, p. 171

of shoulders, stops, etc. Thus, in order to be applied regionally, it must be significantly expanded and refined.

Type	Description
Iron	
1	leaf-shaped, no stop
2	leaf-shaped, stopped tang
3	leaf-shaped w/ rib, stopped tang
4	leaf-shaped w/ rib & squared shoulders, stopped tang
5	round bodkins (or slightly lenticular), stopped tang
6	leaf-shaped with thick, straight sided tangs
7	long, slender lanceolate blades with no stop
(8)	(varia)
Bronze	
1	bilobate with hook
2	trilobate with hook
3	trilobate without hook

Figure 9.2 Typology of Neo-Assyrian arrowheads (Curtis 2013).

9.4.2. Cleuziou (socketed bronze arrowheads)

Cleuziou[35] made a typology for socketed bronze arrowheads (and one tanged iron trilobate) between the 9th and 3rd Century BC.[36] It consists of 38 examples, each labeled with a letter (E through H) and a number, arranged in 7 rough chronological groups. Unfortunately, Cleuziou does not explain the workings of his typology, so it is not clear which features of the arrowheads the types are based upon. While his typology covers a large area and much of the 1st Millennium BC, its restriction to specific kinds of arrowheads (those relevant to his study of "Scythian" antiquities) limits its usefulness for broader applications.

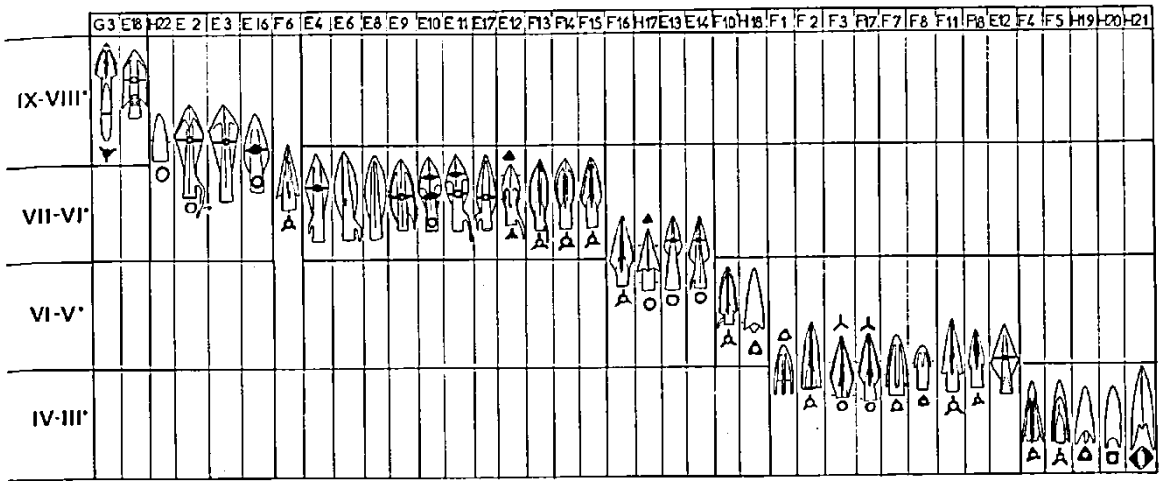

Figure 9.3: The typology of Cleuziou – note the one tanged trilobite is the farthest left, G3; after Cleuziou 1977, p. 189, fig. 1.

[35] Cleuziou 1977
[36] see Cleuziou 1977, p. 189, fig. 1

9.4.3. Medvedskaya (arrowheads from Iran)

Medvedskaya[37] also made a typology for socketed bronze arrowheads,[38] as well as one for iron arrowheads.[39] These typologies, however, are limited to material from Iran (though the iron arrowhead typology provides comparative examples from other sites throughout Western Asia). The typology for iron arrowheads is quite basic, listing seven different types (I, IIa, IIb, IIc, III, IV, V) and they appear to be divided primarily by the form of the shoulders: I had normal rounded shoulders, IIa has angled or concave shoulders, IIb has squared shoulders (and one example is ribbed, while the other is not), III has angled shoulders (and both examples are ribbed), IV has barbed or swallowtail shoulders and V had an unusual short concave chisel-type point. The typology for socketed bronze arrowheads is not really a proper typology at all – it lists which sites the arrowheads come from, and within some of the site groupings, the arrowheads are divided into several rough categories which appear to be based more on chronology than on form.

9.4.4. El-Khadr

The earliest typology, both in date of publication and in date of the artifacts in question, is that created for the 12th-11th Century BC arrowheads and javelin heads from el-Khadr, near Bethlehem.[40] Cross & Milik did not try to separate the javelin heads from the arrowheads in their typology, but rather based their divisions solely on blade shape. This resulted in 12 types, generally given names based on botanical terms for leaf shapes,[41] many of which have continued to be used in subsequent studies (including in this work). Cross & Milik did entertain the idea that ribs were significant elements, though they did not use them as a criterion in their typology.[42] While this article was significant, and the terminology it proposed was used by other authors to describe their finds, Cross & Milik themselves acknowledge their system may be oversimplified due to the lack of comparative material.[43] It is furthermore limited to bronze points from a relatively limited time span, and so there are many forms that would become extremely common later which are not reflected at all in this typology. The el-Khadr typology does, however, provide a late 2nd Millennium BC basis, from which early 1st Millennium developments may be traced.

I have for the most part not made use of the el-Khadr typology in the development of the typology offered here, since differentiations between blade shapes can be rather arbitrary. This is particularly the case with the iron arrowheads so common in the early 1st Millennium, where there is a large

[37] Medvedskaya 1982
[38] Medvedskaya 1982, fig. 15
[39] Medvedskaya 1982, fig. 14
[40] Cross & Milik 1956
[41] Cross & Milik 1956, p. 16
[42] Cross & Milik 1956, p. 18
[43] Cross & Milik 1956, p. 16, footnote 2

amount of natural variation between each piece. In terms of distinct features, most of the el-Khadr types are essentially leaf-shaped with unstopped tangs, and so would fall into the same category in this work.

9.4.5. Other Near Eastern typologies

The other Near Eastern typologies – Nimrud, Marlik, Toprakkale, Hasanlu, Lachish, and Ayanis - are discussed in greater detail in the Arrowhead Finds chapter (§8). Nimrud covers all of the arrowheads found at Nimrud, however it is not very detailed. Toprakkale's typology has more nuances, but only covers the iron arrowheads (since only 4 bronze ones were found there). Marlik and Lachish have the most extensive typologies, though Marlik deals only with bronze arrowheads and Lachish only with iron ones. The typology for Ayanis deals with all the iron and bronze forms found at that site, and the Hasanlu typology (itself based on the Ayanis typology) deals with arrowheads of all materials, but only those from Hasanlu IVB. In all cases, the utility of these typologies for more general use is limited by the fact that they deal with only the forms found in one location, and no single site has produced an example of every kind of arrowhead.

9.4.6. Marathon Arrowheads

Erdmann created a typology for the arrowheads found at Marathon, presumably dating to the Battle of Marathon.[44] Consequently, this typology deals almost exclusively with forms post-dating those dealt with in this work. Nevertheless, she surveys a wide area from Europe to Western Asia, and her typology is constructed based on arrowhead features. The basic types are based on the section of the arrowhead.

Type	Description
A	Square section (bodkin) with tang
B	Rhomboid section with tang
C I	Trilobate with socket
C II	Triangular trilobate with socket
D	Leaf-shaped (bilobate) with socket

Figure 9.4: Typology of "Marathon arrowheads," after Erdmann 1973, p. 32.

Further sub-categories are used to classify additional variations in form. Some of these features used to classify types are rather arbitrary, however, such as the distinct types for socketed bilobates with various lengths of socket (DIIc1 - DIIc5).[45] Nevertheless, it is on the whole an effective use of distinct features to create an objective typology.

[44] see Erdmann 1973
[45] Erdmann 1973, p. 49

9.4.7. Medieval Europe

A valuable tool for comparison is the typology of 10th-16th Century AD arrowheads from the British Isles created by Oliver Jessop.[46] A notable (and highly debatable) feature of this typology is that it breaks arrowhead types down by their presumed function: military, hunting, and multi-purpose.[47] Tanged arrowheads, however, are relegated to a separate category of their own regardless of their function, as they are comparatively rare in the time period covered in the work.[48]

9.5. Features significant for typology

I have elected to create a typology based as much as possible on the presence or absence of distinct physical characteristics (such as stops, barbs, etc. as discussed in §6.1) rather than relative criteria in order to remove as much subjectivity as possible in assigning type designations to arrowheads. For many types of early 1st Millennium BC arrowheads, there is a great deal of natural variation in the form of the blades. Therefore, saying that an arrowhead where the greatest width of the blade is farther down is leaf-shaped, but in the middle is ovoid is rather arbitrary. If both have a leaf-shaped blade with a lenticular section and an unstopped tang, however, then they share the same distinct essential features, and are typologically identical.

For the most basic structure of the typology, I used the most important features, which are the method of affixing the arrowhead to the shaft (tang or socket) as well as the basic form of the blade in view of the number of cutting edges it possesses: bodkin, bilobate, trilobate, quadrilobate, and "leaf-shaped" arrowheads, that is, flat arrowheads with two edges. Needless to say, there is some overlap between the latter and the bilobates, however I have kept them in separate categories since socketed bilobates clearly derive from a different tradition than the tanged leaf-shaped arrowheads long used in the Near East. These categories divide the arrowheads into their most basic shapes, many of which are then modified by features that can appear on more than one basic type.

I have assigned the numbers of the first 4 basic types to serve as a mnemonic device. Bodkins have no cutting edges, only a single point, therefore are Type 1. Bilobates, Type 2, have two cutting edges, while Type 3 trilobates have 3 and quadrilobates have 4. In order to keep separate types for bilobates and other 2-edged arrowheads, however, I have assigned other numbers to further 2-edged types. Several kinds of unconventional arrowhead-like objects which do not fit under the above categories

[46] Jessop 1996
[47] Jessop 1996, p. 195
[48] Jessop 1996, pp. 193-195

are covered by Types 6 through 8, and arrowheads (or arrowhead-like objects) made of bone and stone comprise the final two types, Types 9-10.

There are three separate matrices of characteristics, one for the bodkins, one for the bilobates, trilobates and quadrilobates together, and another for all the leaf-shaped arrowheads. Each of these three groups share characteristics that tend to be common to them and not to other groups. For example, a Type 5 leaf-shaped arrowhead cannot have the square section that a bodkin can have, and bilobates, trilobate and quadrilobates all sometimes possess hooks.

Finer distinctions are made by additional features, often in combination, such as stopped tangs together with barbs, which can be found in arrowheads with lenticular, rhomboid or ribbed sections. It should be noted that this typology is constructed to allow types to be assigned to all possible combinations of these features, however not all such combinations are attested. Only attested forms will be discussed here.

Comparisons of arrowhead length are based on the length of the blade rather than the length of the complete artifact. Tangs can vary greatly in their length, and thinner tangs are often broken, thus a more reliable datum for comparison is blade length. Arrowheads that have a significant portion of the tip broken off (indicated in the appendices by an asterix following the blade length) are dealt with separately, since if their blade lengths were included, it would necessarily make the average lengths artificially low.

For arrowhead types with five or more attested unbroken examples, a chart showing the relative blade length of each attested arrowhead is provided. Textual sources indicate that arrows were classified, at least in part, based on weight.[49] Whether relative length was also used as a factor to classify arrowhead is unknown, yet because the heavier an arrowhead is, the larger and longer it tends to be, blade length may also be viewed as a rough approximation of arrowhead weight. Since weights of arrowheads are only available for a small number of sites (and even in those cases, the heavy corrosion of most examples had somewhat altered their original weight), I have provided these charts to allow a comparison of arrowheads with complete blades from all sites in order to help determine if they fall into any distinct groupings by length (which may also help to identify javelin heads versus arrowheads; see §6.5).

Note that all arrowheads illustrated in this section are 1:1 scale unless otherwise stated, and hypothetical sections are offered for arrowheads whose sources lack section drawings.

[49] Miller et al 1986, p. 189

Type Charts

9.5.1. Basic types

1 – bodkins	**7** – double headed
2 – bilobate	**a**) blades aligned, rounded shoulders
3 – trilobate	**b**) blades aligned, barbed shoulders
4 – quadrilobate	**c**) blades offset by 90º, rounded shoulders
5 – leaf-shaped w/tang	**d**) blades offset by 90º, barbed shoulders
6 – forked	**8** – compound blade w/twisted tang
	9 – bone
	10 – stone

Figure 9.5: basic arrowhead types.

9.5.2. Type 1: bodkins

Type 1 designations are formed thus:

1 + (SECTION) + (BLADE & TANG)

#	Section	#	Blade & Tang
a	round	**1**	unstopped
b	triangular	**2**	stopped
c	square	**3**	thin stop
d	rectangular	**4**	bulbous stop
		5	rounded shaft and stop
		6	edge fullers and stop
		7	short blade and stop
		8	ferrule w/short tang

Figure 9.6: Formation of Type 1 (bodkin).

Examples

1a-2 = round stopped bodkin (e.g. Ayanis 3)

1a-3 = round bodkin with thin stop (e.g. Toprakkale 21)

1a-8 = ferrule-like object (e.g. Nimrud 263)

1c-5 = square bodkin with rounded portion above stopped tang (e.g.Toprakkale 18)

9.5.3. Types 2-4: bilobates, trilobates, and quadrilobates

Type 2 to 4 designations are formed thus:

(EDGES) + (CONNECTOR/SHOULDER/TIP)

#	Edges	#	Connector	Shoulder	Tip
2	bilobate	**1**	short socket	round	normal
3a	trilobate	**2**	long socket	round	normal
3b	triangular trilobate	**3**	hooked socket	round	normal
3c	quarrel head	**4**	short socket	angled	normal
4	quadrilobate	**5**	long socket	angled	normal
		6	hooked socket	angled	normal
		7	short socket	concave	normal
		8	long socket	concave	normal
		9	hooked socket	concave	normal
		10	short socket	squared	normal
		11	long socket	squared	normal
		12	hooked socket	squared	normal
		13	short socket	barbed	normal
		14	long socket	barbed	normal
		15	hooked socket	barbed	normal
		16	unstopped tang	round	normal
		17	stopped tang	round	normal
		18	stopped tang w/hook	round	normal
		19	unstopped tang	barbed	normal
		20	stopped tang	barbed	normal

Figure 9.7: Formation of Types 2-4 (bilibates, trilobates, and quadrilobates).

Examples

3a-2 = trilobate with long socket and no hook (e.g. Carchemish 17)

2-1 = bilobate with no hook (e.g. Ayanis 100)

2-3 = hooked bilobate (e.g. Carchemish 5)

3b-4 = triangular trilobate (e.g. Gerar 37)

Also note that the triangular trilobates and quarrel heads are essentially bodkins, in that they do not have sharp cutting edges, but they are clearly closely related to the other socketed bronze arrowheads, so included with them.

9.5.4. Type 5: leaf-shaped arrowheads with tangs

Type 5 designations are formed thus:

5 + (SECTION/STOP) + (SHOULDER/BLADE)

#	Section	Stop	#	Section	Stop
a	lenticular	unstopped	**n**	flattened rhomboid	double stop
b	lenticular	stopped	**o**	flattened rhomboid	wide stop
c	lenticular	bulbous stop	**p**	ribbed	unstopped
d	lenticular	double stop	**q**	ribbed	stopped
e	lenticular	wide stop	**r**	ribbed	bulbous stop
f	rhomboid	unstopped	**s**	ribbed	double stop
g	rhomboid	stopped	**t**	ribbed	wide stop
h	rhomboid	bulbous stop	**u**	flattened rib	unstopped
i	rhomboid	double stop	**v**	flattened rib	stopped
j	rhomboid	wide stop	**w**	flattened rib	bulbous stop
k	flattened rhomboid	unstopped	**x**	flattened rib	double stop
l	flattened rhomboid	stopped	**y**	flattened rib	wide stop
m	flattened rhomboid	bulbous stop	**z**	lenticular w/recessed edge	double stop

Figure 9.8: Section/stop designations for Type 5.

#	Shoulder	Blade	#	Shoulder	Blade
1	round	normal	**30**	concave	ogee
2	angled	normal	**31**	squared	ogee
3	concave	normal	**32**	barbed	ogee
4	squared	normal	**33**	double barbed	ogee
5	barbed	normal	**34**	crescentic swallowtail	ogee
6	double barbed	normal	**35**	swallowtail	ogee
7	crescentic swallowtail	normal	**36**	concave swallowtail	ogee
8	swallowtail	normal	**37**	round	extended ogee
9	concave swallowtail	normal	**38**	round	pentagonal
10	round	long	**39**	angled	pentagonal
11	angled	long	**40**	concave	pentagonal
12	concave	long	**41**	squared	pentagonal
13	squared	long	**42**	barbed	pentagonal
14	barbed	long	**43**	double barbed	pentagonal
15	double barbed	long	**44**	crescentic swallowtail	pentagonal
16	crescentic swallowtail	long	**45**	swallowtail	pentagonal
17	swallowtail	long	**46**	concave swallowtail	pentagonal
18	concave swallowtail	long	**47**	round	rounded
19	round	triangular	**48**	angled	rounded
20	angled	triangular	**49**	concave	rounded
21	concave	triangular	**50**	squared	rounded
22	squared	triangular	**51**	barbed	rounded
23	barbed	triangular	**52**	double barbed	rounded
24	double barbed	triangular	**53**	crescentic swallowtail	rounded
25	crescentic swallowtail	triangular	**54**	swallowtail	rounded
26	swallowtail	triangular	**55**	concave swallowtail	rounded
27	concave swallowtail	triangular	**56**	angled	chisel
28	round	ogee	**57**	concave	chisel
29	angled	ogee	**58**	squared	chisel

Figure 9.9: Shoulder/blade designations for Type 5.

Examples

5a-1 = lenticular leaf-shaped w/unstopped tang (e.g. Nimrud 42)

5e-57 = lenticular chisel w/concave shoulders and unstopped tang (e.g. Toprakkale 17)

5q-5 = ribbed leaf w/barbed shoulders & stopped tang (e.g. Marlik 20)

5z-14 = long leaf w/recessed edge, barbed shouders and double stop (e.g. Ayanis 89)

9.6. Type 1 – BODKINS

Bodkins are arrowhead that posses a point but no cutting edges. They are designed to maximize the ability of the arrow to penetrate the target. Edged arrowheads are intended to open cuts in the target and cause bleeding; because the bodkin lacks cutting edges, it produces a comparably small wound compared to other arrowheads of similar mass.

As a number of authors have observed, bodkins were primarily armor-piercing weapons.[50] In the later European Middle Ages, bodkins were the standard combat arrowhead due to the considerable amounts of steel armor being worn on battlefields of the time.[51] In the ancient Near East, armor use was certainly not as widespread as in later periods, but both iconographic sources and archaeological finds make clear that at least some soldiers wore helmets and body armor of bronze or iron, and possibly also of leather or reinforced fabric, thus necessitating arrowheads capable of penetrating armor.

Bodkins have either circular or square/rectangular sections. Bodkins with triangular sections are not attested, though socketed bronze arrowheads with triangular sections are (triangular trilobates, see §9.10). The lack of this form of arrowhead is certainly due to the difficulty of forging a triangular section compared to a round or squared section. A round bodkin could be rolled as it was hammered, and the parallel flat faces of a square bodkin would be easy to form by simply rotating the bodkin 90 degrees while hammering the faces flat. Each flat face of a triangular bodkin has an edge opposite it, so hammering the face flat would have flattened the edge opposite unless special equipment (such as a swage block) was used. Though they have 3 sides, triangular trilobates avoid this complication by being cast rather than forged.

[50] for example, see Rothenberg 1975, p. 79, or Petrie 1928, p. 15
[51] see Jessop 1996

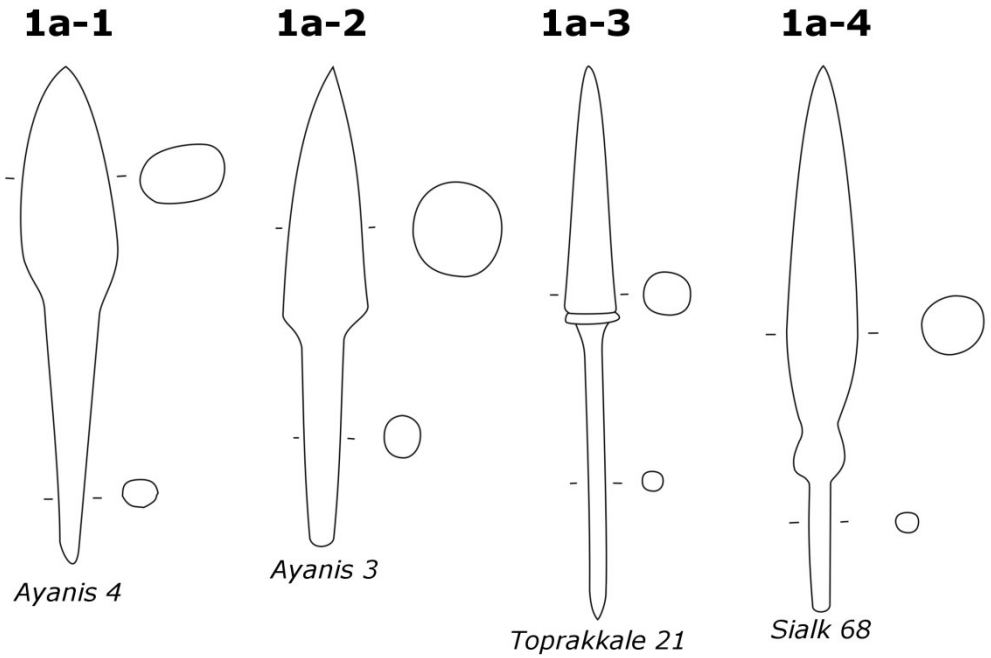

Figure 9.10: Types 1a-1 to 1a-4.

9.6.1. 1a-1 - round bodkin w/unstopped tang

One of the simplest bodkins, Type 1a-1 points have a circular section and generally taper towards both ends. Some examples have little or no clear separation between the tang and the point itself, while others have a gentle compound curve approximating rounded shoulders in leaf-shaped arrowheads. The identification of round bodkins can be difficult since pointed cylindrical objects are not uncommon. Some tools, such as punches or awls, may appear very similar, if not identical, to round bodkins. Several of those listed here are ambiguous. Both Gerar 89 and Lachish 3 appear to have tangs, but if that is the case, they have been broken off short and bent somewhat to the side. It could be the result of impact damage and subsequent corrosion, though it could also indicate that they served a completely different function. Gerar 87 appears to lack a tang, though it could have broken off and then corrosion masked the fractured area. Both Gerar 92 and Gerar 90 have only stubs on their bottom ends, which could be broken tangs. Lachish 137, 180 and 181 all may have had distinct tangs, yet their poor state of preservation makes it difficult to be certain.

Type 1a-1 bodkins are attested throughout the early 1st Millennium BC and are found over a wide geographical area. Nevertheless, it is worth noting that over half of the examples come from the Levant (Gerar and Lachish), indicating that this area was where round bodkins were most heavily used.

Type 1a-1 bodkins come in three distinct sizes. The smallest, Ayanis 4 & 2, have blades of 3.3 and 3.4 cm, respectively. The second group, from Gerar and Lachish, are slightly larger than the first, with blades of 4.6 to 6.6 cm. The remaining three are much larger, 10.0 to 11.1 cm, also from Gerar and Lachish. The two sizes suggest that round bodkins may have been differentiated by weight into at least two categories, akin to the arrowheads mentioned in a text from Mari.[52]

All examples of Type 1a-1s are made of iron. This is perhaps due to the ease with which this form of arrowhead could have been forged, as well as the fact that if one was going to take the trouble to make a mould, it would be easy enough to make the mold for a more effective stopped variety (as indicated by stopped round bodkins cast in bronze; see §9.6.2).

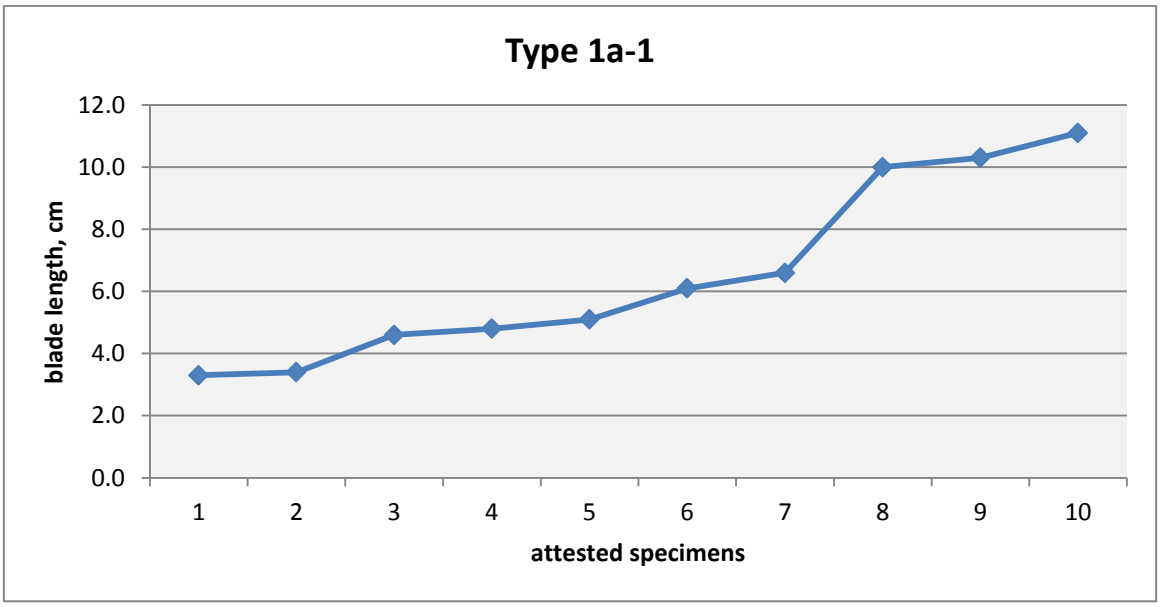

Figure 9.11: Sizes of Type 1a-1 arrowheads.

9.6.2. 1a-2 - round bodkin w/stopped tang

The difference in diameter of the tange of a Type 1a-2 bodkin and the base of its cone-shaped point creates a stop for the arrow shaft to rest against. Most examples have a very distinct stop (e.g. Gerar 1), though the stops of several of the larger arrowheads are somewhat tapered rather than completely flat. Though a tapered stop would likely not be as effective as a flat stop, it is also attested on numerous leaf-shaped arrowheads (e.g. the Type 5b-1 Nimrud 10 and the Type 5q-1 Lachish 365).

Like Type 1a-1, Type 1a-2 bodkins appear to come in more than one distinct size. The smaller group, with blades from 2.4 to 4.5 cm, is very uniform in both shape and size. The considerably larger second group, with blades from 5.8 to 9.8 cm, is more varied. Sialk 3, 2 and 1 are very similar, with

[52] Miller *et al* 1986, p. 189

thick, heavy blades. Hasanlu 48, Gerar 88 and Lachish 135, by contrast, are extremely thin relative to their length. They would have been much lighter projectiles than those from Sialk, though it also has a much smaller cross-section which may have aided in penetration of the target. Thus, the smaller Type 1a-2s constitute a homogenous type attested across the Near East (Sialk, Gerar, and Ayanis), while the larger types may have been regional developments. Nearly half of the Type 1a-2s (7 of 15) were found in burials, however as these all come from Sialk, this high proportion merely reflects their frequency in the cemetery of Sialk rather than a general depositional trend.

The majority of Type 1a-2s are iron (10 examples), while only four are bronze (and one from Sialk of unknown composition). Bronze examples are concentrated in the larger, more heterogenous, group of Type 1a-2s (3 of 7). Gerar 1 is the only small Type 1a-2 that is certainly made of bronze, yet its form is virtually identical to the other iron Type 1a-2s. Thus, if the small Type 1a-2s constitute an emic type, material is one of the variable factors (see §9.17).

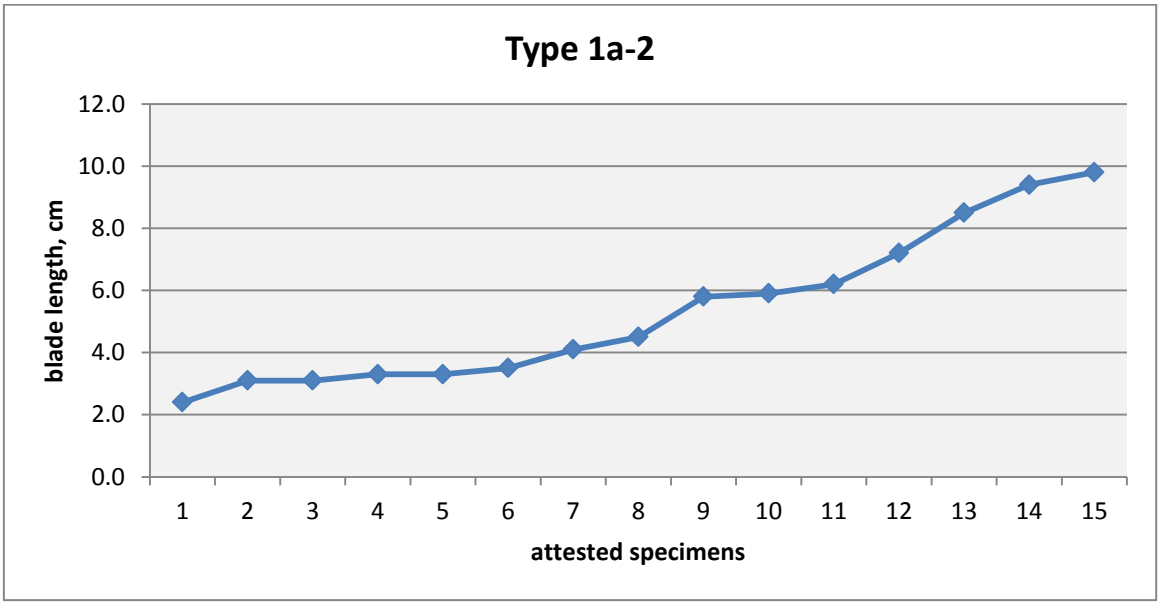

Figure 9.12: Sizes of Type 1a-2 arrowheads.

9.6.3. 1a-3 – round bodkin w/thin stop on tang

A rare variation on the round bodkin, there are only two examples from the sites surveyed in this work (Toprakkale 21 and the badly damaged Nush-i Jan 6). A thin groove was scribed around the point of the arrowhead only about 1 mm from its base, just before the much narrower tang begins. This gives the appearance of a stop of sorts, though the "stop" is just as wide as the lower part of the point. Therefore, it likely had no functional purpose, but rather served as decoration, helping to visually delineate the bottom of the blade.

The two examples of this type come from widely-separated sites. Both are made of iron, and while the Toprakkale example is much longer than that from Nush-i Jan, the latter would likely have been of a more comparable length before the tang and tip of both broke or corroded off. Therefore, it would appear that Type 1a-3 bodkins were a consistent, standardized form over a considerable area, from Transcaucasia to Northwet Iran.

9.6.4. 1a-4 – round bodkin w/bulbous stop on tang

While Type 1a-2 forms a stop by the difference in diameter of the point and the tang, Type 1a-4 bodkins have a separate and distinct bulbous stop. This bulbous stop is wider than the blade itself on Sialk 67, which may have been intended to allow a thicker (and therefore heavier) shaft to be mounted to it. However the stops of the other Type 1a-4s are not wider than the widest part of the blade. The primary purpose of the bulbous stop in these cases must be aesthetic, perhaps to make them resemble leaf-shaped arorwheads with stops, such as Type 5b-1.

Nearly all the Type 1a-4 points come from Sialk, with only one other (and perhaps a second) from Gerar. The blades range from 2.9 to 7.4 cm, and they are a mixture of bronze and iron, with two of unknown metal. As with the Type 1a-2 bodkins, they are primarily attested in burials since the majority of the examples (4 of 6) are from Sialk.

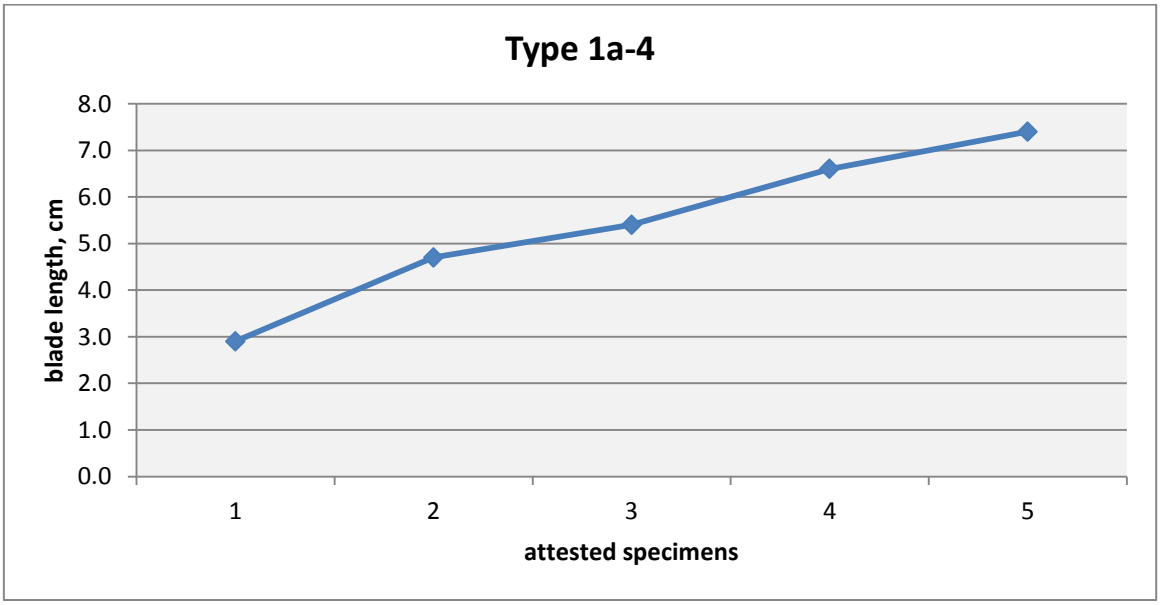

Figure 9.13: Sizes of Type 1a-4 arrowheads.

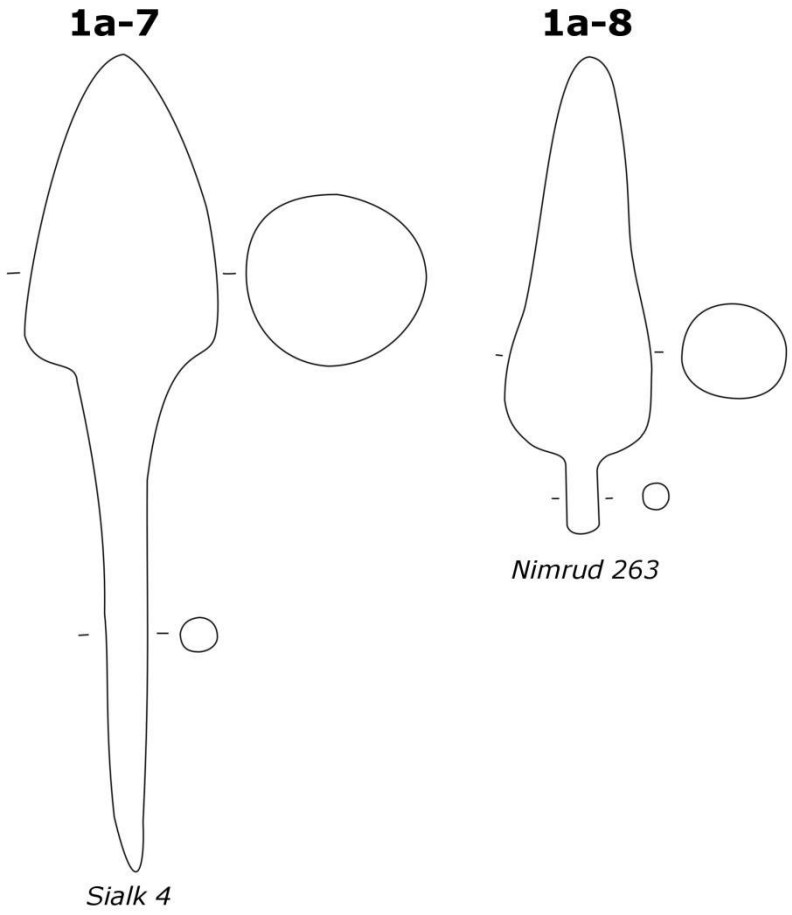

Figure 9.14: Types 1a-7 to 1a-8.

9.6.5. 1a-7 – short round bodkin ("stunning bolt")

This form of bodkin is unusual in that they are proportionally very short in relation to their width, and also exhibit a slightly curved profile. The width of this form of point makes it far less suited to penetrating a target as there would be much greater resistance relative to the weight of the arrowhead than there would be for a conventional bodkin. It is therefore possible that they were not intended to penetrate their targets at all, or at least not significantly. Genz identifies these kind of points, along with ones that have completely blunt ends, as stunning bolts.[53] Their purpose was to knock birds out of the air without actually killing or significantly damaging them.

All four examples come from Sialk, are made of bronze, and have remarkably consistent blade sizes, from 4.4 to 4.5 cm, with one broken example which appears to likely have corresponded to the others when it was whole. While two, Sialk 6 & 5, have broken tangs, their great similarity in all other respects to the other two indicate that their tangs were most likely originally quite long as well.

[53] Genz 2007

Indeed, they have been deliberately made to not only have a similar shape, but also to have nearly identical weights (the consistency of which which would aid accurate long-range shooting).

9.6.6. 1a-8 – ferrule-type bodkin

Ferrule-type bodkins are very peculiar for projectile points, and may in fact have served a completely different purpose. They have a gently curving profile, like a leaf-shaped arrowhead, but with a round section and a fairly blunt point (though the blunt points may also be the result of corrosion). All three of the examples also exhibit remarkably short tangs. Indeed, they are so vestigal that it is difficult to see how they could have effectively fastened the points to an arrow shaft.

It is, of course, possible that they were bodkin arrowheads, however the blunt points and extremely short tangs suggest that some other purpose was more likely. They might have served as ferrules, which would have protected the blunt end of a spear and also served as a counterweight. However, there are more probable examples of ferrules from Nineveh, which have a more conventional shape (cone-shaped socket and a small but sharp point).[54] Likewise, they may have been counterweights used on javelins. Such counterweights would not need to be sharp, and since they would only have to withstand the forces of acceleration (that produced by the individual throwing the javelin) and not the forces of impact (where it would rest against the end of the shaft). The 'ferrules' could also be some kind of tool, though with such a short tang, it is difficult to imagine their function.

Despite being distributed over a wide area (Gerar, Toprakkale, and Nimrud), Type 1a-8s are reasonably consistent in their size, shape, and material (all are made of iron), which suggests that whatever purpose they were for, they all belonged to a distinct, well-defined and widespread form.

[54] Stronach 1958, p. 170 & pl. 32:9

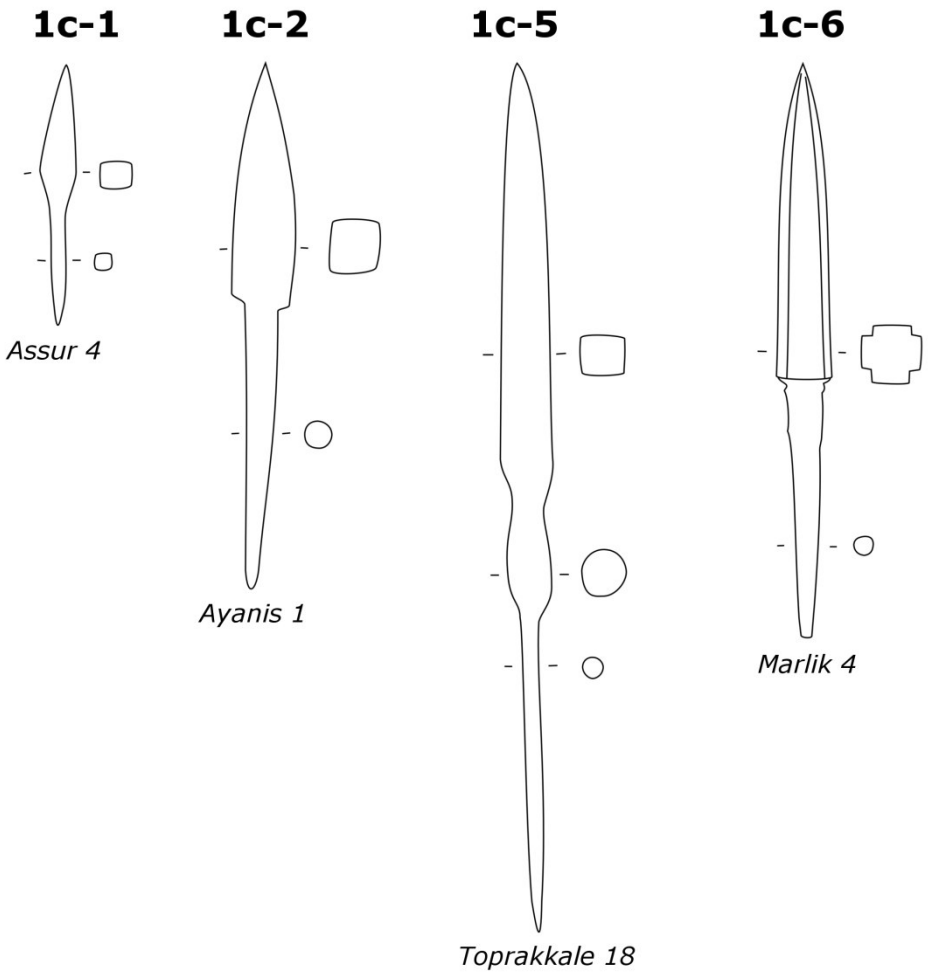

Figure 9.15: Types 1c-1 to 1c-6.

9.6.7. 1c-1 – square bodkin w/unstopped tang

Square bodkins have a distinct advantage over triangular and round arrowheads in that they were probably easier to manufacture. The flat, parallel faces of the blade allow easy forging – simply rotating it 90 degrees while hammering it on an anvil. Furthermore, the flat surfaces of square bodkins would have also been easier to carve into molds for casting in bronze than the curved surfaces of round bodkins.

Type 1c-1 bodkins have square sections but no clear division between stop and tang – they taper towards both ends. This perhaps represents the easiest form of bodkin to make, and therefore the most amenable to mass production.

The 22 Type 1c-1 bodkins mostly fall into two clearly defined sizes. Four small examples have blades between 1.0 to 1.7 cm, and a further five have blades from 3.3 to 6.3 cm. The shorter examples all come from Assur and Uruk, and they are very consistent in terms of size, material (all are bronze)

and shape, with angled shoulders leading to clearly-defined tangs. Assur 50 and 51 cannot be dated, but have been included since they clearly resemble both Assur 4 (which was found in a burial dated to the Neo-Assyrian Period[55]) and the Neo-Babylonian Uruk 12. Thus, the small Type 1c-1 bronze bodkins appear to be a distinct type employed in Northern and Southern Iraq in the early 1st Millennium BC, though similar finds from both Boğazköy[56] and Norşuntepe[57] indicate that this form had been in use in central and eastern Anatolia in the 3rd and 2nd Millennia BC at least (see Figure 9.16 and Figure 9.17). While these small 1c-1s may have well have been intended as light arrowheads for long-range shooting,[58] they may also have served as tools. Boehmer identified most of the examples from Boğazkoy as awls.[59]

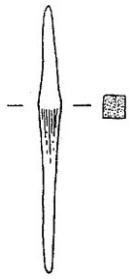

Figure 9.16: An undated Type 1c-1 from Boğazköy; after Boehmer 1972, pl. 32, no. 953A (not to scale).

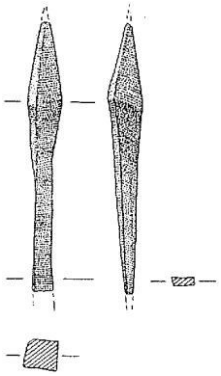

Figure 9.17: A Type 1c-1 from Norşuntepe, dating from the 3rd to 2nd Millennium BC; after Schmidt, K. 2002, pl. 42, no. 605 (not to scale).

The six larger examples are more heterogenous in shape, some with clearly distinct tangs and others where they simply taper to both ends (in which case only the upper tapered area is considered the blade here). They cover a greater size range, with blades from 3.3 to 6.3 cm (not including the broken Gerar 14), yet they are all similar in that they are all made of iron and come principally from the Levant (the one exception being Hasanlu 51). Thus, while large iron type 1c-1s appear to have been favored in the Levant, the variation in their forms suggest that they did not conform to a single specific ideal.

[55] Haller 1954, p. 28
[56] Boehmer 1972, nos. 883, 938, 939, 945, 947, 953, 959-970; Boehmer 1979, nos. 3198, 3203, 3205, 3217, 3218, 3220-3222, 3229, 3234, 3235, 3256-3258
[57] Schmidt, K. 2002, pp. 51-52, pl. 48, nos. 599-608
[58] Schmidt, K. 2002, p. 51
[59] Boehmer 1972, nos. 936-992, 1619-1624A; Boehmer 1979, nos. 3189-3332, 3488-3490; Boehmer did acknowledge that some of these awl-like objects may have been used as arrowheads for hunting birds and small animals; Boehmer 1972, p. 115.

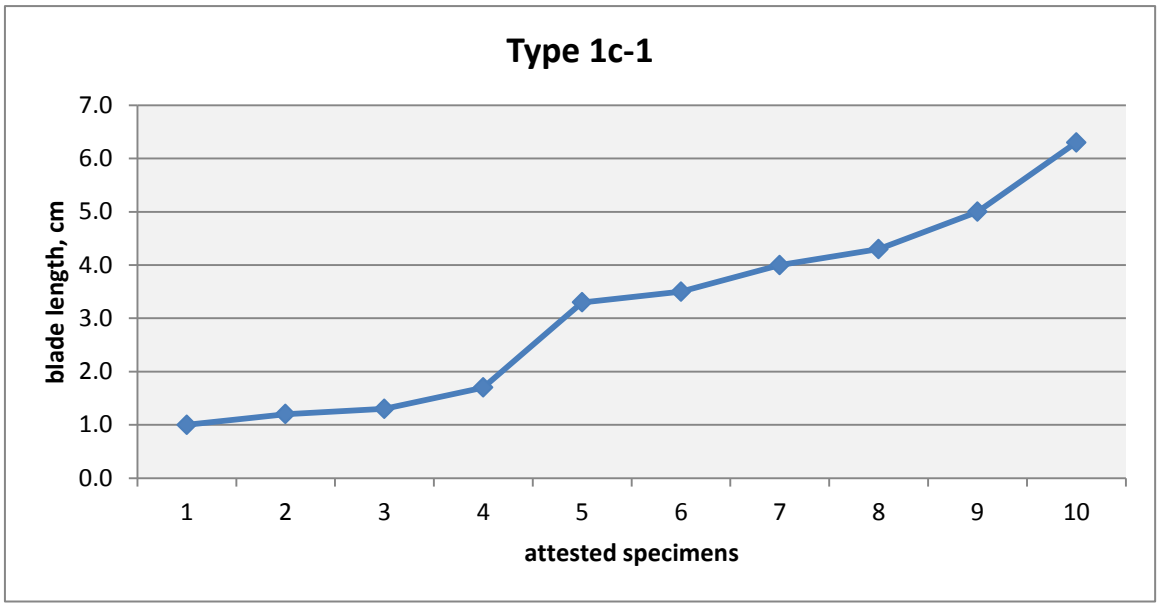

Figure 9.18: Sizes of Type 1c-1 arrowheads.

9.6.8. 1c-2 – square bodkin w/stopped tang

Like Type 1a-2, Type 1c-2 bodkins form their stop by the difference in width of the blade versus the tang forming a more or less flat surface for the arrow shaft to rest against. Type 1c-2s are attested across a broad range of sites and cover a wide range of sizes, though those found at each individual site tend to be remarkably similar to one another. The 3 examples from Sialk are all very small, from 1.0 to 1.3 cm, those from Transcaucasia from 3.0 to 3.5 (with the Ayanis examples on the smaller side and the Toprakkale examples on the larger side). Those from Gerar are 4.9 to 6.0 cm long but those from Lachish cover a greater range of sizes, from 3.3 to 7.2 cm. This distribution is markedly regional – small examples in the east, large in the west, and in Transcaucasia, mixed medium and large. The majority are iron, except the largest example, from Ayanis, which is made of bronze. The material of which the three small examples from Sialk are made is unfortunately not stated explicitly in the excavation report. The Sialk and Hasanlu examples could be the oldest, though the possible date range for those from Sialk does overlap with those from Transcaucasia. Unfortunately, no date can be assigned to those from Gerar, however those from Lachish date from the latter half of the early 1st Millennium.

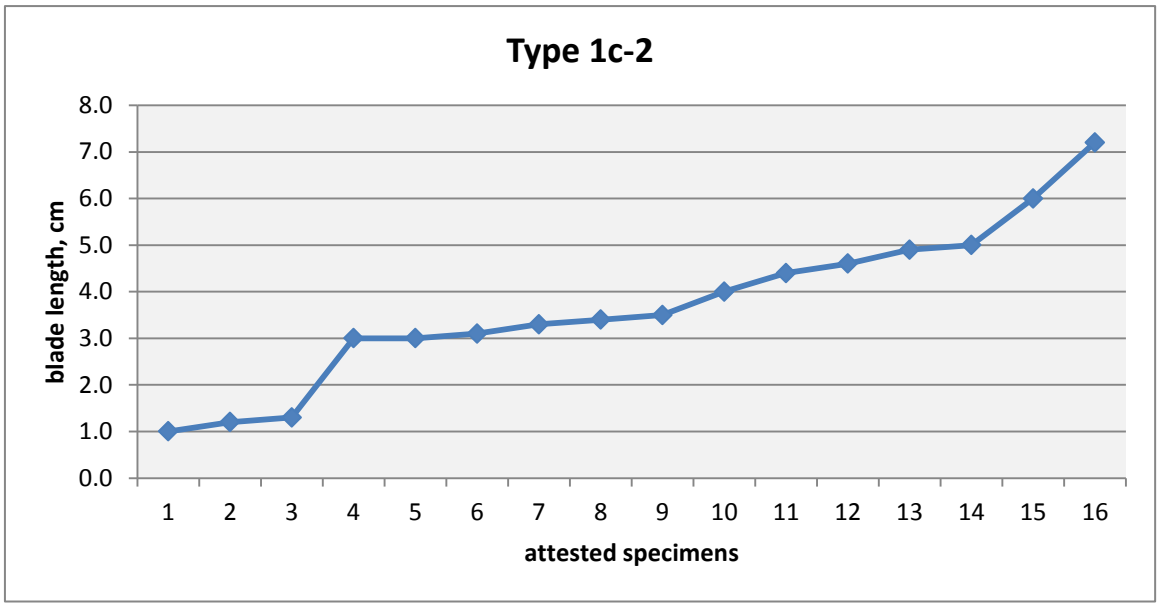

Figure 9.19: Sizes of Type 1c-2 arrowheads.

9.6.9. 1c-5 – square bodkin w/rounded stem

The sole example of a Type 1c-5 is Toprakkale 18, an iron bodkin with a 7.0 cm blade.[60] It is essentially identical to a Type 1c-2, however a portion of the blade just above the tang is rounded. As the rounded portion is never wider than the plane of the squared faces, it was either drawn out during forging or the squared corners were filed off after it was made. There is no indication of the purpose of the rounded stem area, except perhaps to resemble the stem of a leaf-shaped arrowhead.

9.6.10. 1c-6 – square bodkin w/fullers and a tang

One example of this type of point was found at Marlik, though similar objects appear at a number of other sites in Iran dating to the late 2nd to early 1st Millennium[61] and one similar example comes from Tell Halaf and is dated to the 2nd half of the 1st Millennium BC.[62] Negahban refers to it as "pyramidal,"[63] however the faces of the blade have a gentle curve along the vertical axis rather than being flat planes. Each of the four edges of the blade has been replaced by a groove running the full length of the blade, resulting in a cross-shaped section. The purpose of these grooves or fullers is ambiguous. Grooves in blades were often intended to lighten a blade without detracting from its strength, as is the case with fullers on swords. However, this form of arrowhead was clearly designed with maximizing penetration in mind, and thus it is unlikely that a reduction in weight would have been desired (and the weight reduced would have been minimal, since the grooves are very narrow).

[60] There may have been additional examples from Toprakkale, as hundreds of iron arrowheads were found there, however Wartke only published one example in order to illustrate his typology. See Wartke 1990, p. 126
[61] Negahban 1996, p. 277
[62] von Oppenheim & Hrouda 1962, no. 143, p. 50, pl. 36
[63] Negahban 1996, p. 277

The grooves could possibly have been intended instead to facilitate bleeding even if the arrowhead was left in place, as well as creating a more irregular wound that would be more difficult to treat.

9.7. Type 2 – BILOBATES

Bilobate arrowheads consist of two blades ("lobes") projecting from either side of socket with generally extends the full length of the arrowhead. The actual cavity for the arrow shaft normally only occupies the lower portion of the socket, leaving the upper portion solid metal. Thus, the socket not only provides the attachment to the shaft, but also a backbone to the arrowhead which increases its rigidity in precisely the same manner as a rib.

Virtually all socketed bilobates were cast in bronze. However, the earliest socketed bilobates attested in the near east (dating to the 8th Century BC at Hasanlu) were forged from iron.[64] Presumably, the local populations in northwest Iran had recently been exposed to socketed bronze arrowheads produced by nomadic populations from the north (though whether this exposure was indirect, via trade, or direct via conflict cannot be determined; see §7.3). Thus the socketed iron arrowheads most likely represent attempts by these local populations to adapt this new form of arrowhead to their preferred material for arrowhead production, iron. Such experimentation was not limited to Hasanlu, as a futher socketed iron bilobate is attested at Toprakkale (Toprakkale 15), though it is later in date than the Hasanlu examples (mid 7th C. BC).[65]

The strong preference for bronze in the manufacture of bilobates is due to the challenges involved in forming arrowhead sockets. Such sockets could be cast in bronze fairly easily, though a rather complex mold is required (two halves divided down the vertical axis, plus a plug piece for the socket; see §6.3.3.4). However, only a single skilled craftsman was required to make the mold, and then numerous castings could be made from it by less skilled individuals. Forging a small socket in iron would have required a skilled smith and a considerable expenditure of effort, which must be repeated for each individual arrowhead. If the socket was replaced with a tang to make the job easier, then one may as well make one of the normal leaf-shaped arrowhead varieties. Because of these complications, socketed iron arrowheads did not proliferate as socketed bronze arrowheads did.

The blades of bilobates were sometimes comparatively thick (which would have aided the casting process), and were often filed to sharpen edges after casting.[66] The sharp lines this filing produces are

[64] Thornton & Pigott 2011, p. 143, fig. 6.4
[65] Toprakkale 335; see Wartke 1990, p. 128. Note that this particular arrowhead also had a rib forged into it, making it certain that it was a copy in iron of the more common bronze arrowheads.
[66] For clear examples of such sharpening, see Wartke 1990, p. 60.

often reproduced in illustrations of bilobates in archaeological publications, giving them a "cowled" appearance (e.g. Figure 9.20, Types 2-1 and 2-3).[67]

Aside from the iron bilobates from Hasanlu IVB, bronze bilobates (as well as trilobates) are not securely attested in the Near East before the mid 7th Century BC.[68] From shortly after that point, however, they become prolifically attested and remained in use well into the Achaemenid Period.[69]

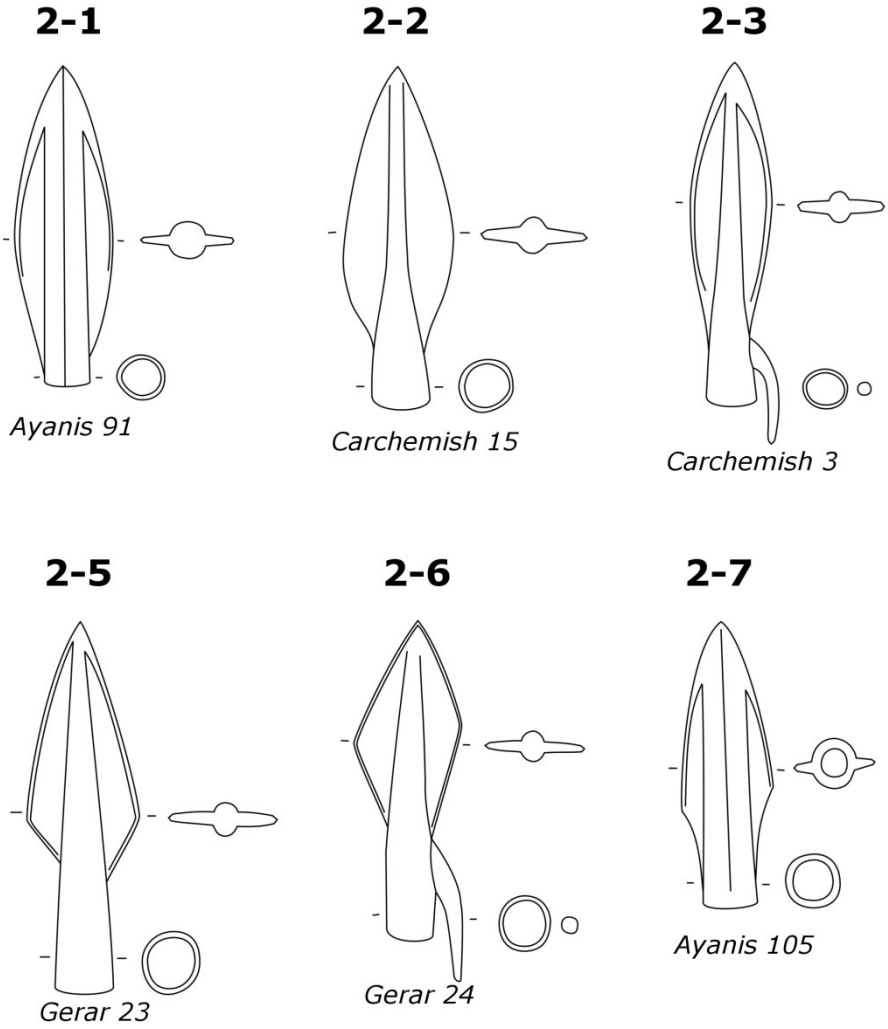

Figure 9.20: Types 2-1 to 2-7.

9.7.1. 2-1 – bilobate w/short socket

Type 2-1 arrowheads are the most basic bilobates, simply a socket and blades. The socket ends flush with the bottom of the blades or sometimes extends slightly below (which appears to be natural variation rather than a significant feature). Type 2-1 points have remarkably consistent blade lengths,

[67] for example, Ayanis 93
[68] Derın & Muscarella 2001, p. 197
[69] Snodgrass 1964, p. 151; Schmidt, E.F. 1957, pl. 76:19-20

with all 17 certain and unbroken examples falling between 3.4 and 4.7 cm. This extremely low standard deviation is particularly remarkable when one considers that these finds were discovered across a wide area. The majority come from Urartian sites (Ayanis and Bastam), however a smaller quantity have been found at Nineveh and Uruk, and one single undatable example from Gerar.

As a group, the Type 2-1s correspond to the full length of both Type 2-2 (3.2 to 4.1 cm long) and Type 2-3 (3.0 to 5.9 cm long). This suggests that a primary characteristic for socketed bilobates was their weight, while a long or short socket, or the inclusion of a hook, were secondary considerations. Having arrowheads (and, presumably, complete arrows) of consistent a weight is an important factor in archery, since it is easier for archers to fire accurately if their arrows all have identical ballistic properties.

The general shape of Type 2-1 arrowheads is also very consistent. The most unusual one is Uruk 17, which has wider, flatter blades. It appears to resemble ribbed leaf-shaped arrowheads, even though it has a socket. This effect is produced by the upper portion of the socket being unusually narrow, and it may have been a deliberate attempt to produce a socketed arrowhead that resembled a ribbed arrowhead. The opposite effect – a tanged arrowhead made to resemble a socketed arrowhead – can be seen in Uruk 14 (Type 5q-2).

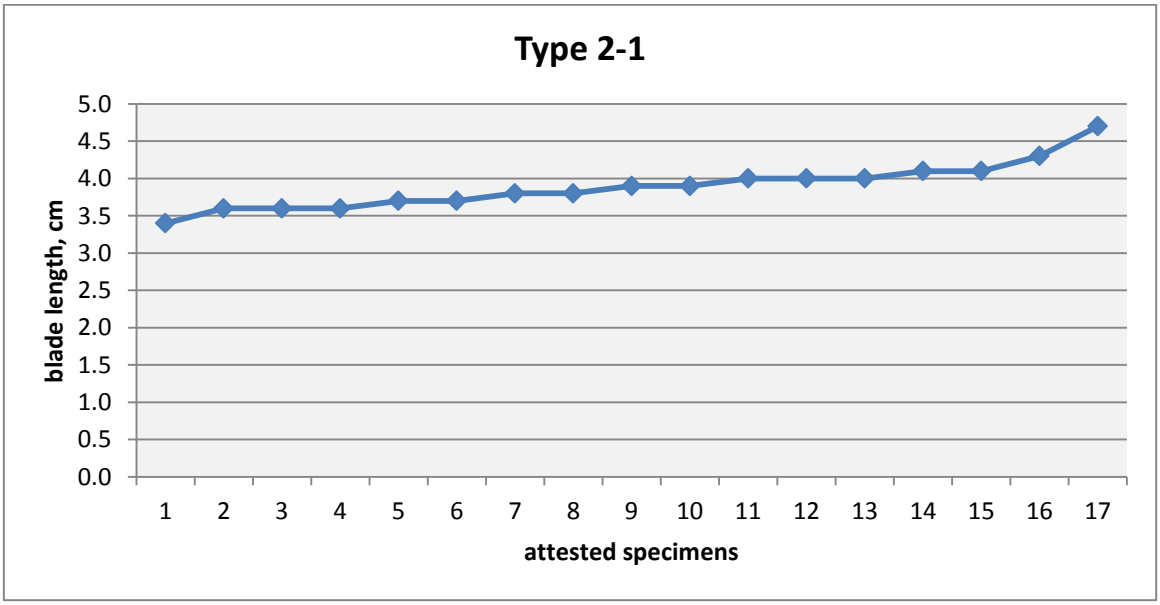

Figure 9.21: Sizes of Type 2-1 arrowheads.

The vast majority of Type 2-1 arrowheads come from Transcaucasian sites, with a smaller quantity from Northern and Southern Iraq. One single undatable example from Gerar comes from outside this

extended region. Regardless of the date of Gerar 26, it seems clear that the primary region in which Type 2-1s were used was from Transcaucasia to Southern Iraq.

It is also worth noting that the vast majority of Type 2-1 arrowheads come from destruction levels of various sites: most are from Ayanis, but one is from Bastam and three from Nineveh. Thus they are heavily represented in destruction levels from the late Neo-Assyrian Period, though this does not necessarily support hypotheses that the presence of these arrowheads proves the presence of Indo-Iranian nomads. Rather, it indicates that socketed bronze arrowheads were in common use at the time the Assyrian Empire collapsed.

9.7.2. 2-2 – bilobate w/long socket

Type 2-2 bilobated have sockets that extend well below the bottom of the blades. These tend to have a less homogenous form than Type 2-1; the shoulders tend to be more pronounced, for example, and meet the socket at a sharper angle rather than gently merging into it as is typical of Type 2-1.

With 19 examples, Type 2-2 is less numerous than Type 2-1. The 17 complete blades range from 2.0 to 6.8 cm long. A comparison of blade lengths suggests three distinct groups (see Figure 9.22). Smaller arrowheads (Gerar 5 to Bastam 3, plus the broken Bastam 15) have blades of 2.0 to 2.9 cm. A medium-sized group (Toprakkale 15 to Bastam 14, plus the broken Ayanis 104) all have blades from 3.5 to 4.1 cm. However, there is no common style that unifies these two groupings. The largest five arrowheads, all iron examples from Hasanlu, have blades of 5.8 to 6.8 cm.

The very smallest examples (Gerar 5 to Bastam 23) are essentially sockets with the merest vestiges of blades. Naturally, a socket cannot be scaled down past a certain point since it still must fit over the tip of a functional arrow shaft. But the blades can be as small as desired, which may have been desirable to make the arrow as light as possible in order to increase its range. Bastam 8 and 3, however, very much resemble the larger Type 2-2s, as well as many Type 2-1s.

Carchemish 15, like Uruk 17 (Type 2-1, see above) has a very narrow upper socket, giving the arrowhead a great resemblance to a ribbed leaf-shaped arrowhead (Type 5p, etc.). Carchemish 15 is also the only Type 2-2 for which the weight is known. At 5.5 grams, it is comparable to Type 2-3 arrowheads, if on the heavy side.

The most exceptional Type 2-2 arrowheads, however, are the several iron examples. The most important are the five examples from Hasanlu, given that they are the earliest attested socketed arrowheads in the Near East, dating to the 8th Century BC. Hasanlu 38, 39 and 37 all have ribs or

ridges running down their centers, perhaps in imitation of cast bronze bilobates, however Hasanlu 36 and 35 both have the lenticular section more common to iron arrowheads. In all cases, it appears that the cavity of the socket does not extend into the blade of the arrowhead as the sockets of bronze arrowheads normally do, instead being completely encased in the socket projecting below the blade. This was most likely a product of the technique used to create the arrowheads (see §6.4.3). If the socket was integral to the blade, it would have to be forged first, and then the blade forged around the socket while, at the same time, not crushing or distorting the socket. It is far simpler to keep the socket as a separate element below the blade, so both could be formed as necessary without distorting the other. The difficulty of forging a small iron socket is doubtless also one of the reasons that these examples are the largest Type 2-2s by a considerable margin.

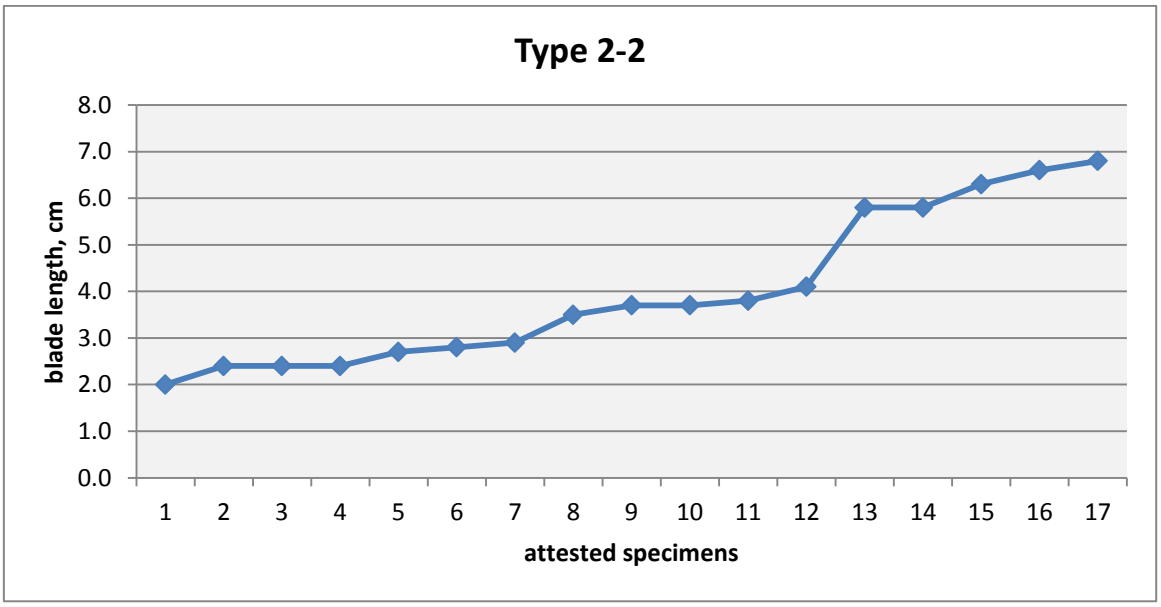

Figure 9.22: Sizes of Type 2-2 arrowheads.

Toprakkale 15, dating to the mid 7th C. BC, appears to be a more deliberate attempt to mimic bronze bilobates in iron. It has a 3.5 cm blade and a clearly defined midrib, and so except for its material, it fits in well with other socketed bronze arrowheads. It is somewhat damaged, so some details of its structure are unclear, however it appears that like the Hasanlu examples, its socket did not extend into the blade itself. The small socket must have been challenging to forge, which is doubtless why this kind of arrowhead is not more widely attested.

Type 2-2 arrowheads are found from the Levant to Iran. Among the sites surveyed, they are absent only in Southern Iraq. The marked similarity of the majority of Type 2-2s to the majority of Type 2-1s indicate that they derived from the same tradition. Though not necessatily manufactured by the same peoples, those who made them clearly shared the same ideal of how the arrowhead should be

formed. The Hasanlu examples may represent the best approximation of the conventional form of socketed bronze arrowheads that could be managed in iron. Only Carchemish 15 appears to have been intended to conform to a different style of arrowhead (ribbed leaf-shaped).

9.7.3. 2-3 – bilobate w/socket and hook

Type 2-3 are essentially identical to Type 2-2, except that a backwards-curving hook has been added to the socket behind one of the blades. Hooks cannot be added to short socket forms, since there is not sufficient room behind the blade to mount the hook. Thus, all hooked arrowheads require a socket that projects at least some length below the blades.

With 34 examples, Type 2-3s are the most common form of bilobate arrowhead among the sites covered by this study. One would assume that this is because a hooked arrowhead would be more effective in creating a disabling wound in its target, in addition to the fact that hooks require only a minor addition to the mold. However their unhooked counterparts are still quite numerous, so hooks must not have been desired in all situations. In form, Type 2-3 bilboates closely follow the conventional form of Type 2-1s, indicating that they derive from the same tradition.

Hooked bilobates range fairly evenly in blade length from 2.0 to 4.2 cm (nearly identical to Type 2-2s), though the smallest three are a bit smaller than one would expect compared to the others. Nevertheless, their form corresponds well with the larger examples.

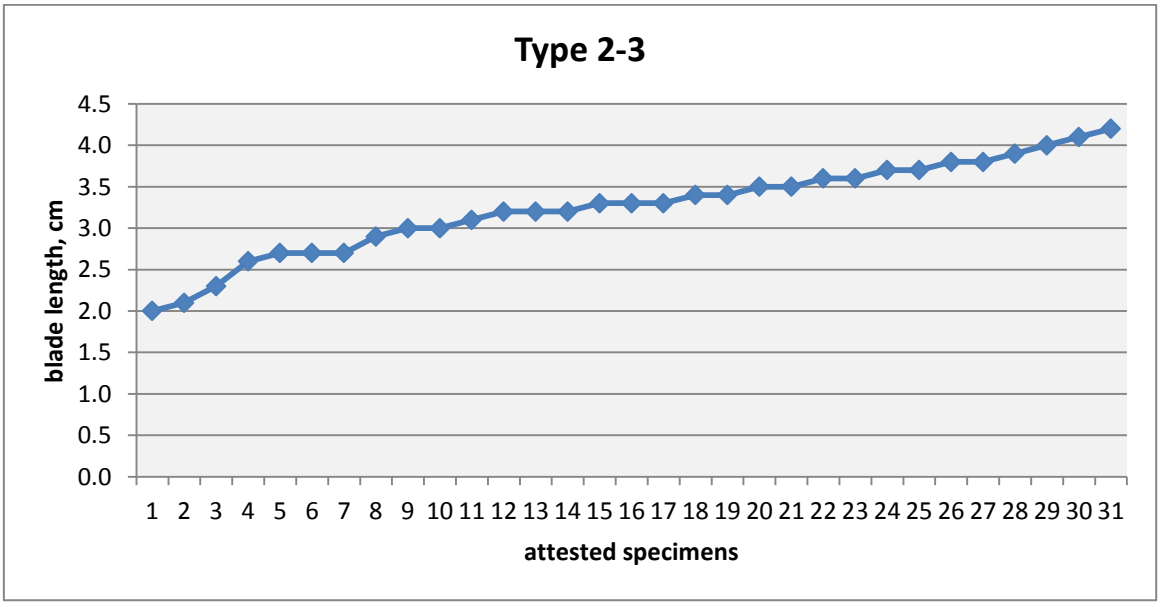

Figure 9.23: Sizes of Type 2-3 arrowheads.

Like Type 2-1, Type 2-3 arrowheads are found, among the sites surveyed, in Transcaucasia, Northern Iraq, Syria and the Levant, though not in Southern Iraq or Iran. The ten largest examples all come from Ayanis, however the fact that several of the smaller examples come from Toprakkale and Bastam argue against this being a regional trend. The earliest example is Bastam 19, dating to roughly 650 BC (and thus one of the earliest socketed bronze arrowheads in the Near East), though the Ayanis examples could also potentially be just as old.

The examples from Nimrud and Carchemish weigh between 4.5 and 5.5 grams. Though they have varying blade lengths, all have an overall length of roughly 5 cm, with the exception of Nimrud 264, which is much shorter, though heavily corroded. Its weight as preserved is already 5.0 grams, so when it was new it likely was heavier even than the 5.5 gram Carchemish 5, despite being smaller. This could be caused by a socket that had a longer solid upper portion than usual. Very little of the actual socket is preserved on Nimrud 264, so what remains is mostly solid metal.

9.7.4. 2-5 – bilobate w/angled shoulders and long socket

Essentially identical to Type 2-2, Type 2-5 differs in that it has distinctly angled shoulders. There are four examples from the sites surveyed, two from Gerar, one from Hasanlu and one from Uruk. The shoulders of Hasanlu 85 are noteworthy in that they do not angle back directly to the socket, but rather angle a second time, allowing the blade to meet the socket at a much shallower angle than in the other examples. The purpose of the angled shoulder was likely decorative, since they have no obvious functional purpose. In any event, their comparative rarity suggests that rounded shoulders were the 'standard' shoulders for Type 2 arrowheads, and angled shoulders constituted a rare variation, though not a regional variation, as they are attested at widely-separated sites.

9.7.5. 2-6 – bilobate w/angled shoulders and hooked socket

Also rare are Type 2-6, which are essentially Type 2-3 hooked bilobates with angled shoulders. Like Type 2-5 above, these must be considered a rare variation, but not a regional variation, since they are attested both in the southern Levant and in Transcaucasia.

9.7.6. 2-7 - bilobate w/concave shoulders and short socket

The single Type 2-7, Ayanis 105, resembles a Type 2-1 with noticeably concave shoulders. However, the right shoulder is markedly more concave than the left, which shows only the barest hints of concavity. The drawing does not make the state of the artifact absolutely clear, but it is very possible that the concavity of the right blade is merely the product of damage or corrosion, and thus, as originally cast, Ayanis 105 may have been a perfectly ordinary Type 2-1 arrowhead (many of which were recovered at Ayanis).

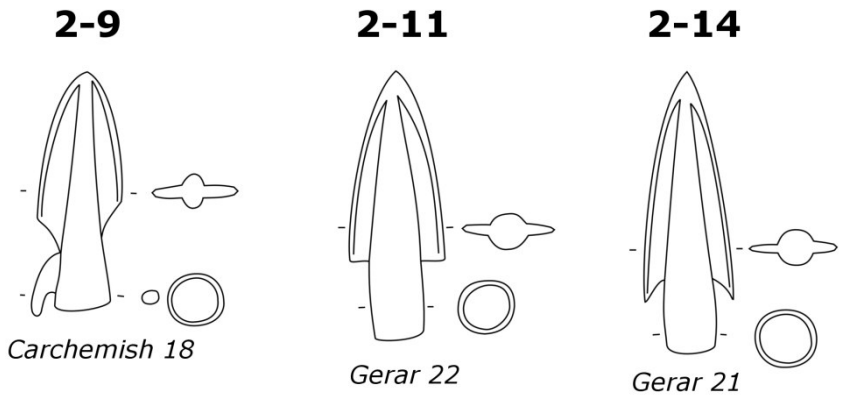

Figure 9.24: Types 2-1 to 2-7.

9.7.7. 2-9 – bilobate w/long socket, concave shoulders and hook

Carchemish 16 is the lone example of Type 2-9, which is essentially a Type 2-3 with concave shoulders. As with angled shoulders, there does not appear to be a practical function for the concavity of the shoulder as opposed to rounded shoulders, so it was most likely an aesthetic choice on the part of the mold maker, unless it was originally a Type 2-3 which had its rounded shoulder filed into concave ones after casting. One reason this may have been done is if one of the blades had been damaged, the archer may have desired to preserve the arrowhead and make it usable again by filing away the damaged area and then filing the other blade down to match so that the arrowhead would still be balanced.

It should also be noted that the upper portion of the socket of Carchemish 16 is rather small in relation to the width of the blades, giving it something of the effect of mimicking a ribbed leaf-shaped arrowhead, much as Carchemish 15 (Type 2-2) and Uruk 17 (Type 2-1).

9.7.8. 2-11 – bilobate w/long socket and squared shoulders

As the sole example of Type 2-11 comes from Gerar, nothing can be said about the date of the artifact, and it may post-date the period covered by this work. The squared shoulders may have had a functional purpose, as opposed to those with angled or concave shoulders. A sharply squared shoulder might have much the same effect as a barb in preventing the arrowhead from being easily withdrawn from a wound.

9.7.9. 2-14 – bilobate w/barbs and long socket

This type of arrowhead is attested at Gerar and Hasanlu. The Gerar example is undated, but those from Hasanlu come from Level III, dating from the 8th to 4th Centuries BC, and therefore may well be of later date than the period covered by this work. Erdmann reports similar arrowheads (her Type

DIIb) dating to the Achaemenid Period from Asia Minor and Egypt, but also an example from the later 8th Century BC from the Artemision on Delos.[70] Type 2-14 bilobates consists of a bilobate arrowhead with a long socket, however the lower part of the blades are cut back and upwards to the socket, forming barbs. The barbs were intended to hook into the flesh of the target and inhibit removal. However, socketed bronze arrowheads nearly always use hooks for this purpose, and the reason why barbs were chosen in this case is unclear.

9.8. Type 3a – TRILOBATES

Trilobate arrowheads are an elaboration of bilobates. Instead of two blades forming a flat plane, three blades are spaced evenly at 120º intervals around the core of the arrowhead. Most trilobates have sockets (which form the core of the arrowhead), and were made of cast bronze. Trilobates with tangs are attested, though they are very rare in the period covered by this work.[71]

The purpose of the additional blade was to cause more bleeding and to create a star-shaped wound that would be more difficult to treat than the linear wound produced by a bilobate arrowhead.[72] Indeed, one must presume that the trilobate form of arrowhead was found to be very effective, as shortly after its introduction in the Near East, sometime in the mid 7th Century BC,[73] it spread throughout the Near East and beyond. Its popularity continued well into the Hellenistic period,[74] being adopted by many peoples, including the Greeks (due to which, trilobates are sometimes referred to as 'Graeco-Scythian' in archaeological literature dealing with the Classical world[75]).

In further evidence of its great popularity, the trilobate form was also adapted to iron despite the considerably greater labor necessary to forge this kind of shape in iron. Unlike a flat leaf-shaped arrowhead, the shape of which may be easily drawn out on a flat anvil, a trilobate would have to be carefully formed over an edge (or a specially-made swage block), and the smith would have to take care not to damage the other blades while working on one of them A certain degree of skill in hammering would have been necessary to work with such precision in such a small area (though some amount of labor was saved by the universal use of tangs with iron trilobates rather than sockets). Clearly, the benefits of a trilobate arrowhead were worth the considerable extra labor involved in their

[70] Erdmann 1973, pp. 49 & 53-54
[71] For more numerous Roman examples from the late 1st Millennium BC to early 1st Millennium AD, see Bishop & Coulson 1993, pp. 55, 79, & 138.
[72] Modern hunting arrows very commonly have three to four blades for precisely the same reason: to cause greater bleeding of the target.
[73] Derın & Muscarella 2001, p. 197
[74] James 1990, p. 83
[75] Sulimirski 1954, p. 295

manufacture. Iron trilobates are rare in the early 1st Millennium BC, but by the early 1st Millennium AD, they had become one of the principle forms of arrowhead employed by the Romans.[76]

Sulimirski speculated that trilobates were developed by combining the characteristics of tanged quadrilobates with those of socketed bilobates,[77] however this is certainly not the case. While it is indeed likely that trilobates were an elaboration of the bilobates, which appeared in the 2nd Millennium BC (see §7.3), quadrilobates are first attested nearly a century after the first attested trilobates (dating to the early 7th Century BC[78]). More significantly, quadrilobates are known from only one site, Carchemish, while trilobates have been found across the Near East. It is far more likely, therefore, that quadrilobates developed from trilobates (see §9.11).

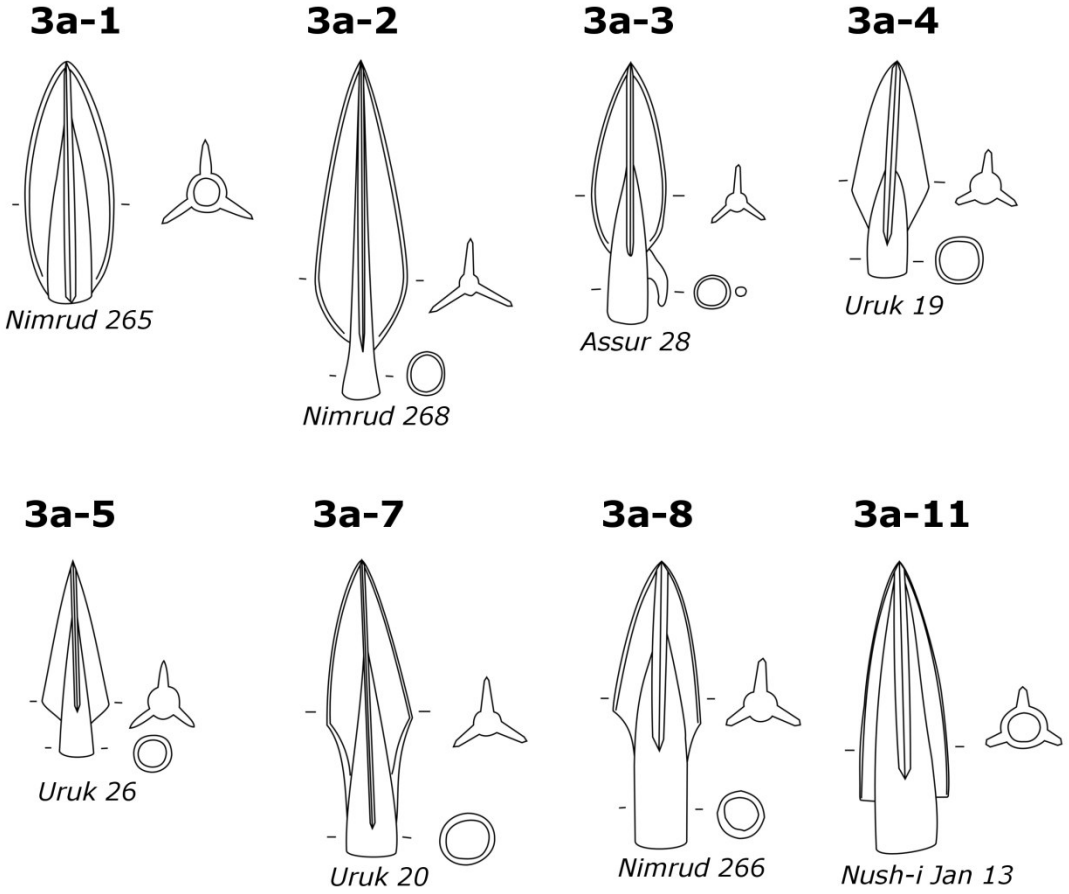

Figure 9.25: Types 3a-1 to 3a-11.

9.8.1. 3a-1 – trilobate w/short socket

Type 3a-1 is a basic trilobate arrowhead. It had 3 blades with rounded shoulders and comes to an acute point. The base of the socket is more or less flush with the bottom of the blades.

[76] James 1990, p. 84
[77] Sulimirski 1954, p. 311
[78] Boehmer 1972, p. 115

Short-socketed trilobates are invariably made of cast bronze. Only seven examples are attested among the surveyed sites, however it appears that the form may have become somewhat more common in later periods.[79] However, since one example was found at Nimrud and can be dated to the late Neo-Assyrian Period with relative confidence, it is apparent that short-socketed trilobates were used contemporaneously with their more common long-socketed siblings by the end of the Neo-Assyrian Period.

The five Type 3a-1 arrowheads from the surveyed sites with intact blades cover a consistent range of blade lengths from 3.0 to 4.2 cm. Because their sockets are encased in the blades, Type 3a-1s appear to be smaller than their long-socketed counterparts, though their weights are actually very comparable. Nimrud 265 weighs 4.5 grams, while a comparable long-socket example from Nimrud (Nimrud 268) weighs only 3.0 grams, and long-socket examples from Carchemish (Carchemish 17-18) weigh between 4.0 to 5.0 grams. Thus Type 3a-1 most likely did not have a functional differentiation from those with long sockets, but rather an aesthetic one.

Among the sites surveyed, Type 3a-1s appear to be concentrated in Northern and Southern Iraq, with a single additional example coming from Gerar (which may date to a later period). Therefore, it is possible that in the period covered by this work, Type 3a-1s were regional arrowheads, used first in Northern and Southern Iraq and only later spread to other areas.

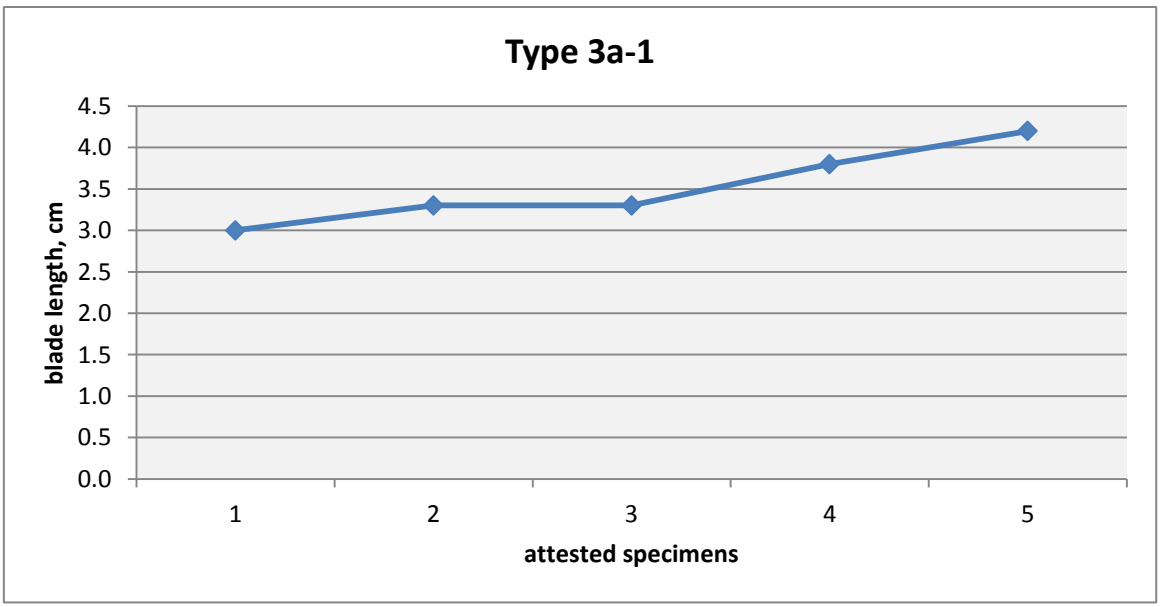

Figure 9.26: Sizes of Type 3a-1 arrowheads.

[79] Short-socketed trilobates appear to be common in the Treasury of Persepolis, for example; see Schmidt, E.F. 1957, p. 97& pl. 76 and it was 'almost universal' at Thermopylae; Snodgrass 1964, p. 153

9.8.2. 3a-2 – trilobate w/long socket

The most common form of trilobate attested at the sites surveyed, Type 3a-2 has a socket which extends significantly below the blades of the arrowhead. The long socket has no obvious functional difference from short sockets, merely increasing the overall length of the arrowhead.

Of the 50 Type 3a-2s, 34 have known blade lengths. They are distributed fairly evenly over a size range from 1.7 to 4.8 cm. With the exception of one undated example from Gerar, all the largest Type 3a-2 arrowheads come from Assur, Nimrud and Uruk, which could represent a regional tendency for larger Type 3a-2s in Northern and Southern Iraq. The profiles of these arrowheads are very similar, which further suggests that they all derive from the same tradition.

Long-socket trilobates are found over a broad range of sites in all the regions covered by this work. Curiously, although Type 2-2 arrowheads are very common at Urartian sites, Type 3a-2s are conspicuously absent save one single example which in such a bad state of preservation that its classification is uncertain (Karchaghbyur 9). The vast majority of Type 3a-2s come from Assur and presumably date to the destruction of the site in 614 BC.

The earliest 3a-2s with precise dates are those which have been associated with destruction levels from the end of the Neo-Assyrian Period, though some of the other examples could conceivably be earlier.

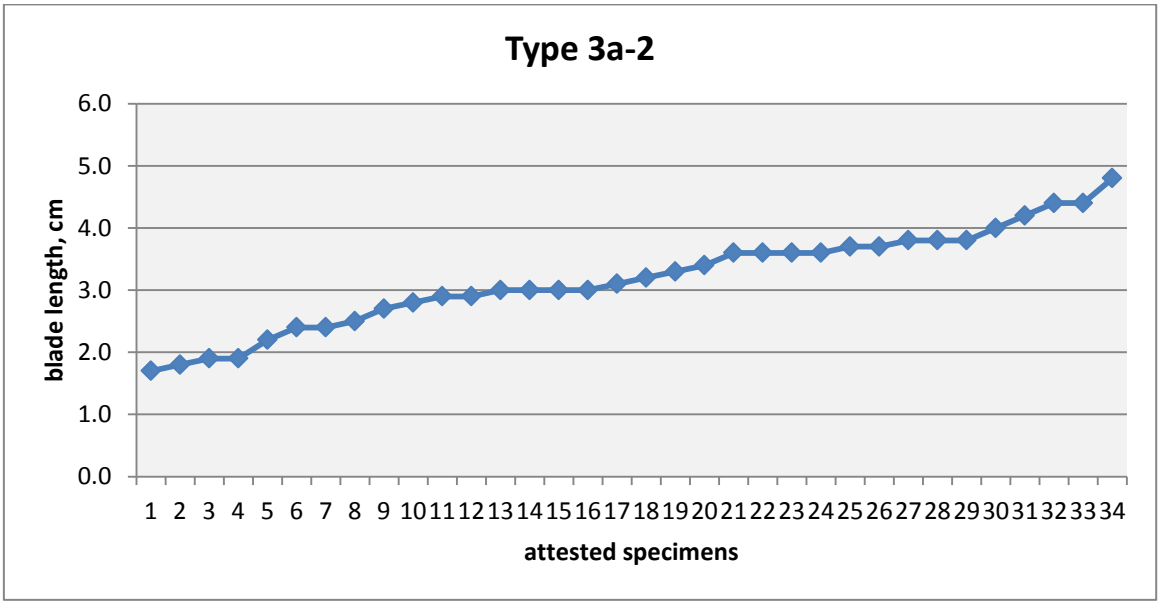

Figure 9.27: Sizes of Type 3a-2 arrowheads.

9.8.3. 3a-3 – trilobate w/long socket and hook

Type 3a-3 is a modified version of Type 3a-2, with a backwards-pointing hook attached to the socket just below one of the blades (which is often slightly shorter than the other blades, to allow more room on the socket for the attachment of the hook). Hooks are never found on short-socket trilobates, as they require some length of socket to be mounted on.

Hooked trilobates were clearly used alongside plain long-socket trilobates as they are often appear mixed together in the same archaeological context (for example, many of both types were found at Assur). As is the case with hooked and unhooked bilobates (see above), there is no indication why both were used at the same time.

Of the 20 Type 3a-3s, 18 have known blade lengths. The majority of these fall into the compact range of 2.0 to 3.3 cm long. Assur 40 is unusually small, at a mere 1.4 cm (the whole arrowhead is only 2.3 cm long). The largest three – Carchemish 1 & 2, and Assur 21 – are significantly longer than the others. This may suggest that Type 3a-3 arrowheads were generally divided into three size groups, presumably based on mass. Unfortunately, the only two arrowheads with a known weight (Carchemish 1 and 2, both 4.5 grams) are both in the larger category, so a comparison of the weights of these with those of the smaller two groups cannot be made. Type 3a-3s are found in all regions covered by this study with the exception of Southern Iraq. The Toprakkale examples could date to as early as ca. 650 BC and the Hasanlu examples could also date to the earlier part of the 8th Century BC, but the earliest accurately dated examples are one from Assur (614 BC) and two from Nineveh (612 BC).

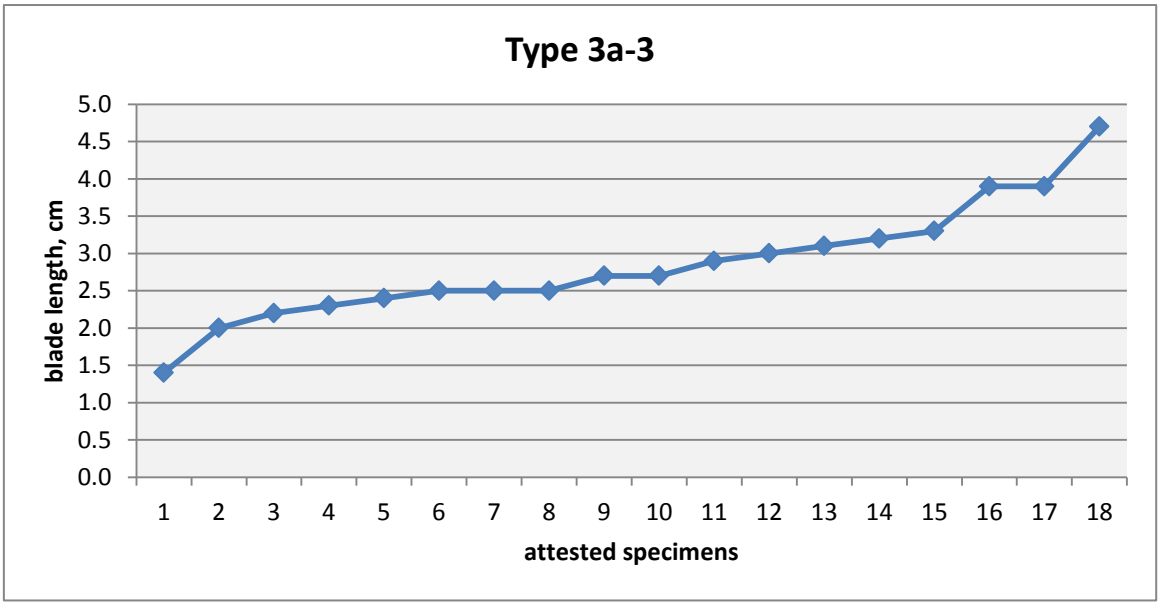

Figure 9.28: Sizes of Type 3a-3 arrowheads.

9.8.4. 3a-4 – trilobate w/short socket and angular shoulders (3b)

Otherwise similar to Type 3a-1, these arrowheads have sharply angled shoulders. There is no apparent functional difference between those with curved and those with angled shoulders, though it should be noted that curved shoulders appear to have been far more common. As they are found both at Gerar and at Uruk, it would appear that, while rare, Type 3a-4 was used over a reasonably widespread area.

9.8.5. 3a-5 – trilobate w/angled shoulders and long socket

Type 3a-5 arrowheads are similar to Type 3a-2, except that the shoulders are angled rather than rounded. Nush-i Jan 14 is heavily corroded, however, so the angled appearance of the shoulders could be a result of damage rather than deliberate design.

The four extant examples come from different regions, Transcaucasia, Iran and Southern Iraq, which, as with Type 3a-4, suggests that while rare, this form was used over a wide area. Furthermore, all four examples have very comparable blade lengths, from 2.0 to 2.4 cm.

9.8.6. 3a-7 – trilobate w/concave shoulders and short socket

Type 3a-7 is similar to Type 3a-1 arrowheads, but instead of rounded shoulders, it has concave shoulders which curve back to the end of the socket (or very close to the end). The concavity of the shoulders does not appear to serve any functional purpose, and is thus most likely an aesthetic feature. The three examples are from three widely-separated sites (Assur, Uruk and Gerar), yet have a very consistent blade length, from 2.8 to 3.4 cm.

9.8.7. 3a-8 – trilobate w/concave shoulders and long socket

Type 3a-8 has concave shoulders and a long socket, and therefore may be considered a variation of type 3a-2. Two examples exist from Assur and Nimrud. With blades of 2.5 and 2.9 cm long, they are on the small size of the size curve for Type 3a-2 arrowheads. Nimrud 266 dates from the end of the Neo-Assyrian Period, though unfortunately no date can be assigned to Assur 41. However, given that both examples were found at sites in Northern Iraq, it does suggest that Type 3a-8 was used in a fairly small region.

9.8.8. 3a-11 - trilobate w/long socket and squared shoulders

Another variant of Type 3a-2 is that with squared shoulders. Three examples are attested among the sites surveyed. The Assur example is 2.9 cm, which is still on the small side for a Type 3a-2, though well within the normal range. Ayanis 107 is only slightly longer at 2.3 cm. The Nush-i Jan example

has a preserved blade length of 2.9 cm as well, however a considerable portion of the tip has broken off, so it was originally somewhat longer. As each of the three extant examples come from different regions (Northern Iraq, Transcaucasia and Iran), this type appears to have been rare but widely spread. As in the case of Type 2-11, the sharply squared shoulders may have functioned rather like barbs, inhibiting the removal of the arrowhead from a wound.

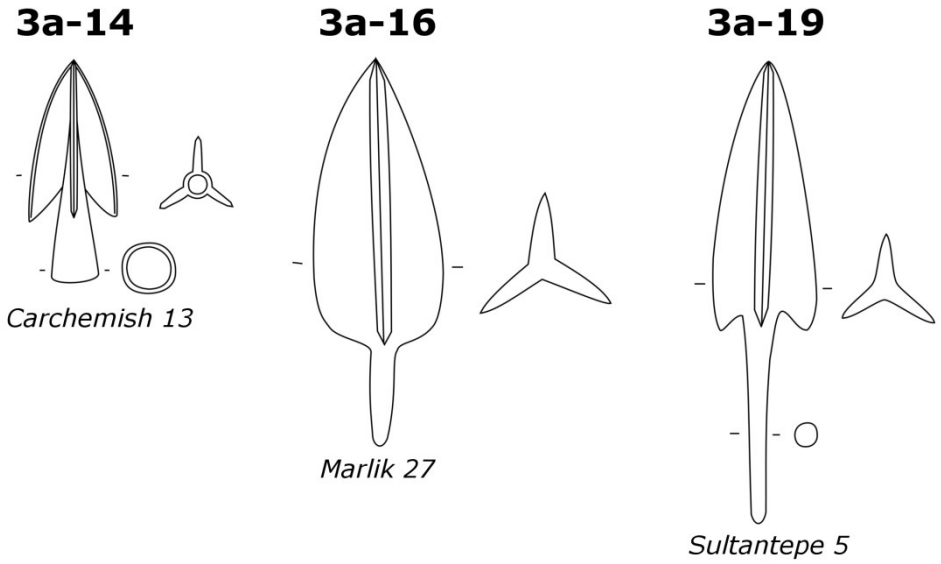

Figure 9.29: Types 3a-14 to 3a-19.

9.8.9. 3a-14 – trilobate w/long socket and barbs

While barbs are not at all uncommon on tanged iron trilobates, they are exceedingly rare on socketed bronze ones. It is not clear why the three (perhaps four) attested examples were given barbs rather than hooks, which are otherwise nearly universal on socketed bronze arrowheads (one other exception is Gerar 21, Type 2-14). One possible explanation is that hooks tend to project back well below the bottom of the socket, requiring the arrow to penetrate deep into the target for the hook to be able to catch. The sharp corners of the barbs on the Type 3a-14s are much closer to the tips of the arrowheads than the ends of hooks would have been, so a Type 3a-14 would not have to penetrate as deeply into the target for the barbs to hook into the flesh. This would seem to be a desirable trait in general, nevertheless, hooks were used far more often than barbs in practice.

Three very similar Type 3a-14 arrowheads came from House D in Carchemish and date to the late 7th Century BC. They have gently curving blades, ending with sharply cut back barbs, which are rather deep due to the relative width of the blades. The socket extends significantly below the end of the blades. All three arrowheads have identical measurements. Indeed, it is possible that Carchemish 12 and 13 come from the same mold, as their proportions seem identical, but Carchemish 14 certainly

came from a different mold, owing to its narrower socket and the fact that it weighs 2.5g compared to the 3.0g of the other two. Therefore, as rare as attested examples of this form of arrowhead are, at least two molds were made to manufacture them.

Snodgrass suggests a Greek origin for this form of arrowhead,[80] and indeed, several other military artifacts of clearly Greek origin were found at Carchemish.[81] However he also notes that similar arrowheads also occur in Scythian contexts in western Europe.[82] As discussed above (see §7), assigning ethnic labels to artifacts is highly problematic, and in the case of Type 3a-14s, the issue is far from straightforward. For example, Snodgrass neglects the possibility that the Carchemish examples, with their distinctive shape, may have been a local invention. After all, Carchemish appears to have been the source of another innovation in arrowhead design, namely the Type 4 quadrilobates. In any event, while speculation about the origin of Type 3a-14s may be futile, the distribution of surviving examples in the Near East shows that they were used in a relatively small area, from Northern Iraq to the northern part of Syria, though of course the small size of the sample makes even this conclusion rather hypothetical.

The only other attested example of a 3a-14 is uncertain. At 5.2 cm, Assur 50 has a much longer blade that the Carchemish examples, and the barbs are merely small nicks compared to the large, well-defined barbs from Carchemish. Indeed, it is questionable whether or not Assur 50 is really a Type 3a-14 at all, as due to the quality of the photograph, the bottom of only one of the 3 blades is clearly visible. The "barb" on this blade could in fact have been produced by a fragment of the bottom of the blade being lost through corrosion. If similar barbs appear on the other 2 blades (which are not visible in the photograph, as one is in shadow and the other edge-on to the camera), then it would confirm it is a Type 3a-14. If they do not, then it is merely a corroded 3a-2.[83] Nevertheless, a very comparable example from Persepolis (see Figure 9.30)[84] which is clearly barbed at least demonstrates that such a blade form with small barbs would not be unprecedented (though the Persepolis example possesses a tang rather than a socket). Because the barbs are so small, it is also possible that the arrowhead was cast as a 3a-2, and an industrious archer or craftsman modified it into a barbed arrowhead by filing notches into the back sides of the blades (though this does not appear to be very likely in the case of the Persepolis example, which has rather more well-defined barbs).

[80] Snodgrass 1964, p. 153
[81] for example, an Archaic Greek greave and shield; see Niemeier 2001, pp. 19-20
[82] Snodgrass 1964, p. 153
[83] It will unfortunately be impossible to resolve this issue, since the artifact can no longer be located, according to a personal communication I had from Dr. Friedhelm Pedde of the Assur Project.
[84] Schmidt, E.F. 1957, pl. 76:15

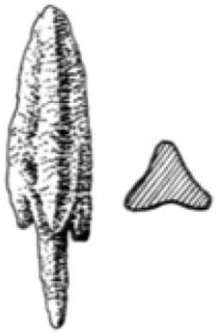

Figure 9.30: trilobate with barbs and a tang, from the Persepolis Treasury; after Schmidt, E.F. 1957, pl. 76, no. 15 (not to scale).

9.9. Types 3a-16 to 3a-20 – TANGED TRILOBATES

Tanged trilobates are among the rarest trilobate arrowheads in the period covered by this work. Stronach suggested that tanged trilobates only became common in northern Mesopotamia only after the mid 2nd Century BC, based on Parthian-era finds from Nineveh.[85] In fact, they appear to be fairly rare in general until the Achaemenid Period at least. Nevertheless, the earliest securely dated example, it must be observed, dates to the late 7th to early 6th Centuries BC (Toprakkale 22), and Cleauziou reported them in Kazakhstan in the 9th Century BC, and speculated that they may have been the first trilobate arrowheads, the socketed trilobates being developed from them.[86]

Some tanged trilobates are made of iron, presumably because if one wished to cast a trilobate arrowhead, one may as well cast a socketed one. Since small sockets were difficult to forge, if one desired to forge a trilobate arrowhead, then one would naturally equip it with an easily-forged tang rather than a socket. It is possible, therefore, that these tanged iron trilobates were the form resorted to when socketed bronze trilobates were not available. Nevertheless, a number of examples of tanged trilobates are made of bronze. If they were forged of bronze, the same considerations for forging iron apply. If they were cast, the most likely reason that the socket was replaced by a tang was to simplify the mold necessary to produce it. It would still require three pieces, one to form each face of the blades, but the bottom piece with the cone that would prevent the socket from becoming solid bronze could be dispensed with. This does not appear to have been a common solution, however, as tanged bronze trilobates are comparatively rare.

9.9.1. 3a-16 – trilobate w/ unstopped tang

Of Type 3a-16, there are only 4 exampled attested for the period covered by this work. Three, all of bronze, come from Tomb 7 in Marlik, and one iron example is from Toprakkale. The Marlik

[85] Stronach 1958, p. 172
[86] Cleauziou 1977, p. 189

examples are of particular interest, since the site was abandoned ca. 750 BC, which is very early for trilobate arrowheads of any kind. Unfortunately, the published photographs of the Marlik examples do not allow much in the way of detail to be made out. A better-illustrated example comes from Boğazköy.[87] As it is associated with Büyükkale I, the late Phyrgian period,[88] it likely dates to the end of the period covered by this work.

Negahban postulated that the Marlik tanged trilobates were the first form of trilobates, and socketed versions later developed from them, and also implied that the nomadic groups associated with trilobates borrowed the basic form from the Marlik culture.[89] Assuming that the dating of these arrowheads is indeed correct and they are not later intrusions, they are indeed the earliest attested trilobates in the Near East. While Ghirshman speculated that socketed trilobates must have appeared around 750 BC,[90] possibly contemporary with the Marlik trilobates, both Boehmer and Stronach observed that the earliest accurately dateable socketed trilobates in the Near East date to the 7th Century BC and are spread over much of the Near East (Iran, Northern Iraq, Transcaucasia, Syria, Anatolia and the Levant).[91]

Socketed bronze trilobates clearly do not pre-date the Marlik tanged trilobates. However, a tanged trilobate dating to the 9th Century BC was found in Kazakhstan,[92] which may predate the tanged trilobates from Marlik (which are very roughly dated to 1250-750 BC). Tanged trilobates may, therefore, have developed in Central Asia (closer to the homeland of the socketed bronze arrowhead), yet if the Marlik examples are older, then they may have indeed been developed by the Marlik culture. While it is hardly conclusive, the considerable experimentation with arrowhead form that finds from Marlik exhibit lends some weight to this hypothesis. Socketed trilobated may have indeed developed from tanged trilobates during or shortly before the 7th Century BC, combining the most advantageous features of socketed bilobates (the socket) and tanged trilobates (the extra blade), however where this development occurred is unclear due to the wide spread of socketed trilobates when they do appear.

The dating of the Marlik finds presents another quandary. Tanged trilobates appear to become much more common shortly after the period covered by this work. Besides the Marlik finds, the earliest comparable examples are of tanged trilobates with barbs (Type 3a-19, see below) from Sultantepe, dating most likely to the end of the 7th Century, which leaves a gap of over a century with no attested tanged trilobates. Therefore, it appears that tanged trilobates may represent the first stage of

[87] Boğazköy 1550; see Boehmer 1972 p. 152 & pl. 51
[88] Genz 2004, p. 9
[89] Negahban 1996, p. 280; Cleauziou 1977, p. 189 put the earliest tanged trilobates in Kazakhstan in the 9th Century, thus the Marlik tanged trilobates may themselves been borrowed from an earlier source.
[90] Stronach 1978, p. 180
[91] Boehmer 1972, pp. 114-115; Stronach 1978, pp. 180-181
[92] Cleauziou 1977, p. 189

development of the trilobate arrowhead, but then were abandoned in favor of the more effective socketed variety. Then, as a result of the success of socketed trilobates, trilobates were again adapted to tangs. The later tanged trilobates are iron, so the return to tangs was doubtless due to the material chosen (since sockets are far more difficult to make in iron than tangs). Such tanged trilobates from the Achaemenid Period were found at the Persepolis[93] and were later commonly used by Roman archers.[94]

The fourth Type 3a-16 is the tiny Toprakkale 22, with an iron blade of only 1.4 cm. With its tiny blade surmounting a very long and surprisingly thick tang, it clearly has different proportions than the Marlik examples. The blades scarcely project further out than the tang. Indeed, it would seem likely that when the tang was inserted into a reed shaft, the edges of the blades would have been flush with the outer surface of the shaft.

It is conceivable that the curious dimensions of this arrowhead are the result of the method of its manufacture. The thickness of the tang and narrowness of the head suggest that the smith began with a metal rod the thickness of the tang. He then created three depressions using a chisel-shaped implement near the end of the rod which became the cavities between the blades, and the modest amount of metal displaced in this process was forced out to become the blades. Though the head is very small, the long, thick tang would have given this arrowhead a reasonable amount of weight relative to its size, and combined with the small proportions of the head, it could have been intended to function rather like a bodkin – to concentrate impact energy in order to maximize penetration, though consequently making a fairly small wound.

9.9.2. 3a-19 – trilobate w/ unstopped tang and barbs

Type 3a-19 are modifications of type 3a-16, in which the bottoms of the curving blades are cut back to form barbs. From all the sites surveyed, there are only two examples from Sultantepe and one from Hasanlu. Sultantepe 5, comes from the destruction of that city around the end of the Neo-Assyrian Period and thus is the earliest attested Type 3a-19. The second example, Sultantepe 3, was found in a grave "immediately post-dating" the destruction of the site,[95] yet there is no indication precisely how long afterwards it was made, and it could date to well into the Achaemenid Period. While Hasanlu 91 may date as early as the early 8th Century BC, it may also be Achaemenid in date. In any event, this form of arrowhead appears to be significantly more common in later periods.[96] The Sultantepe

[93] Schmidt, E.F. 1957, pl. 76:15-16
[94] Bishop & Coulson 1993, pp. 55, 79, & 138
[95] Lloyd 1954, p. 107
[96] for examples from the Persepolis Treasury, see Schmidt, E.F. 1957, pl. 76:15-16

examples are iron, however Hasanlu 91 is bronze, an unusual metal for tanged trilobates, but paralleled by several earlier examples of Type 3a-16s from Marlik.

9.10. Type 3b & 3c – TRIANGULAR TRILOBATE

Types 3b and 3c are 'solid' trilobates, meaning that instead of thin blades projecting from the socket, the arrowhead has a more or less triangular section. They are often referred to in the literature as "pyramidal" due to the fact that they are essentially triangular bodkins.[97] However, these have sockets rather than the tangs typical of bodkins. Because they are cast bronze, they can easily be made with three faces, while it is far easier to forge a 4-sided or round bodkin.

Solid Type 3b and 3c trilobates are clearly related to Type 3a trilobates, both being three-sided, cast bronze, and possessing sockets. The solid trilobate could represent an attempt to make a trilobate more in the form of a bodkin in order to improve its ability to penetrate armor. The three blades of a trilobate would likely have caused some amount of friction on penetration, and so replacing them with flat faces and concentrating the weight in a smaller cross-section would have aided in that purpose, though at the cost of creating a smaller wound.

Triangular trilobates are uncommon in the period covered by this work, however they appear to have become more common subsequently since examples have been found in the Persepolis Treasury,[98] and they also appear to have been used extensively by the Greeks around the time of the Persian Wars.[99]

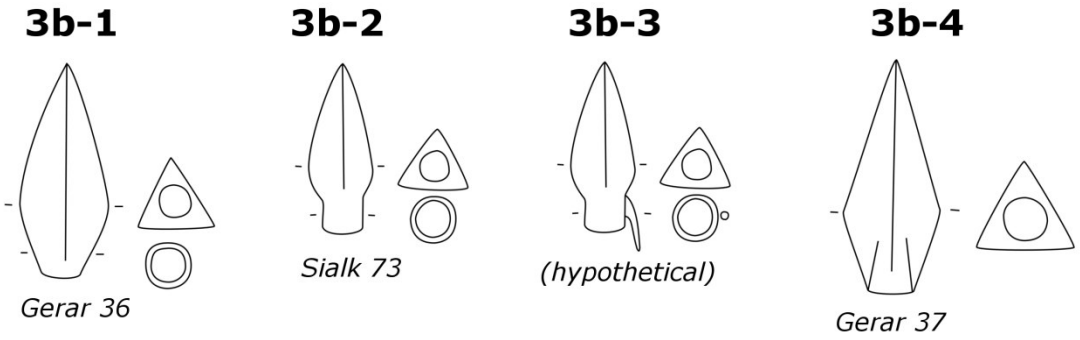

Figure 9.31: Types 3b-1 to 3b-4.

[97] e.g., Yamauchi 1983, p. 94 and Sulimirski 1954, p. 295
[98] Schmidt, E.F. 1957, pl. 76:14
[99] Snodgrass 1954, pp. 153-154

9.10.1. 3b-1 – triangular trilobate w/short socket

The single Type 3b-1 from the sites surveyed is Gerar 36. As it comes from Gerar, its date is not known, and thus it may be later than the period covered by this work. At 2.8 cm long, it is on the small side compared to the Type 3a-1 trilobates with short sockets (3.0 to 4.2 cm), but otherwise is remarkable only for its rarity. It closely resembles Gerar 37 (Type 3b-4) both in size and shape, save for having rounded shoulders rather than angled ones.

9.10.2. 3b-2 – triangular trilobate w/long socket

The sites surveyed have yielded four Type 3b-2s, the largest number of any of the Type 3b sub-categories. Unfortunately, two of them are from Nineveh and thus do not have images for closer comparison. Sialk 73 and Hasanlu 89, however, provide an example of what the type looks like. Unsurprisngly, they resemble Type 3a-2s, except that their sections show a triangular section rather than the thin, projecting blades of a Type 3a. They are both quite small, with 1.7 cm blades. Thus, though it may have been intended to penetrate armor, it clearly was intended to do so by means of its small cross section rather than weight. Sialk 73 comes from a burial at Sialk, so it dates no later than the 7th Century BC. Those from Nineveh date to 612 BC, so unless the burial at Sialk was from the very end of the 7th Century BC, it is likely earlier than the Nineveh examples. The wide date range of Hasanlu 89, from the 8th to 4th Century BC, means it could either be the oldest or youngest of the attested examples.

9.10.3. 3b-3 – triangular trilobate w/hooked socket

The only Type 3b-3 is from Nineveh, so there is no image available to compare to others (and the depiction in Figure 9.31 is based on Sialk 73). Barbed triangular trilobates are fairly common in the later 1st Millennium BC,[100] however hooked triangular trilobates are exceedingly rare amongst the sites surveyed. Cleuziou lists one example (his Type F12), which has a solid tip with triangular section, but which then extends into three vestigial blades on the lower section of the arrowhead, reporting that this form, dating to the 7th-6th Centuries BC, was found throughout Russia and the Ukraine in the "old Scythian" period.[101] Nevertheless, they appear to have been rare in the Near East up until the end of the Neo-Assyrian Period.

[100] e.g. Brentjes 1995-1996, pp. 202-203, figs. 33-35 and Erdmann 1973, p. 35, fig. 1 (CII)
[101] Cleuziou 1977, p. 191; also note that this type is mis-labeled on as "E12" on his chart on p. 189 (it appears between E17 and F13).

9.10.4. 3b-4 – triangular trilobate w/angled shoulders and short socket

A single undatable Type 3b-4 comes from Gerar. Very similar to Gerar 36 (Type 3b-1) in size and shape, Gerar 37 has distinctly angled shoulders. Since the shoulders of Gerar 36 are fairly close to being angular as well, both of these arrowheads are most likely natural variation on a single theme.

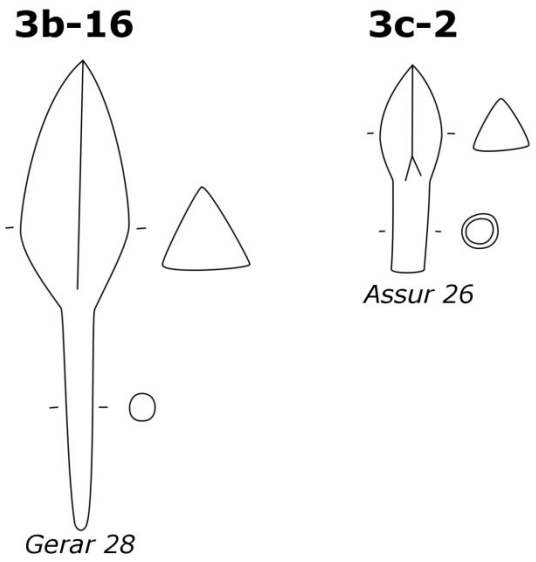

Figure 9.32: Types 3b-16 to 3c-2.

9.10.5. 3b-16 – triangular trilobate w/ unstopped tang

The sole example of a Type 3b-16 comes from Gerar, and therefore is of unknown date. It is made of iron, like most examples of trilobate-type arrowheads with tangs. It would have been easier for the smith to make a Type 1c-2 bodkin with a square section had a bodkin style arrowhead been desired. The fact that the smith nevertheless went to the trouble of forging this 3-sided arrowhead (which probably required some kind of swage block, so the opposite edge would not be flattened when hammering on the opposite flat face) indicates that it was a deliberate attempt to mimic the appearance of a triangular trilobate arrowhead. Thus, this arrowhead most likely dates from around the end of the Neo-Assyrian Period or later, when tanged iron trilobates became more popular.

9.10.6. 3c-2 – triangular quarrel w/socket

Type 3c-2 differs from the triangular trilobates in that the faces of its blade are markedly curved, bringing the quarrels of Medieval European crossbows to mind. The sole example from the sites surveyed is Assur 26, which is of uncertain date (though an additional Urartian example is known

from Çavuştepe,[102] and another more distant example from Smolenice dates to the Halstatt Period[103]). It is very small, almost more akin to the simple conical tips used for modern target practice than to ancient combat arrowheads. This light weight would have allowed for maximum range, and thus it may have served as a form of long-range bodkin. However the reason for the curved faces is not apparent. Flat faces would have been easier to carve into the mold. It was perhaps intended to be reminiscent of the curving edges of the blades of Type 3a trilobates. The edges formed where the faces meet could have been somewhat sharp, and would have followed more or less the profile of Type 3a examples.

9.11. Type 4 – QUADRILOBATE

Quadrilobate arrowheads, with four blades projecting from a central shaft spaced at 90° intervals, are attested only at Carchemish, which produced five examples, all from House D, which appears to have been destroyed in the late 7th Century BC.[104]

Given that tanged quadrilobates are not attested elsewhere, it is likely that they were a local development, perhaps native to Carchemish itself, merging the advantages of conventional tanged Near Eastern arroheads and with those of the recently-introduced socketed bronze arrowheads. Tangs on arrowheads had a long history in the Near East, and they were well suited to reed shafts since the reeds had a natural cavity suitable for accepting a tang (assuming a foreshaft is not used). Yet trilobate arrowheads had the advantage of an extra cutting blade, causing greater bleeding of the target. Quadrilobates upped the ante, adding yet another blade, presumably to cause even greater wounds. It is possible that the second pair of blades developed from a midrib, common in earlier forms of arrowheads, raising the rib until it formed another set of cutting surfaces. Yet it seems more likely that quadrilobates took socketed bronze arrowheads as their model. The backward-curving hooks that three of them possess are essentially identical to those on socketed bronze arrowheads, and three examples (Carchemish 11, 6 and 7) have particularly wide stops which taper towards the tip, distinctly mimicking the shape of a socket.[105]

Perhaps the primary motive behind the development of the quadrilobate was to create an arrowhead that would have the added cutting power of a socketed trilobate, but not requiring so complex a mold. A socketed trilobate needs a mold with a minimum of 4 parts – three segments to form the body of the

[102] Erzen 1978, p. 53, fig. 38:6
[103] Stegmann-Rajtár 2005, p. 151, no. 15
[104] There are 2 arrowheads from Boğazköy that superficially resemble quadrilobates, numbers 880 & 881, however they are clearly unrelated, and their curious appearance is only due to the fact that they have unusually narrow blades, making their ribs stand out more in contrast. See Boehmer 1972, p. 109 & pl. 30.
[105] A similar example of a wide stop mimicking a socket can be seen in a single tanged bilobate arrowhead (Type 5q-2) from Ur, dated to the Neo-Babylonian Period; Woolley 1962, pl. 33 (U.675).

arrowhead, and one plug for the socket. A multi-part mold of this sort would require considerable technical skill to make, as well as a significant amount of time and labor. Theoretically, a quadrilobate could be said to require an equally complex mold with 4 parts (forming the faces of each pair of blades, see Figure 9.33 for a hypothetical reconstruction). However, tanged quadrilobates could most likely be made in simple two-piece molds. By eliminating the socket, no plug would be needed to keep that space free of metal (it would also lose the advantages of a socket for joining the arrowhead to the shaft, but tanged iron arrowheads were still very common at this time). Furthermore, changing the three blades 120º from each other to four blades at 90º also helped to simplify the mold, since it reduce the planes on which the blades lay from 3 to 2. Furthermore, since the blades were fairly small, one pair (along with the hook, if present) could lie along the plane where the molds joined, and the others would be formed by cavities chiseled out of the mold halves, like extended ribs (see Figure 9.34 for a hypothetical reconstruction). This is supported by the fact that on the largest example, Carchemish 7, the blades perpendicular to the plane with the hook are significantly smaller than those in line with the hook. Had the blades been larger, they would likely have been too difficult to remove from a 2-part mold.

A four-piece mold would have eliminated any possible complications in de-molding newly cast arrowheads, however it would demand a significantly more complicated mold, and likely would have nullified what probably was the primary reason for making quadrilobates in the first place. It should also be noted that none of the five quadrilobates from Carchemish were identical, suggesting at least five different molds for such arrowheads.

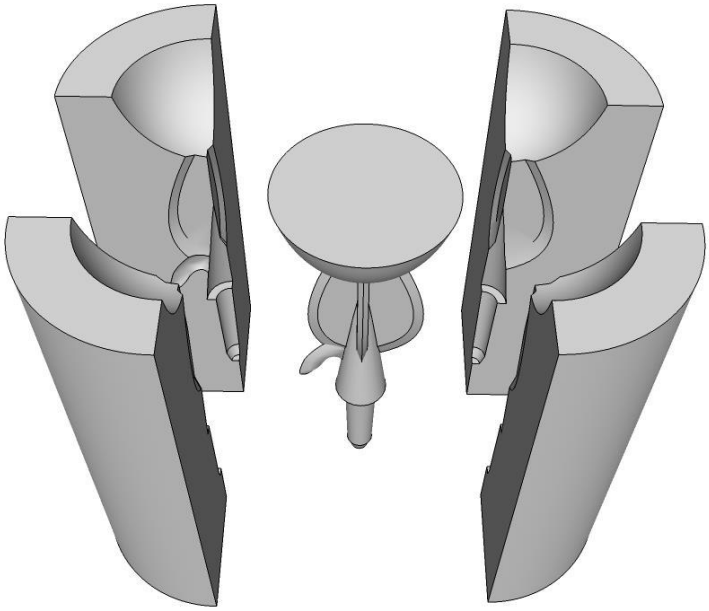

Figure 9.33: A hypothetical four-part quadrilobate mold, with casting.

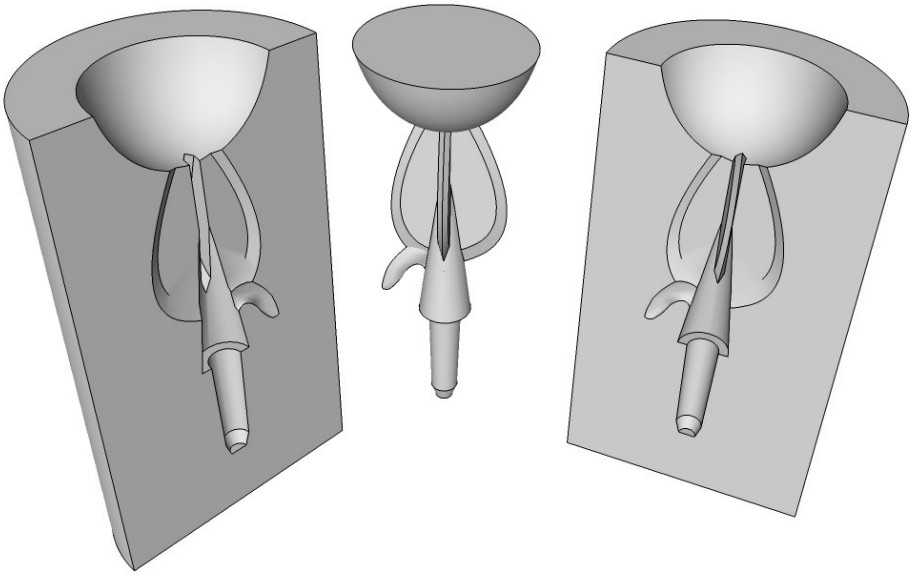

Figure 9.34: A hypothetical two-part quadrilobate mold, with casting.

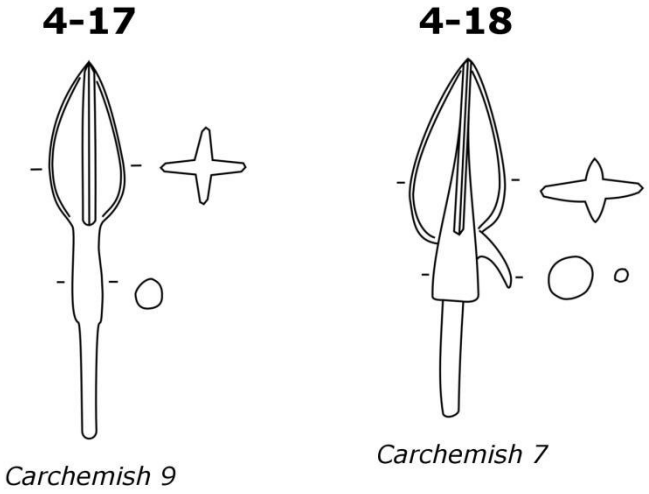

Figure 9.35: Types 4-17 and 4-18.

9.11.1. 4-17 – quadrilobate w/stopped tang

The basic quadrilobate consists of 4 small, leaf-shaped blades mounted on a central shaft with a stop on the bottom. The two examples, Carchemish 10 and 9, are quite similar in size, with blades of 2.2 and 2.4 cm and overall lengths of 5.1 and 4.3 cm, respectively.

9.11.2. 4-18 – quadrilobate w/stopped tang and hook

Essentially identical to Type 4-17, Type 4-18 adds a hook behind one of the blades on the stem of the arrowhead. These stems are wider than on Type 4-17, which makes them more closely resemble

sockets. They are all very similar in size, with blades from 2.1 to 2.5 cm and overall lengths from 4.7 to 5.0 cm. However, Carchemish 11 is considerably narrower and more closely resembles the Type 4-17s, while Carchemish 6 and 7 are noticeably wider and heavier.

9.12. Type 5 – LEAF-SHAPED TANGED ARROWHEADS

Leaf-shaped arrowheads with tangs were arguably the standard form of arrowhead from the Bronze Age until the 1st Millennium BC. They are very simple to manufacture, which no doubt was a prime reason for their near universality until the introduction of socketed arrowheads.

Since leaf-shaped tanged arrowheads were so widely used for so long, it is hardly surprising that they exhibit a great deal of variation, resulting in many more possible combinations of features than is found with other types of arrowheads. There are five different kinds of stops, six different sections, nine kinds of shoulder and eleven overall blade shapes (though only a fraction of the combinations are attested, and some are not even physically possible).

9.12.1. 5 (fragmentary pieces)

Six arrowheads for the sites surveyed were too badly damaged to assign to any specific type, although their general shape was clearly Type 5.

9.12.2. 5a through 5e – LENTICULAR ARROWHEADS

The lenticular section allows the arrowhead to have sharp edges while at the same time being fairly thick at the center of the blade, providing essential longitudinal strength in much the same way as a midrib. When forging a lenticular arrowhead, the smith would simply roll the arrowhead on the anvil slightly as he hammered out the shape of the blade. Since successive blows would strike the metal at slightly different angles, this would produce a curved surface.

With 861 examples, lenticular arrowheads make up the bulk of the arrowheads covered by this study. The vast majority (93.5%) of these are iron – 805 examples, as opposed to a mere 47 made of bronze or copper (nine are of unknown material). This disparity is doubtless caused by the nature of their manufacture. Lenticular arrowheads are comparatively easy to forge in iron, not requiring the precision demanded by rhomboid arrowheads (which need to have their medial ridges correctly centered and straight on both faces). Bronze is more suitable for casting than for forging, and carving the curved surfaces necessary for a lenticular arrowhead mold would have required considerable time-consuming filing and polishing compared to the relatively flat faces commonly found in rhomboid and ribbed arrowheads. Therefore, lenticular sections were normally chosen for iron arrowheads in order to facilitate their manufacture and were not usual for cast bronze arrowheads.

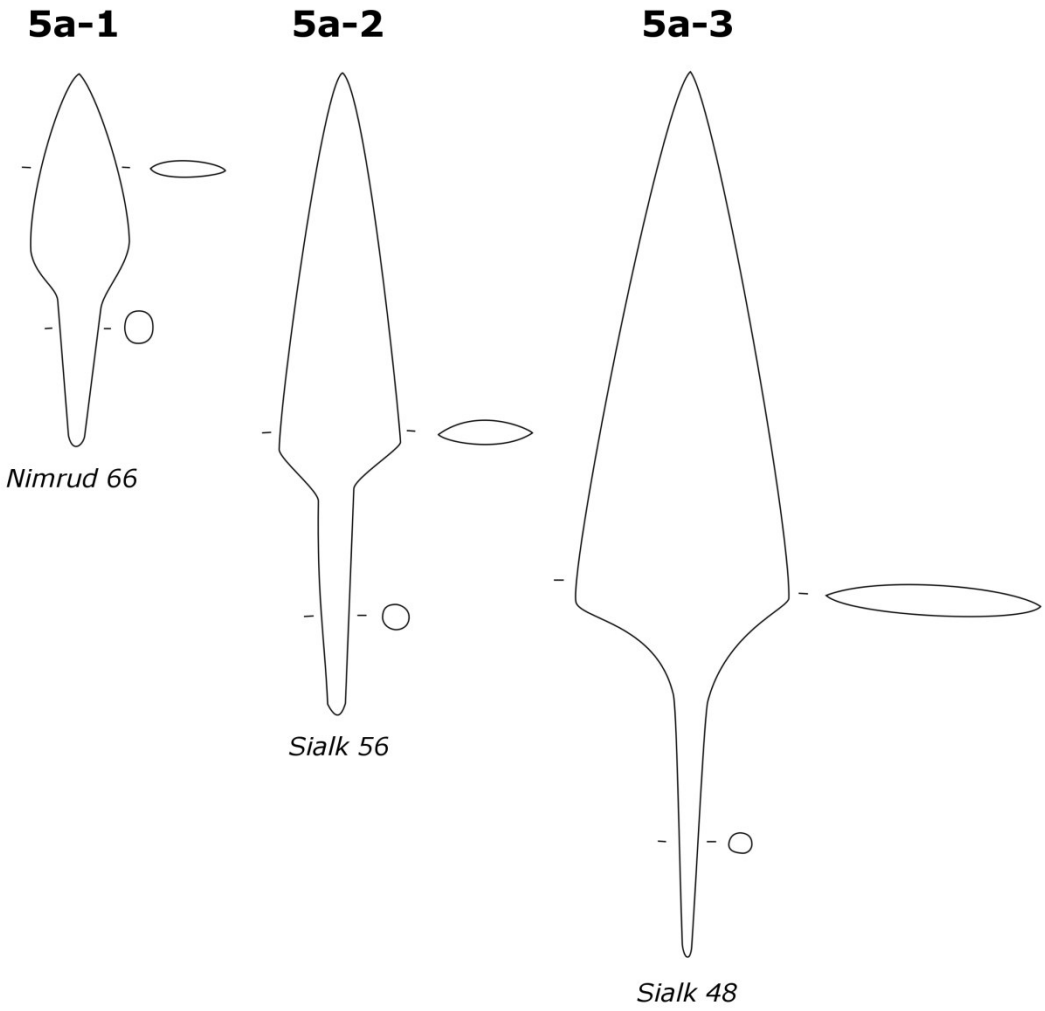

Figure 9.36: Types 5a-1 to 5a-3.

9.12.2.1. 5a-1 – lenticular leaf-shaped w/unstopped tang

Type 5a-1 are the most basic form of leaf-shaped arrowhead, with a simple lenticular section and unstopped tang. They come in wide range of sizes, from large well-made examples to small crudely-made ones. With 434 examples, Type 5a-1s are the most common type of Neo-Assyrian arrowhead. A full 206 of them come from Nimrud, comprising roughly 75% of the arrowheads found there.

Type 5a-1 blades are attested in all sizes from 2.2 to 8.5 cm. The Type 5a-1 arrowheads from Nimrud tend to be small, mostly falling into the compact range of 2.4 to 3.5 cm. These weigh between 1.5 to 4.5 grams (with one exceptionally heavy example at 5.5 grams), and an average weight of 2.8 grams.

The vast majority of the Nimrud finds are associated with its final destruction at the end of the Neo-Assyrian Period. Indeed, the prevalence of Nimrud arrowheads has a major impact on the data (see Figure 9.37 and Figure 9.38). Of the 113 intact examples from Nimrud, 99 have blades of 3.5 cm or

smaller, and the remaining few are all under 4.3 cm. In all the remaining sites, there are 189 intact arrowheads, of which only 21 have blades of 3.5 cm or shorter. When Nimrud is included, the majority of Type 5a-1 arrowheads have blades that are 3.0 to 3.5 cm long, far smaller than the average Type 5b-1 (5.0 to 5.5 cm). However, when Nimrud is removed from the sample, the majority of Type 5a-1s have blades 4.5 to 5.0 cm long, and exhibit a bell curve distribution very similar to that of Type 5b-1 arrowheads (see Figure 9.47), though some 0.5 cm shorter on average. Clearly, there is a massive prevalence of the shorter Type 5a-1s at Nimrud, and a relative lack elsewhere, which goes to show how the idiosyncrasies of a single site can influence the data.

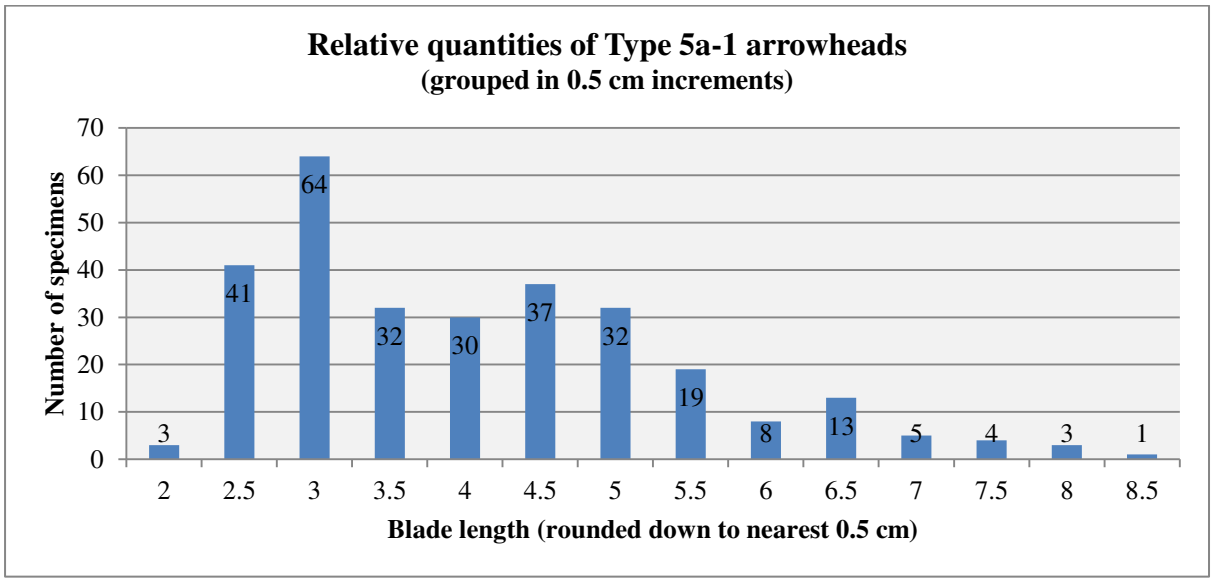

Figure 9.37: Relative quantities of Type 5a-1 arrowheads from all sites (lengths rounded down to nearest 0.5 cm).

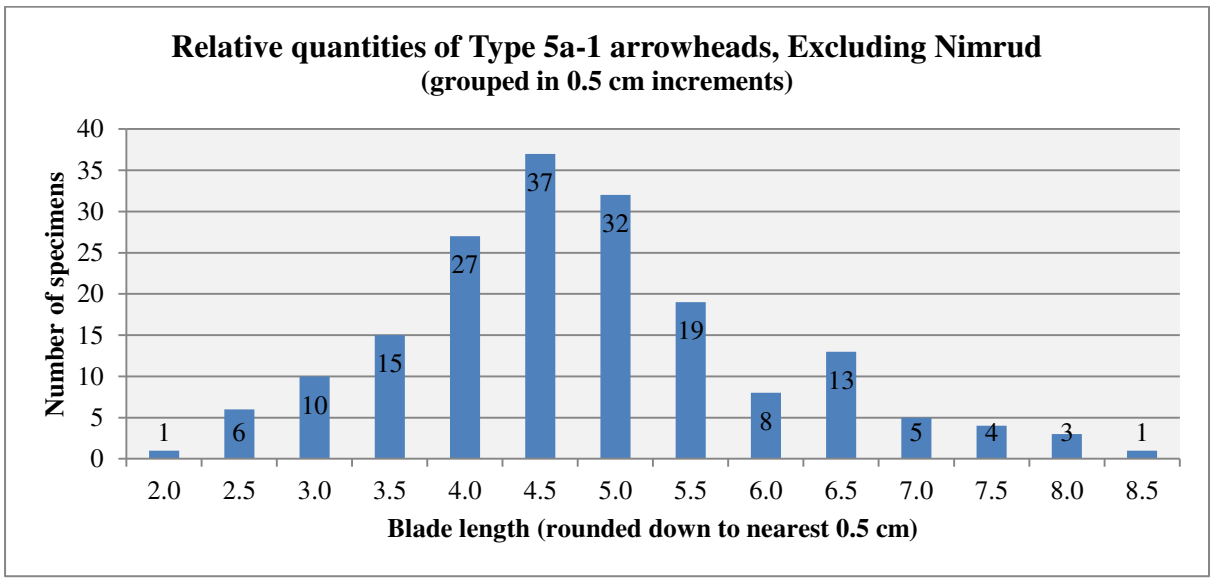

Figure 9.38: Relative quantities of Type 5a-1 arrowheads from all sites except Nimrud (lengths rounded down to nearest 0.5 cm).

The Nimrud arrowheads come, presumably, from the fall of the city at the end of the Neo-Assyrian Period, and this may offer an explanation for their prevalence. The small examples from Nimrud are often very crudely made, with uneven, asymmetrical blades. Their sections, while lenticular in principle, are often only roughly so. Combined with their small size (which would require a smaller amount of metal), this suggests that the Nimrud Type 5a-1 arrowheads were a locally-manufactured response to the pressures leading up to the fall of the city, when doubtless vast amounts of ammunition were needed for the archers, thus a simple form which could be rapidly manufactured was chosen. Their small size may have been due to a desire for arrows capable of long-range firing (though at the cost of having less impact energy), though it may have also conceivably been a response to a possible shortage of iron for ammunition. Nevertheless, other Assyrian cities found themselves in similar desperate situations at the end of the Neo-Assyrian Period, and yet we do not find the same enormous quantities of small Type 5a-1s at those sites, so this would appear to have been a response to a situation particular to Nimrud.

The relatively uniform tangs of the Type 5a-1s from Nimrud merge into the lower part of the blade, which suggests that their manufacture was accomplished as follows: the smith would draw the iron ingot (or whatever other source of iron was being used) into a long rod with the a diameter equal to that desired for the tangs. One end of the rod was heated, flattened out into a blade, and then cut off of the rod, leaving sufficient length of the rod attached to serve as a tang. This method also has the added benefit that, except for the last several arrowheads, the rod would be sufficiently long that its far end would stay cool, allowing the smith to simply grasp it in one hand while he hammered, eliminating the need to use tongs.

Given that the Nimrud Type 5a-1 arrowheads are very light and clearly rapidly made, their primary purpose was likely for long-range massed archery. As the archers engaged in this did not aim at specific targets, but instead saturated an area with a continuous barrage, massed archery was very costly in terms of arrows expended. Thus it is no surprise that Type 5a-1 arrowheads were clearly designed with rapid and inexpensive production in mind. The elimination of features such as stops or barbs reduced the amount of labor the smith needed to put into each item, though consequently making the arrowhead somewhat less effective. Their small size allowed a great number of them to be made for a minimal expenditure of iron.

The condition of the Type 5a-1 arrowheads found at Nimrud also supports the notion that their primary function was for massed archery rather than careful and deliberate aiming. There were a total of 199 found, and nearly half (90) have broken tips, indicating that they struck something hard, such as a wall. It is worth nothing that of the 35 Type 5b-1 arrowheads found at Nimrud, only 7 had broken tips. The higher-quality and heavier Type 5b-1 arrowheads would have been intended for

closer ranges, enabling the archery to take more careful aim, resulting in fewer broken points. Even the larger Type 5a-1 arrowheads from Lachish fared better, with only 12 out of 124 having broken tips. This suggests that weight, rather than form, was the most important criteria in how an arrowhead was employed.

Larger Type 5a-1 arrowheads cover the entire range of sizes from 3.6 to 8.5 cm. They are often noticeably more carefully made than the hasty examples from Nimrud, but the basic logic behind their design remains the same: the elimination of all superfluous features in order to make a simple arrowhead suitable for rapid production. The largest collection of larger Type 5a-1s comes from Lachish, with 123 examples. These are mostly between 4.0 to 6.0 cm long and their weight is correspondingly greater than those from Nimrud, from 3.0 to 17.5 grams (though concentrated between 3.0 to 10.0 grams).

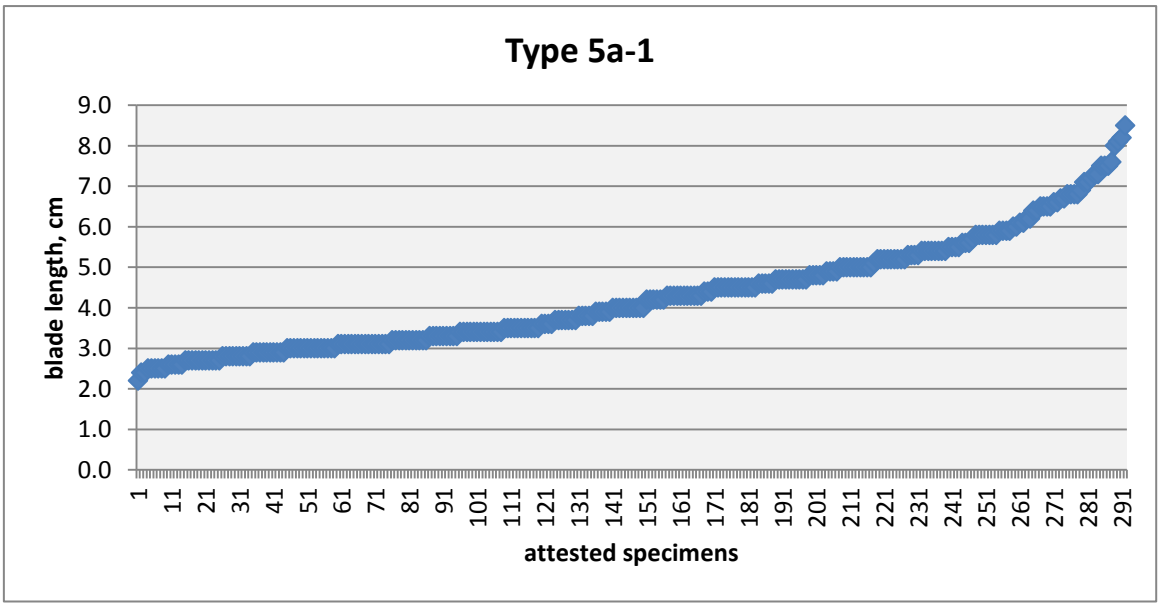

Figure 9.39: Sizes of Type 5a-1 arrowheads.

Type 5a-1s are found in quantity in all regions covered by this work. They appear to have been used throughout the early 1st Milennium BC. The majority of finds are attested at the end of the Assyrian Empire, but some examples from Lachish date from the 9th to the 7th Centuries BC.

The vast majority of Type 5a-1s were made of iron, which is to be expected, since it is a shape that would be comparatively easy to forge. There are, nevertheless, 17 examples of bronze or copper. They do not, as a group, exhibit any significant difference from the iron examples. Indeed, bronze Type 5a-1 arrowheads seem to have been reasonably common in the 2nd Millennium BC.[106] While

[106] e.g. Cross & Milik 1956, p. 17 ; their Type I is essentially identical to Type 5a-1 here

these continued to be made in the early 1st Millennium BC, it is clear that they were nearly entirely superseded by iron examples of the same form.

Type 5a-1 arrowheads were produced through the entire period covered by this work. Indeed, they represent the continuation of a much earlier form of arrowhead into the Iron Age.[107] It should hardly be surprising, however, that this form of arrowhead had such longevity. As it represents the most basic, minimal arrowhead, it would have naturally been used whenever ease of manufacture was a significant issue.

9.12.2.2. 5a-2 – lenticular leaf w/angled shoulders and unstopped tang

A minor variant of Type 5a-1, Type 5a-2 has sharply angled shoulders instead of the more common rounded shoulders. Type 5a-2 is primarily attested in Iran, at Hassnlu, Sialk and Nush-i Jan, but two examples also come from Gerar and one from Lachish.

Type 5a-2 covers a considerable range of blade lengths, from 4.0 to 8.2 cm. The majority of Type 5a-2s come from the Hasanlu IVB destruction level, dating to the 8th Century BC. All are iron and most share a similar profile, with a long blade with gently curving edges, and short, abrupt angled shoulders. Hasanlu 10, however, is an exception to this, possessing short roughly diamond-shaped blade similar to the Gerar examples. The Sialk examples tend to be quite consistent in terms of material (all are bronze except for one unknown), size and shape, in which they resemble the Hasanlu examples. Only Sialk 22 is significantly larger than the others, with a blade of 7.4 cm.

The two Gerar examples are both iron, and though they are different sizes, they have similar profiles. Their shoulders are located approximately halfway up their blades, giving their profile a diamond shape, quite in contrast to the Sialk examples, which have small shoulders near the bottom of the blade. The Lachish example, also of iron, has very small shoulders far down on the blade, thus more closely resembling the Sialk examples in form. The example from Nush-i Jan is unfortunately too damaged to say much about, as its appearance of having angled shoulders may be the result of corrosion.

It would thus appear that Type 5a-2 type arrowheads were highly regional in their form, with one clearly defined variant being used at Hasanlu and Sialk, and a very different one at Gerar (though one would expect the Lachish example to resemble those from Gerar rather than those from Sialk). They appear to have been in use for most or all of the early 1st Millennium BC.

[107] For 2nd Millennium examples from Kamid el-Loz, see Miron 1990, pl. 14

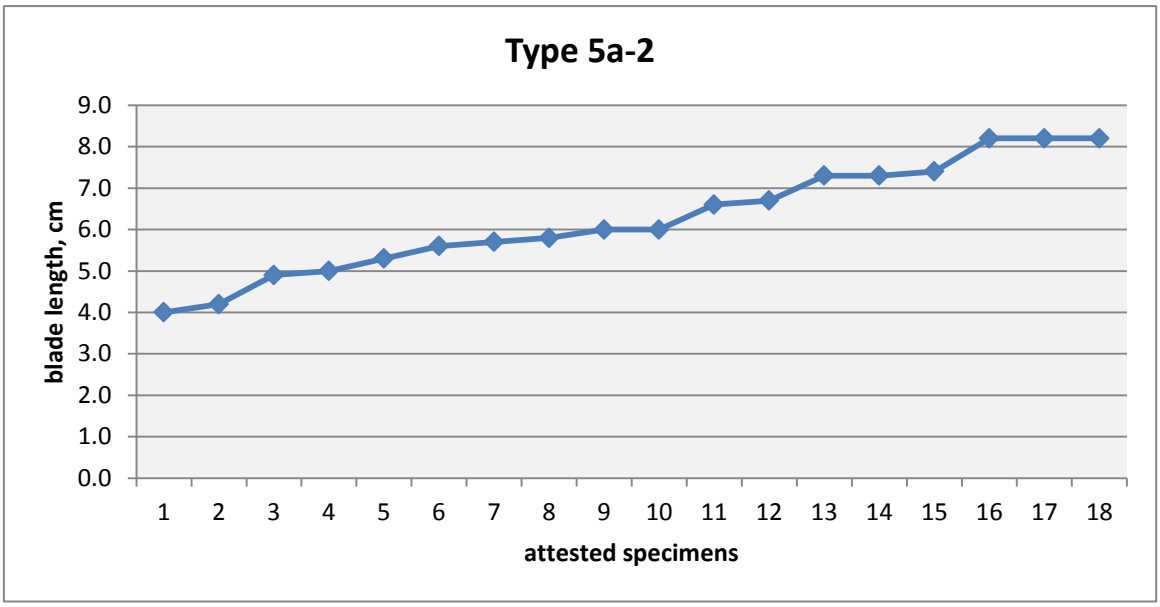

Figure 9.40: Sizes of Type 5a-2 arrowheads.

9.12.2.3. 5a-3 – lenticular leaf w/concave shoulders and unstopped tang

Like Type 5a-2, Type 5a-3 arrowheads exhibit a great deal of variation. Their blades range from a tiny 1.6 cm to a large 8.0 cm. The majority (5 examples) are bronze, nevertheless 3 are iron. This could be in part due to the prevalence of those from Sialk, where bronze arrowheads are relatively common. The other bronze example, from Marlik, may date to the late 2nd Millennium, when bronze was universal for arrowheads.

Sialk examples strongly resemble the Sialk Type 5a-2 arrowheads. Their blade lengths, from 6.5 to 8.0 cm, are compatible with the Sialk 5a-2s (5.7 to 7.4 cm), and their general shape, with fairly small shoulders, strongly resemble their Type 5a-2 relatives. Thus, it appears that both the Type 5a-2s and Type 5a-3s from Sialk are natural variation on a single form. The large size of Sialk 16 is noteworthy, however. Even in its broken state, it is 14.7 cm long. This suggests that it may have been intended for a thrown weapon, such as a javelin, rather than an arrow.

Also remarkable is Bastam 4, with its very tiny 1.6 cm spade-shaped blade on a relatively long tang. This arrowhead was not found in datable strata,[108] however its general profile is somewhat similar to that of Marlik 16 (Type 5g-4). There are, however, nearly identical 2nd Millennium BC arrowheads from central Anatolia. In particular, several dating to the "Hittite" period from Alaçahüyük resemble the Bastam example quite closely, though instead of the slight concave curvature of the lower part of the blades on the Bastam example, these have blades that end in a more or less straight line

[108] Kroll 1979, p. 158

perpendicular to the center line, or even have slight barbs.[109] A further barbed example was found at Boğazköy and dates to the Late Bronze Age (Büyükkale III).[110] It is therefore possible that Bastam 4 represents a continuation of a 2nd Millennium style.

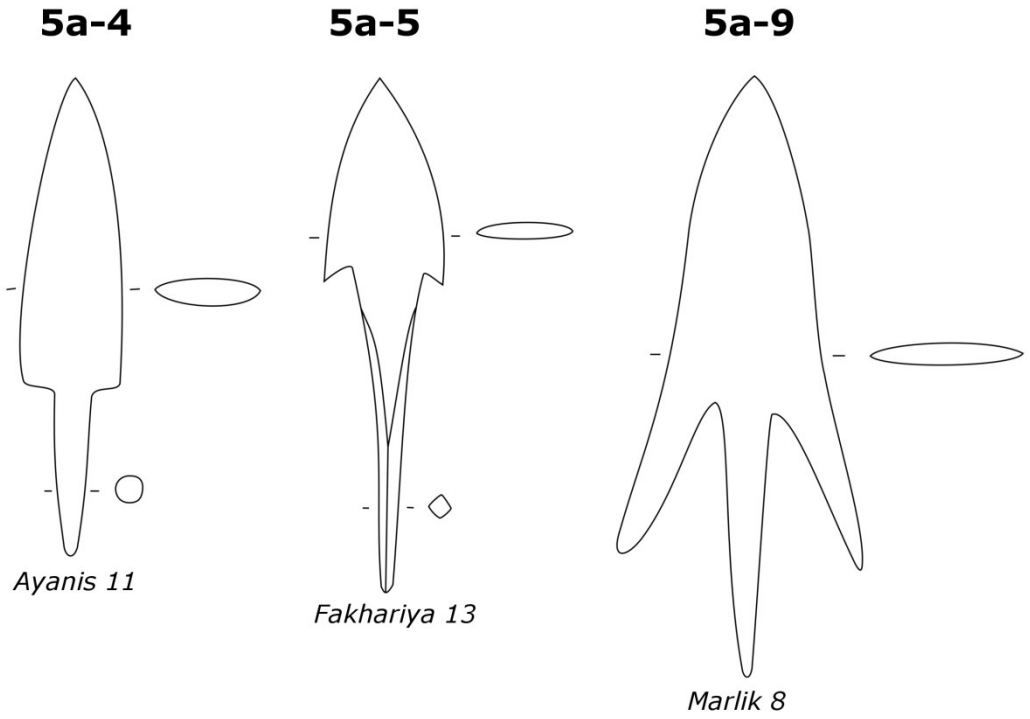

Figure 9.41: Types 5a-4 to 5a-9.

9.12.2.4. 5a-4 – lenticular leaf w/squared shoulders and unstopped tang

There are a total of five highly heterogenous Type 5a-4 arrowheads from the sites surveyed. The smallest three, Ayanis 11 Hasanlu 17, and Sialk 35, are the most similar. They have comparable blade lengths of 4.0 and 4.6 cm, respectively, and both are made of iron. Both Hasanlu 17 and Sialk 35 are in particularly poor states of preservation, thus the squared appearance of their shoulders may be the result of corrosion. Marlik 32 is not only somewhat longer, but also much wider and made of bronze. Sialk 36 is much larger than the others, with a blade of 11.2 cm, thus it may have been intended for a thrown weapons rather than an arrow. The metal with which it was made has unfortunately not been recorded.

As with Type 5a-3, the great variation of these arrowheads indicates that Type 5a-4 was, in fact, not a consistent type. Instead, the individual examples were the product of natural variation of Type 5a-1s. Indeed, only in the case of Marlik 32 is the squaring of the shoulders very pronounced.

[109] Erkanal 1977, pp. 53-54, pl. 18
[110] Boğazköy item 846; Boehmer 1972, p. 108 & pl. 28

9.12.2.5. 5a-5 – lenticular leaf w/barbed shoulders and unstopped tang

Type 5a-5 is represented by three examples, one from Fakhariya and two from Hasanlu. Fakhariya 13 has a small 2.7 cm blade with small but distinctly barbed shoulders. It is unclear if it was forged or cast from bronze. As Fakhariya 13 could be dated no more precisely than to the Iron Age, it may also belong to the later 2nd Millennium BC.

Hasanlu 64 and 40 are significantly different from each other, despite both coming from the Hasanlu IVB destruction layer. Hasnalu 64 has a fairly short 4.0 cm bronze blade but with long, distinct barbs, not unlike those of Hasanlu 42 (Type 5a-9) or Fakhariya 12 (Type 5b-5). Hasanlu 60, however, is iron and has a long 5.7 cm blade with proportionally much smaller barbs. Thus while the three Type 5a-5s share the same basic features, they do not appear to conform to the same ideal.

9.12.2.6. 5a-9 – lenticular concave swallowtail w/unstopped tang

The two Type 5a-9s are likewise rather heterogenous. Marlik 8 is clearly related to the other swallowtail arrowheads found at Marlik (see Types 5p-7 and 5p-8). Unlike them, however, Marlik 8 has a lenticular section, which is unusual in a bronze arrowhead and suggests that it was more likely forged than cast. Its somewhat uneven profile, while possibly the result of corrosion, could also be indicative of forging. It is also the sole example of a concave swallowtail from the sites surveyed. In fact, only the left side of the blade is markedly concave, while the right has more the appearance of a conventional swallowtail. Therefore, this could have been an attempt at forging a conventional swallowtail, and due to the natural variation that occurs when forming each artifact individually by hand, one side ended up with a greater degree of concavity than intended. It is also worth noting that this arrowhead is dated to the latter half of the 2nd Millennium BC or only the very beginning of the 1st Millennium BC, and therefore was quite probably manufactured before the period covered by this work.

Hasanlu 42, by contrast, is iron and dates to the 8th Century BC. It is also badly corroded, but Thornton & Pigott's reconstruction of its profile suggests that it has long barbs that only curve slightly outwards at their tips, in comparison to Marlik 8. Given that both examples come from Iran, Type 5a-9 may be a regional type, attested only in the earlier part of the early 1st Millennium BC.

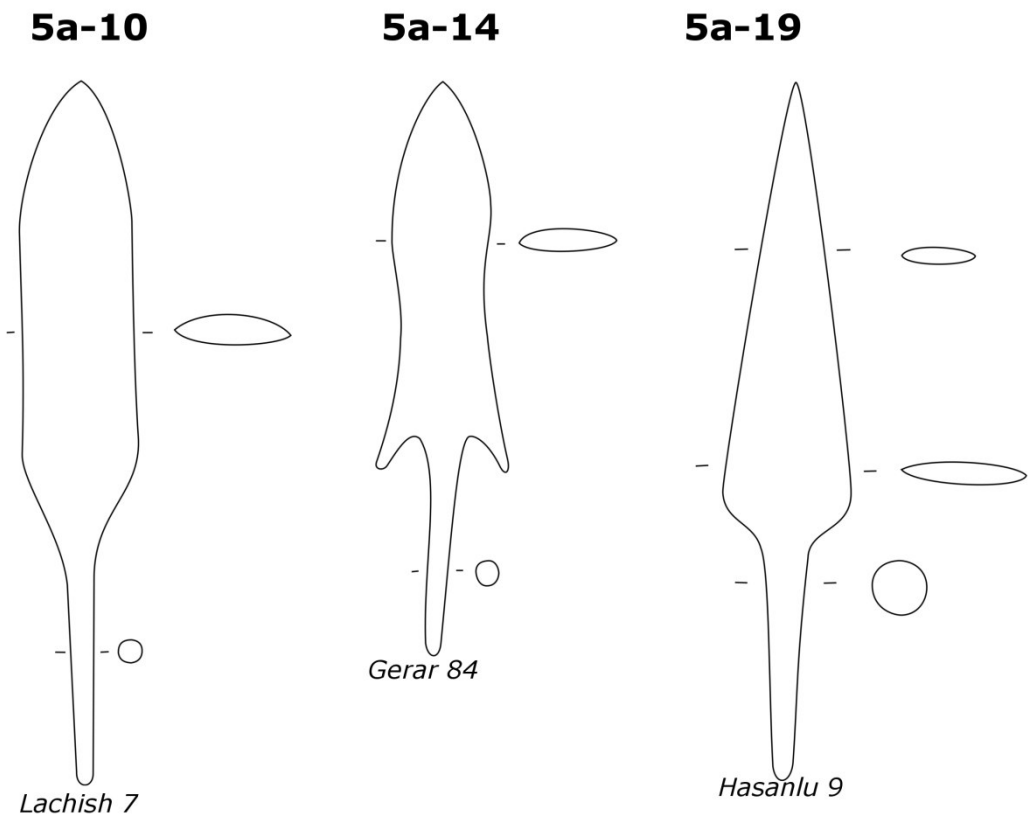

Figure 9.42: Types 5a-10 to 5a-19.

9.12.2.7. 5a-10 – long lenticular w/round shoulders and unstopped tang

The only Type 5a-10 is a poorly preserved example from Lachish dating to the 7th Century BC. As it is poorly preserved, its current irregular shape somewhat masks the original shape, making it difficult to determine how carefully it was originally forged. However, as long-bladed arrowheads are generally linked to Transcaucasia and this example is quite small compared to other long-bladed arrowheads, Lachish 7 is more likely a carelessly-made Type 5a-1.

9.12.2.8. 5a-14 – long lenticular w/barbed shoulders and unstopped tang

The two Type 5a-14s are from Gerar, and both are made of iron. The identification of Gerar 74 is quite uncertain, as the shoulder area of the arrowhead is missing. However, given that when long blades have a waisted appearance, they usually also have barbs, I have included it here even though Petrie reconstructed it with oddly rounded shoulders.

Unlike the Lachish 7 (Type 5a-10), Gerar 84 and 74 are clearly intended to be long-bladed arrowheads, as they exhibit the slightly concave sides that long-bladed arrowheads often have. Long-bladed arrowheads are rare outside of Transcaucasian sites, however there is one example from

Nimrud (Nimrud 250, Type 5z-14). Unfortunately, as the only two Type 5a-14s come from Gerar, nothing can be said of their dating.

9.12.2.9. 5a-19 – lenticular triangular w/round shoulders and unstopped tang

The single example of a Type 5a-19 is Hasanlu 9, dating to the 8th Century BC (Hasanlu IVB). While the reconstruction profile of the arrowhead is clearly triangular, with straight edges tapering to the tip from the round shoulders, the profile of the actual artifact is rather irregular due to corrosion, so this arrowhead may well actually be a Type 5a-1.

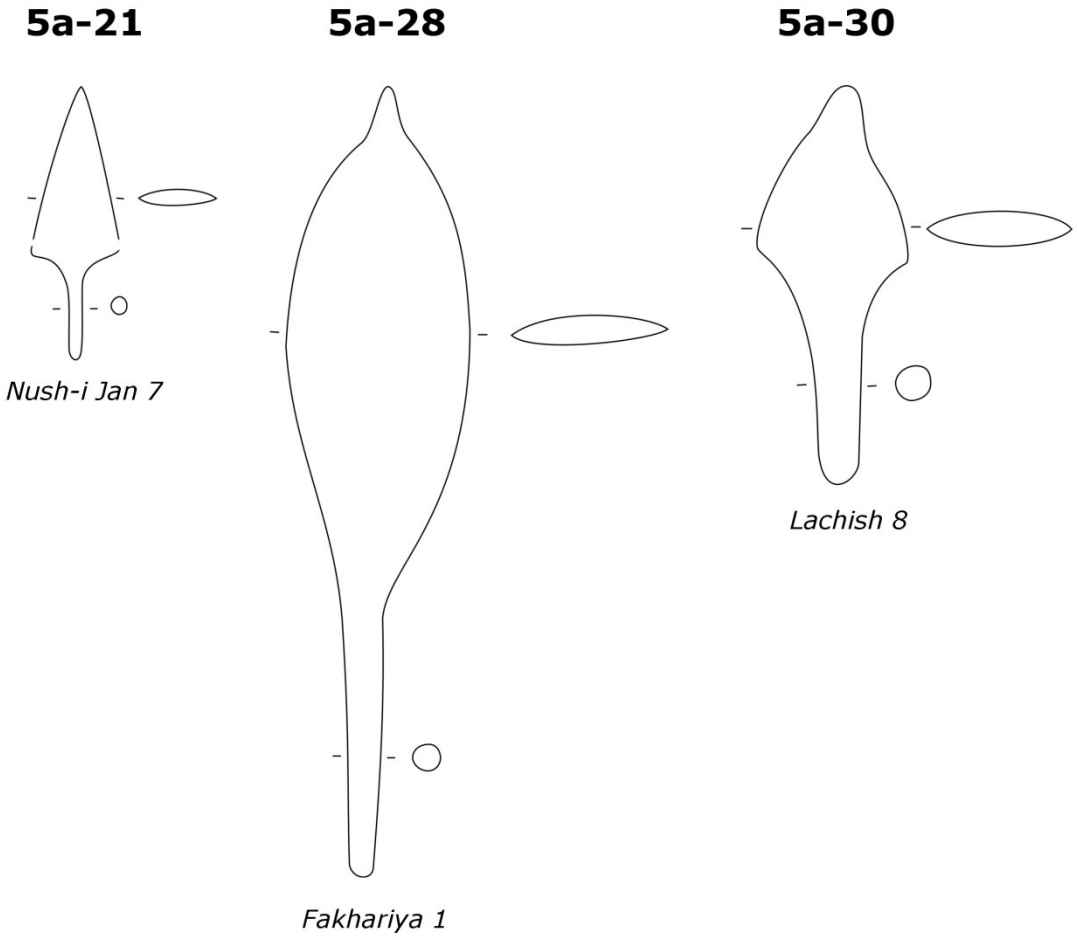

Figure 9.43: Types 5a-21 to 5a-30.

9.12.2.10. 5a-21 – lenticular triangular w/concave shoulders and unstopped tang

Two small 5a-21s are attested at Nush-i Jan. They date to the later Neo-Assyrian Period or somewhat after. They both appear to have been forged rather than cast due to their lenticular sections, which is

rather unusual given that both are made of bronze. Their shoulders are angled, but not in a very pronounced manner, so they may simply represent natural variation of Type 5a-1 arrowheads.

9.12.2.11. 5a-28 – lenticular ogee w/round shoulders and unstopped tang

Type 5a-28 is represented by five examples from Fakhariya (which constitute a full third of all arrowheads from that site) as well as a possible iron example from Lachish. The Fakhariya examples are all made of bronze and have comparable blade lengths from 6.0 to 8.4 cm. Lachish 87 is missing much of its tip, but the curves of the blade strongly suggest it originally terminated in a small ogee point.

The Fakhariya examples can be dated no more precisely than to the Neo-Assyrian Period, though the Lachish example is fairly early, dating to the 9th Century BC. Given that the Fakhariya examples are bronze, rather unusual for lenticular arrowheads in the early 1st Milennium BC, they most likely also date to the earlier part of the period. As similar arrowheads are well-attested in the Late Bronze Age,[111] Type 5a-28 represents a continuation of this form into the early 1st.

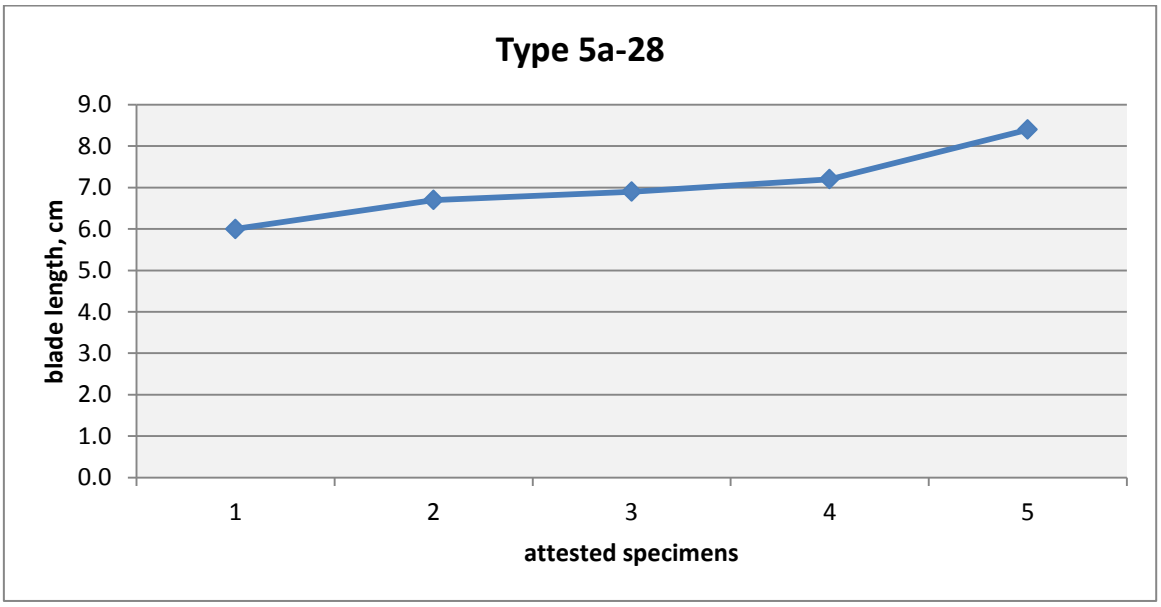

Figure 9.44: Sizes of Type 5a-28 arrowheads.

9.12.2.12. 5a-30 – lenticular ogee w/concave shoulders and unstopped tang

The sole Type 5a-30, Lachish 8, is a small iron arrowhead dating to ca. 700-600 BC. It is in a very poor state of preservation, and the ogoid appearance of the tip could very likely be the result of corrosion or other damage to a standard Type 5a-1, or could also be the result of sloppy workmanship on the part of the smith who made it. If this is not the case and the arrowhead was indeed deliberately

[111] For example, at el-Khadr in Palestine; see Cross & Milik 1956.

forged with the point in that shape, then Lachish 8 represents the latest attested ogee arrowhead among the sites surveyed.

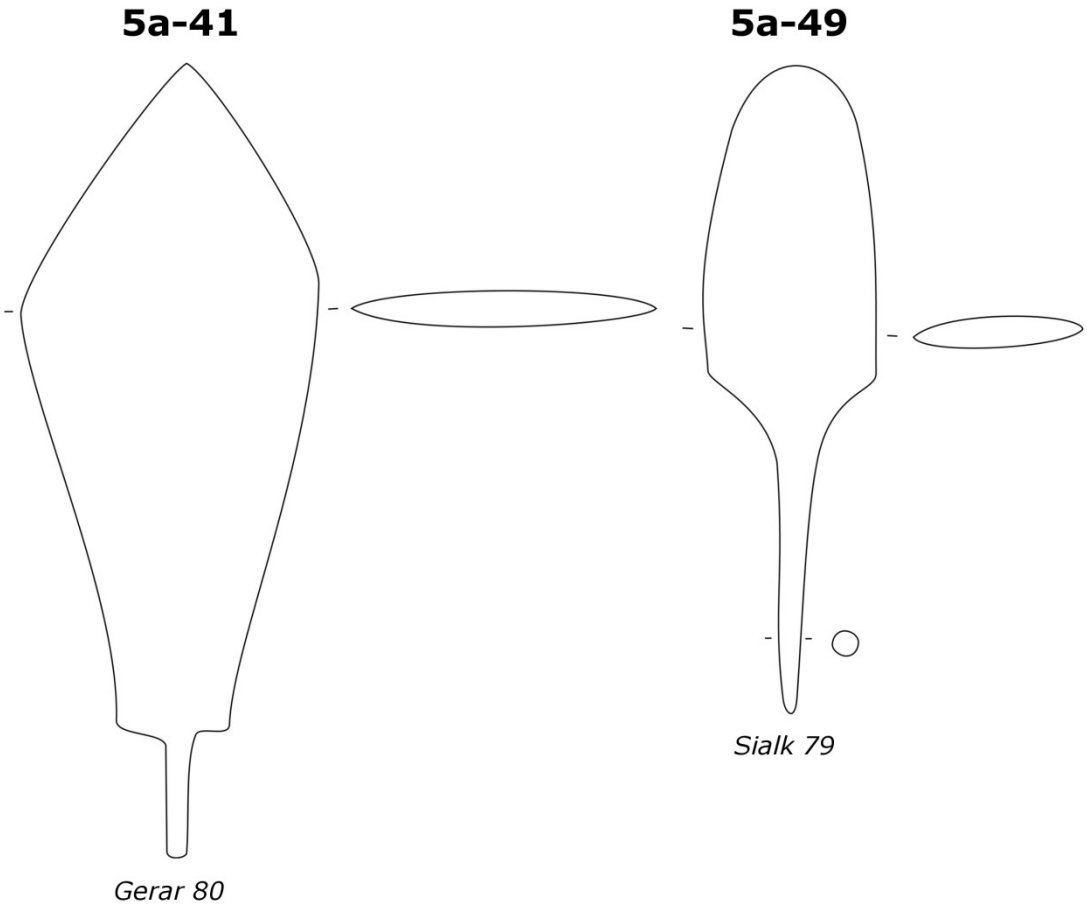

Figure 9.45: Types 5a-41 and 5a-49.

9.12.2.13. 5a-41 – lenticular pentagonal w/squared shoulders and unstopped tang

Only one Type 5a-41 is attested at the sites surveyed, Gerar 80. It is iron and has a remarkably wide blade, 3.9 cm, and tang seems disproportionately small for so large an arrowhead. Petrie observed that similar objects have been found in Egypt and speculated that they were spear heads used by Egyptians to bring down the horses of invading Scythians.[112] While they likely would have been effective against unarmored horses, as their great width would have caused considerable bleeding, their thin tangs do not seem suitable for use with spears. Furthermore, while on the large side, Gerar 80 does seem to still fall well within the range of sizes attested for arrowheads in the early 1st Millennium, though it could equally belong to a thrown weapon such as a javelin.

[112] Petrie 1928, p. 16

The dates of the finds from Gerar are, of course, uncertain (Petrie lists it as coming from an elevation of 200 feet, which corresponds to ca. 600 BC in Petrie's dating scheme[113]). However, a reasonably similar example was produced from the Bronze Age Cemetery A at Sialk, [114] which may suggest that Gerar 80 was a continuation of this form into the early 1st Millennium BC, using iron rather than bronze.

9.12.2.14. 5a-49 – lenticular rounded w/concave shoulders and unstopped tang

Type 5a-49 is represented by a single arrowhead, Sialk 79. It is similar to Type 5a-3, with concave shoulders, except that it does not come to a point. Instead, the tip of the arrowhead has a gentle curve. The reason for this is obscure, since it would clearly have more difficulty penetrating a target. Therefore, it could conceivably that the arrowhead was deliberately blunted in order to be used as a stunning bolt (see Type 1a-7), so that it could knock birds out of the air without piercing their flesh. On the other hand, it could have been an arrowhead whose tip broke off, after which rather than file it back down to a point, it was simply rounded off (which would require considerably less filing). The excavation report does not state the type of metal from which Sialk 79 is made, but regardless of whether it was bronze or iron, there are no similar arrowheads. Therefore, it is most likely that Sialk 79 represents a rare modification of a more common form of Type 5a arrowhead, perhaps done after the initial forging or casting of the object.

[113] Petrie 1928, pl. 5
[114] Ghirshman 1939, pl. 5:3

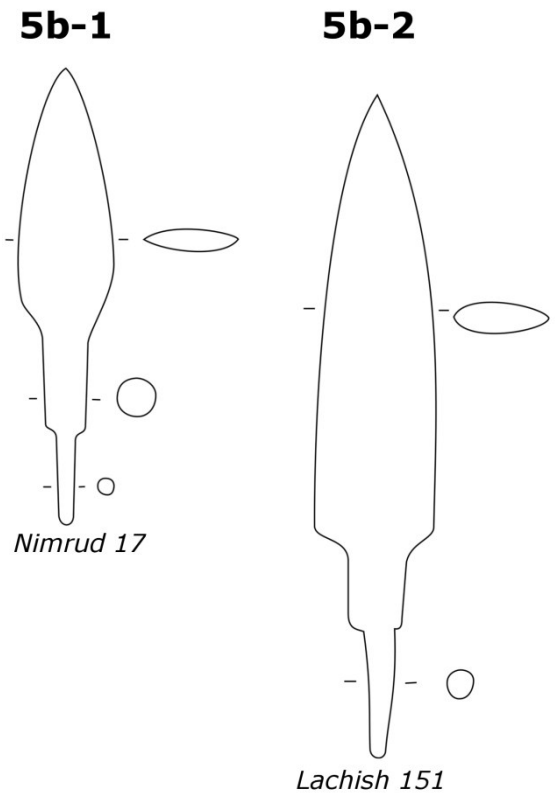

Figure 9.46: Types 5b-1 to 5b-2.

9.12.2.15. 5b-1 – lenticular leaf-shaped with stopped tang

With 340 examples, Type 5b-1 is the second most commonly-attested arrowhead among the sites studied, after Type 5a-1. The addition of a stop on the tang of Type 5b-1s adds somewhat to the complexity of their manufacture. However, it also makes the arrowhead more effective by reducing the likelihood that the arrow shaft would crack on impact. The stop provides a reasonably flat surface for the end of the arrow shaft to press against, transferring the momentum of the arrow shaft directly to the arrowhead and preventing the shaft from sliding up over the arrowhead, thus cracking the shaft and wasting the impact energy.

The 285 examples with intact blades have blade lengths from 2.2 to 9.0 cm (see Figure 9.48). However, the vast majority fall within the range from 3.2 to 7.2 cm, which is quite comparable to the blade lengths of unstopped Type 5a-1s (2.2 to 8.5 cm), and the majority are clustered around 5.0 to 5.5 cm (see Figure 9.47). Nevertheless, Type 5b-1s are on average somewhat larger than their unstopped counterparts. Only six Type 5b-1s have blades shorter than 3.2 cm, while 75 Type 5a-1s do. Furthermore, roughly half of the Type 5b-1s have blades longer than 5 cm, while roughly a quarter of Type 5a-1s do. Virtually all Type 5b-1s are made of iron; only 6 examples are copper or bronze.

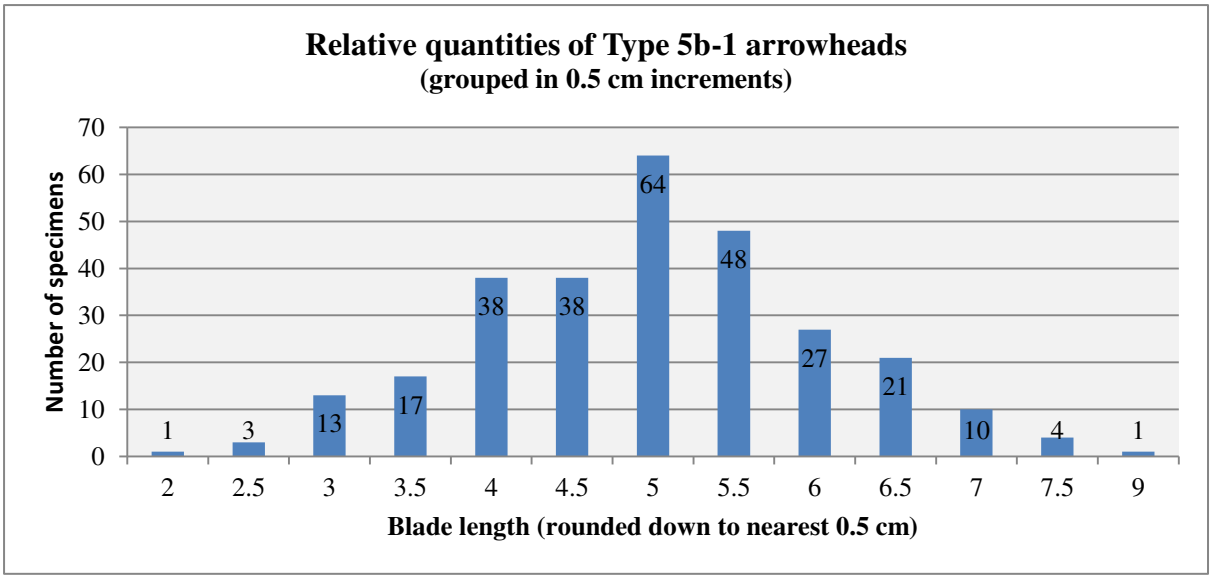

Figure 9.47: Relative quantities of Type 5b-1 arrowheads (lengths rounded down to nearest 0.5 cm).

The larger average size perhaps explains the presence of the stops. Because the arrowheads were larger and heavier, they would have been mated to heavier arrow shafts so as to maintain the balance of the arrow. These heavier arrow shafts would have more momentum upon impact, and therefore there would be a greater need for additional features to counteract the impact forces and prevent them from slipping forwards and cracking. Nevertheless, it should be noted that there are also examples of large unstopped Type 5a-1s (e.g. Sialk 57).

The four smallest 5b-1s all have very short blades, from 2.0 to 2.8 cm. Lachish 352 has a slightly waisted appearance, though this may be the result of corrosion. Lachish 32 and Uruk 13, however, have rather similar profiles. Assuming that when intact, Lachish 32 had a similar tang to Uruk 13, their overall length corresponds to other small 5b-1s (such as Gerar 82). Both exhibit an unusually short blade relative to the length of the arrowhead as well as the length of the stem, as does Lachish 348, though to a lesser degree. Long stems such as these mostly likely served a merely aesthetic purpose.

The largest collection of Type 5b-1 arrowheads comes from Lachish, with 199 examples. These have blade lengths from 2.2 to 9.0 cm, though most are concentrated between 4.0 and 7.0 cm, only somewhat larger that the Type 5a-1s from Lachish, which have blades primarily between 4.0 to 6.0 cm long. They weigh 2.0 to 20.7 grams, though most weigh between 4.5 to 12.6 grams. Most date to the 8th Century BC, and those that do are, for the most part, attributed to the Assyrian attack under Sennacherib by Gottlieb.[115]

[115] Gottlieb 2004, p. 1907

The second largest collection of type 5b-1s is the 50 examples from Nimrud. Their blades are 2.0 to 7.9 cm in length (with most falling between 3.3 and 6.0 cm) and they weigh from 2.5 to 24 grams (mostly concentrated between 3.5 to 13.5 grams, with a distinct larger group from 16.0 to 19.5 grams). These arrowheads date to the late 7th Century BC, associated with the fall of the city, which is generally assumed to have happened in 614-612 BC (see §8.3.1).[116]

The apparent homogeneity of the Lachish and Nimrud Type 5b-1s arrowheads in terms of size, shape and weight may encourage one to assume that they were made by the same group of people, namely the Assyrians (as attackers at Lachish and defenders at Nimrud). However, the Type 5b-1s from other sites also tend to conform to the same parameters, thus Type 5b-1 arrowheads appear to have had a more clearly-defined ideal form than other kinds of arrowhead.

This may have been imposed in part by the manufacturing technique used. It seems likely that in many cases, Type 5b-1s were forged from iron rods, not unlike the Type 5a-1s from Nimrud. The rod would have been the width of the stem. The blade would then have been flattened out of the upper part of the rod and the tang drawn out of the lower part and the middle part would be left the original width of the rod to form the stem. The drawings of the Type 5b-1 arrowheads from Bastam show particularly clearly how the stems were often substantially thicker than the blades. The width of the blade was thus partly determined by the thickness of the original rod, since there would only be a certain amount of metal to flatten and spread out to form the blade.

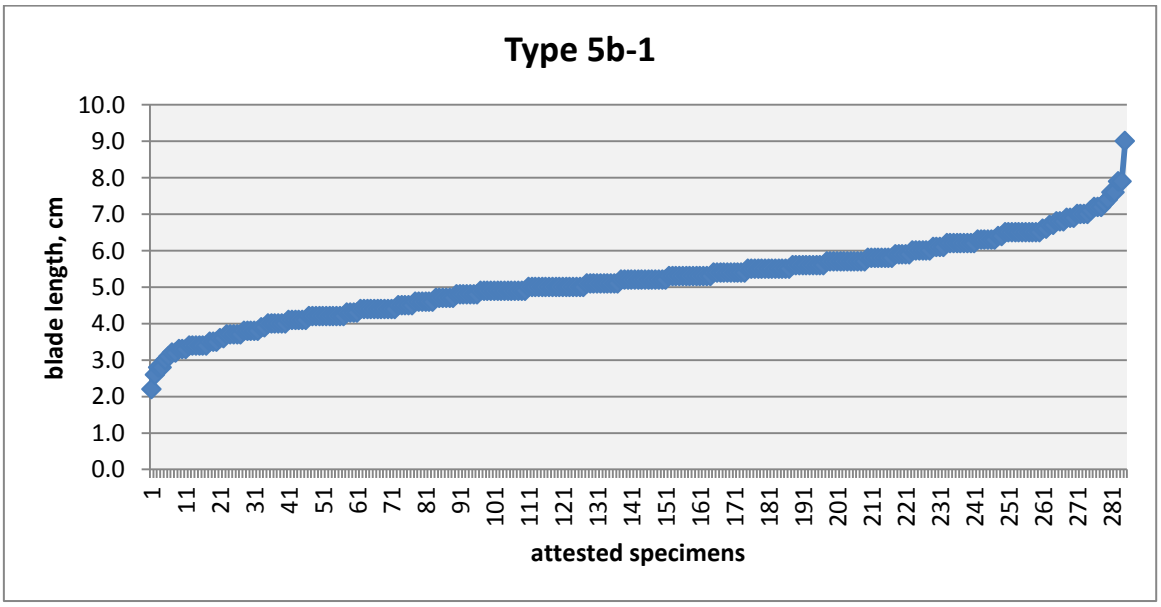

Figure 9.48: Sizes of Type 5b-1 arrowheads.

[116] e.g. Stronach 1958, p. 171

A number of Type 5b-1 arrowheads have forms unlike the majority of the others. Ayanis 68 has a very short blade (only 3.3 cm) mounted on an unusually long tang with a minimal stop. Lachish 32, Uruk 13, Lachish 37, Uruk 4 and Uruk 6 all have unusually long stems, however most of the variation among type 5b-1 arrowheads is in the relative width of the blade, and whether it is widest near the bottom or the middle.

Type 5b-1 arrowheads were clearly a popular form, attested across the Near East and throughout the early 1st Millennium BC. The vast prevalence of iron examples is doubtless a result of the lenticular section (or perhaps vice versa), since forging lenticular sections is comparatively straightforward.

9.12.2.16. 5b-2 – lenticular leaf w/angled shoulders & stopped tang

The sole example of a 5b-2 comes from Lachish and dates to the 8th Century BC. Despite its heavy corrosion, Lachish 151 does appear to have distinctly angled shoulders. Nevertheless, due to its rarity, this Type 5b-2 most likely represents natural variation of a Type 5b-1.

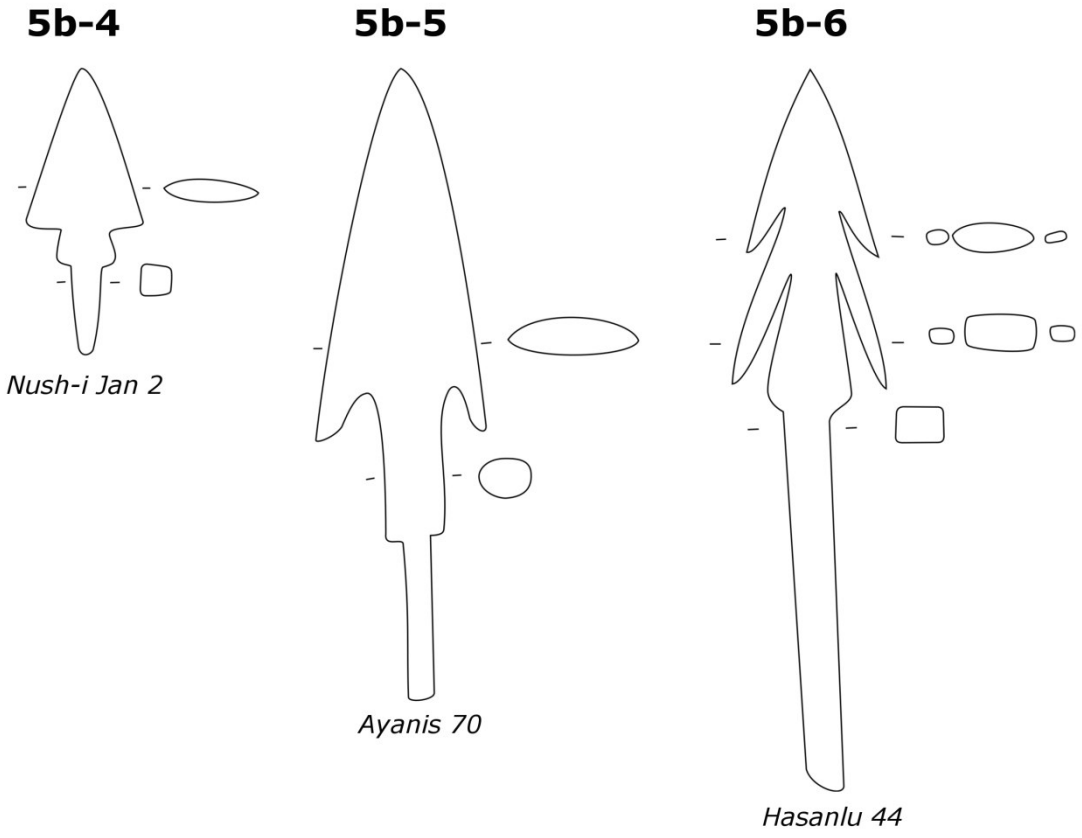

Figure 9.49: Types 5b-4 to 5b-6.

9.12.2.17. 5b-4 – lenticular leaf w/squared shoulders & stopped tang

The sole Type 5b-4 is a badly preserved iron example from Nush-i Jan, dating to ca. 700-500 BC. Due to its state of preservation, little can be said about it except that the one surviving squared shoulder does not appear to be very sharply squared, and so Nush-i Jan 2 may simply represent a natural variation on a Type 5b-1.

9.12.2.18. 5b-5 – lenticular leaf w/barbed shoulders & stopped tang

Barbed shoulders are rather more common on ribbed arrowheads, but there are some examples on those with lenticular sections. They are attested only in Iran, Transcaucasia, and Syria, dating from the 8th Century BC to the end of the Neo-Assyrian Period. The four attested type 5b-5 arrowheads all have blades of similar sizes, from 4.1 to 4.4 cm. Their forms, however, are quite heterogenous. Hasanlu 41 is made of iron, has a thick stem and pronounced stop and fairly conventional barbs, roughly one third the length of the blade. Hasanlu 43, also iron, has a distinctly waisted blade, making the short barbs more pronounced. It has both a thick stem and a thick tang.

Fakhariya 12 is made of bronze and has shoulders which curve in gently until they reach their bottom points. The inner sides of the barbed shoulders are vertical, which is unique among all the arrowheads surveyed. The stop is difficult to see because remains of the arrow shaft are still attached to the tang. It is indicated by a slight bulge just below the points of the barbs, resulting in a stem 1.6 cm long. Below that bulge, the profile of the artifact becomes much more irregular because it is not solid metal but rather decayed reed shaft saturated with corrosion products from the arrowhead. Once the remnants of the shaft are taken into account, it becomes clear that Fakhariya 12 was a carefully made arrowhead, with decorative features such as the carefully vertical barbs and the slight bulge demarcating the stop.

Ayanis 70 is made of iron, and its identification as a Type 5b-5 is less certain. Like Fakhariya 12, its tang appears to still be encased in remains of the arrow shaft, however where the shaft remnants end and the stop begins is much less clear here. It appears that the stem was most likely 1.8 cm long, for below that point the profile appears somewhat rougher and bent slightly to one side. The profile of the blade is also markedly different from Fakhariya 12, since the barbs follow the curve of the blade, with the result that they appear to point away from the arrowhead at an angle rather than pointing straight down.

Due considerable disparity in form of these four arrowheads indicate that Type 5b-5 was not a consistent type, with all examples derived from a common ideal, but the result of independent developments combining the same features.

9.12.2.19. 5b-6 – lenticular leaf w/double barbed shoulders & stopped tang

Type 5b-6 is represented by a three examples, all from Hasanlu level IVB, dating to the 8th Century BC.[117] Hasanlu 44, 45 and 46 are all are made of iron and have very consistent blade lengths, all 3.8 cm, suggesting that they may have a common origin. A bronze ribbed double barbed arrowhead, Marlik 41, is also similar in size, with a blade length of 4.1 cm (see Type 5q-6). The upper portion of each resembles a conventional barbed arrowhead, but a second pair of barbs project from the core of the arrowhead immediately below the first. The reconstruction of the profile of Hasanlu 46 (and to a lesser degree, hasanlu 45) suggests that the second pair of barbs may have been a full second blade below the first, and thus qualify as a Type 7 arrowhead. However, the area where the two sections join on the reconstruction appears too frail to have ben practical for an arrowhead, and the outline showing the profile of the artifact as preserved suggests that the lower barbs merged into a considerably broader area, thus the reconstruction is somewhat dubious and the probability is that Hasanlu 46 is indeed a Type 5b-6.

The purpose of the double barbs may have been to increase the likelihood that at least one set of barbs would catch in the flesh of the target when attempting to withdraw it from the wound. It may have been thought desirable to have one pair of barbs nearer the tip, in case the arrow did not penetrate the target very deeply, and a second pair farther down to hold the point in deeper should it be able to penetrate that far, and thus cause further damage in attempts to extract it. Both sets of barbs are in the same plane, however, which would have limited any cumulative benefit. If the arrow was draw out carefully enough to prevent one set of barbs from catching, then likely the second could also be withdrawn. As this form of arrowhead is quite rare compared to those with the usual single pair of barbs, it may be inferred that the second pair of barbs was discovered to have little utility.

[117] A very similar undated example, also of iron, was found at Boğazköy; Boehmer 1972, p. 154, pl. 54:1610D.

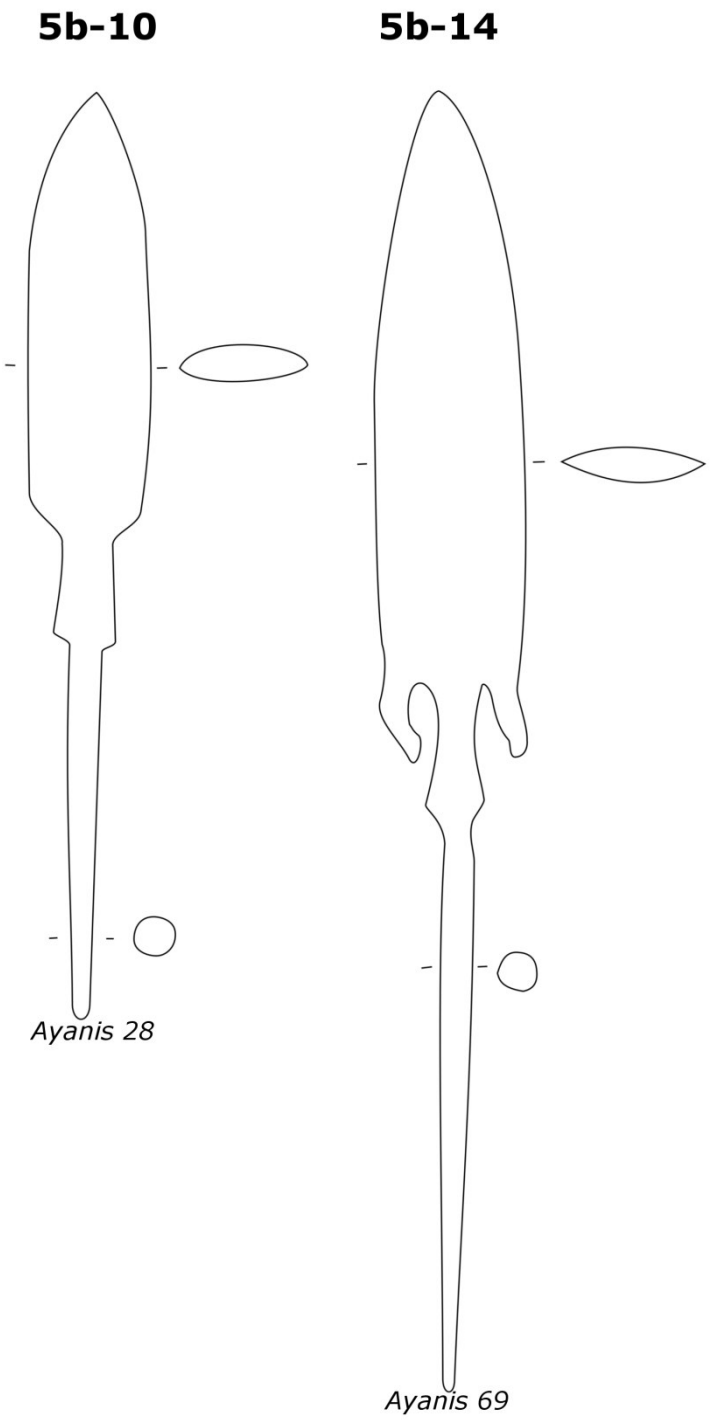

Figure 9.50: Types 5b-10 and 5b-14.

9.12.2.20. 5b-10 – long lenticular w/round shoulders & stopped tang

Ayanis 28 is the one example of a type 5b-10 from the sites surveyed. While barbs and double stops tend to be more commonly associated with long blades, Ayanis 28 has a single stop and clearly rounded shoulders. It can be regarded as a natural variation (or simplification) of the more elaborate

Type 5d-14. Similar arrowheads (though with squared shoulders and therefore Type 5d-13) have been found at other Transcaucasian sites, such as Çavuştepe[118] and Karmir Blur.[119]

9.12.2.21. 5b-14 – long lenticular w/barbed shoulders & stopped tang

Ayanis 69, the sole example of a Type 5b-14 among the sites surveyed, appears to be close kin to Type 5d-14. It has a long blade, very long tang and distinctly barbed shoulders, however where the 5d-14 has a double stop, Ayanis 69 appears to have a single stop. It is nevertheless possible that it originally did have a double stop which has been subsequently obscured by corrosion. In any event, it appears to be a variant of the Type 5d-14, if not an actual example of a Type 5d-14.

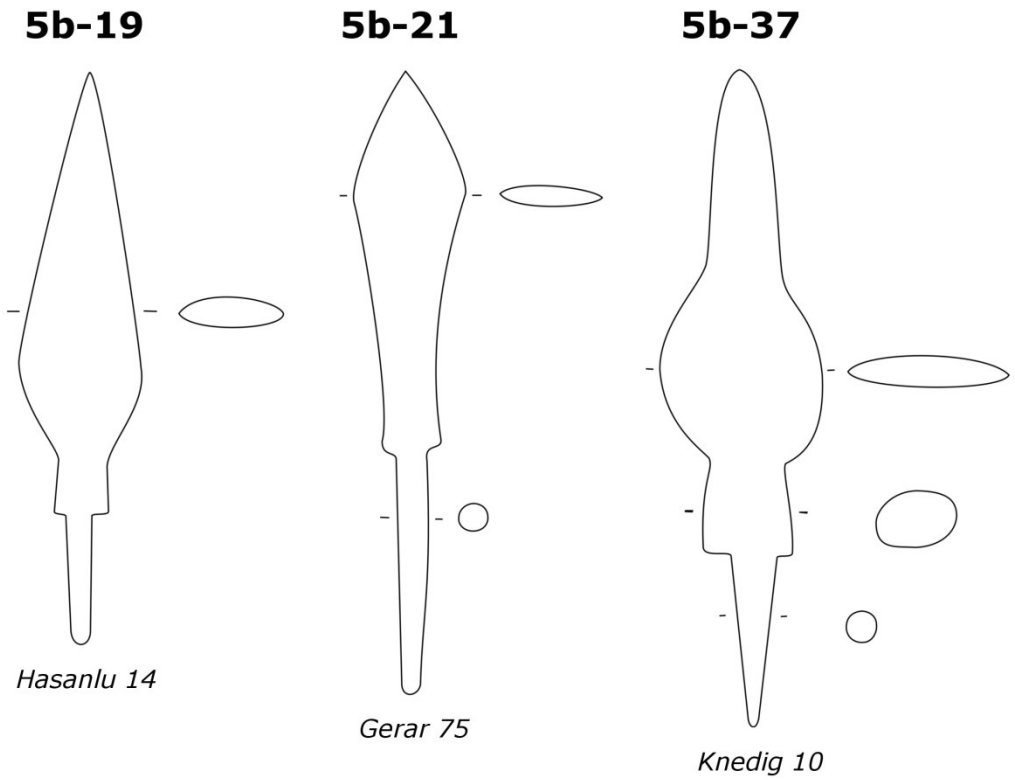

Figure 9.51: Types 5b-19 to 5b-37.

9.12.2.22. 5b-19 – lenticular triangular w/round shoulders & stopped tang

Hasanlu 14, dating to the 8th Century BC, is the sole example of a Type 5b-19 among the sites surveyed. Despite some corrosion, the 4.8 cm long iron blade does exhibit a fairly clear triangular profile, though due to the rarity of the form, it may well be the result of natural variation of the far more common Type 5b-1.

[118] Erzen 1978, p. 55, fig. 40:4
[119] Piotrovsky 1970, unnumbered plate at the end of the Russian section, the second arrowhead from the top on the right column.

9.12.2.23. 5b-21 – lenticular triangular w/concave shoulders & stopped tang

The sole 5b-21, Gerar 75, has a reasonably small 5.1 cm blade with a curious profile. The upper portion has fairly straight edges, but is very short, a mere 1.6 cm, while the concave shoulders extend a full 3.5 cm. There is no apparent reason for this, though the effect of moving the shoulders up towards the tip would be to make the point more obtuse than it would otherwise be. This would tend to make it more difficult for it to penetrate a target, but on the other hand, it would make the tip of the blade stronger and less likely to break.

9.12.2.24. 5b-37 – lenticular extended ogee w/round shoulders & stopped tang

Extended ogee arrowheads are very rare, attested among the sites surveyed only at Tell Knēdiğ and possibly at Carchemish (the advanced corrosion of Carchemish 28 makes its identification uncertain; it could be a badly damaged 5b-1). The Tell Knēdiğ examples are all dated to the Neo-Assyrian Period; that from Carchemish is from the very end of the 7th Century BC. A further example from Boğazköy[120] dates to the late Phyrgian period (Büyükkale I), [121] which also suggests that extended ogee arrowheads were used near the end of the Neo-Assyrian Period (and perhaps for some time afterwards).

The upper half of the extended ogee arrowhead consists of a relatively long and narrow blade, below which is a wider section that is nearly circular. In that they have a narrower tip on a wider body, they bear a vague resemblance to ogee arrowheads, however it is not possible to say if there is a direct relationship.

The method of fastening the arrowhead to the shaft is open to debate, however. Martin states that the all three Knēdiğ arrowheads had sockets, and all had the remnants of wooden shafts protruding from those sockets.[122] However, sockets on iron arrowheads are extremely rare. Furthermore, what is identified as the remains of arrow shafts are much smaller in diameter than the sockets. Stopped tangs often have a considerable disparity in the diameter of the stem versus the tang, in order to ensure that a wide flat surface is provided for the end of the arrow shaft to rest against. Other arrowheads where the remains of shafts are present indicate that some of the original diameter of the arrow shaft may be lost (perhaps as the outermost surface would likely rot away before the fibers of the reed could be impregnated with iron oxide, thus preserving them),[123] which could also be the case here. Indeed, were the arrowheads socketed, it would be highly improbable that such a length of arrow shaft would

[120] Boehmer 1972, p. 152 & pl. 51
[121] Genz 2004, p. 9
[122] Klengel-Brandt *et al* 2005, p. 306
[123] A number of example of such are known from Ayanis; see Derın & Muscarella, fig. 6:89-90

be preserved. The portion of the arrow shaft within the socket might be preserved due to being surrounded by corroding metal, but the shaft outside the socket would not have the benefit of being in direct contact with a source of iron oxide. A tang inside the arrow shaft itself, however, would be able to leech corrosion products into the length of shaft encasing it, leaving a visible segment of preserved arrow shaft.

Adding to the evidence against the Knēdiğ examples having sockets, Boehmer clearly states that the Boğazköy example has a stopped tang, further specifying that the tang itself has a square section (thus essentially eliminating the possibility that a fragment of rust-impregnated arrow shaft was mistaken for a tang).[124] There is, of course, the possibility that those from both sites share the same blade form, but have different methods of attachment, however one must speculate that perhaps Martin was misled by the admittedly unusually wide stops on the tangs of those from Knēdiğ into believing that they were the bases of sockets, a misidentification made all the easier due to the advanced state of corrosion of the arrowheads in question and the likely presence of traces of the arrow shaft remaining on the tangs (the photos are not clear enough to make out this detail). A careful re-examination of Knēdiğ 10, 11 and 12 would be necessary before making any definitive conclusion, however. Should they indeed prove to be socketed, then a new Type 2 designation would have to be added to the typology (bilobate with long socket and *circular* shoulders).

The reason for the unusual blade form could have been an attempt to make the arrowhead have a more multi-purpose functionality. The narrow forward part of the blade would help aid penetration of the target, allowing the arrow to pierce better protected targets, however if the target was "soft" enough to allow easy penetration, then the lower section of the arrowhead could also enter the target, creating a much larger wound, and therefore considerably more bleeding.

[124] Boehmer 1972, p. 152

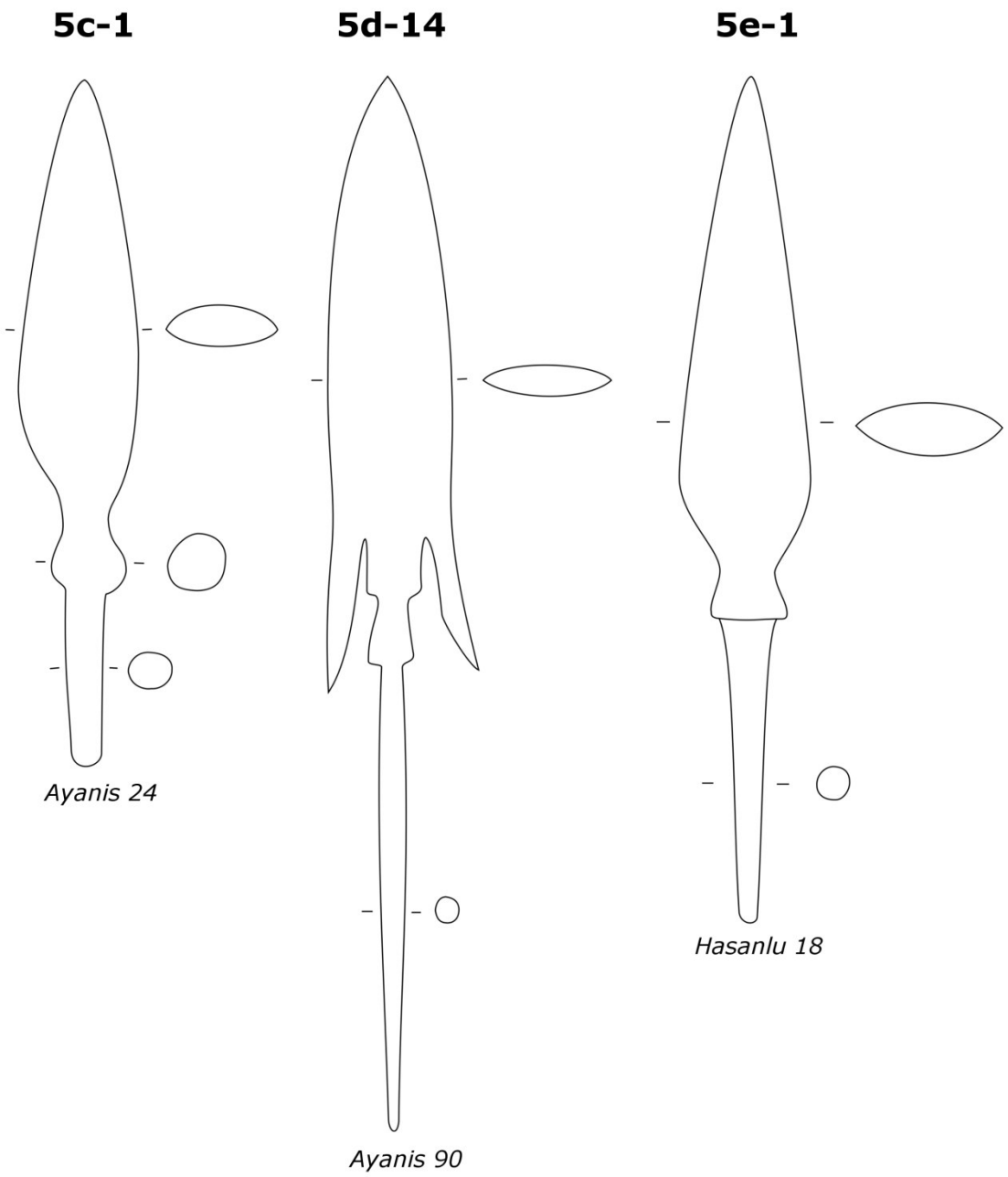

Figure 9.52: Types 5c-1 to 5e-1.

9.12.2.25. 5c-1 – lenticular leaf w/bulbous stop

Five arrowheads, all from Ayanis exhibit distinctly bulbous tangs on what would otherwise be normal Type 5b-1 arrowheads. Their blade lengths, 3.8 to 5.5 cm, are comparable to smaller Type 5b-1s. Though they are all similar in size, they still strongly exhibit two groups, as two have blades of 3.8 cm and the remaining 3 are 5.3 to 5.5. These two groups could represent different standard weights of arrowheads, with the lighter ones for longer range and the heavier ones for greater penetration ability. However, as their weights are unknown, this can only be speculated upon.

The bulbous stop is more commonly associated with ribbed arrowheads (Type 5r), so their presence on lenticular arrowheads is curious. If the bulbous stop served a purpose beyond decoration, it may have been to provide the arrowhead with a wider stop so as to enable the use of an arrow shaft with a wider diameter, thus making a heavier arrow.

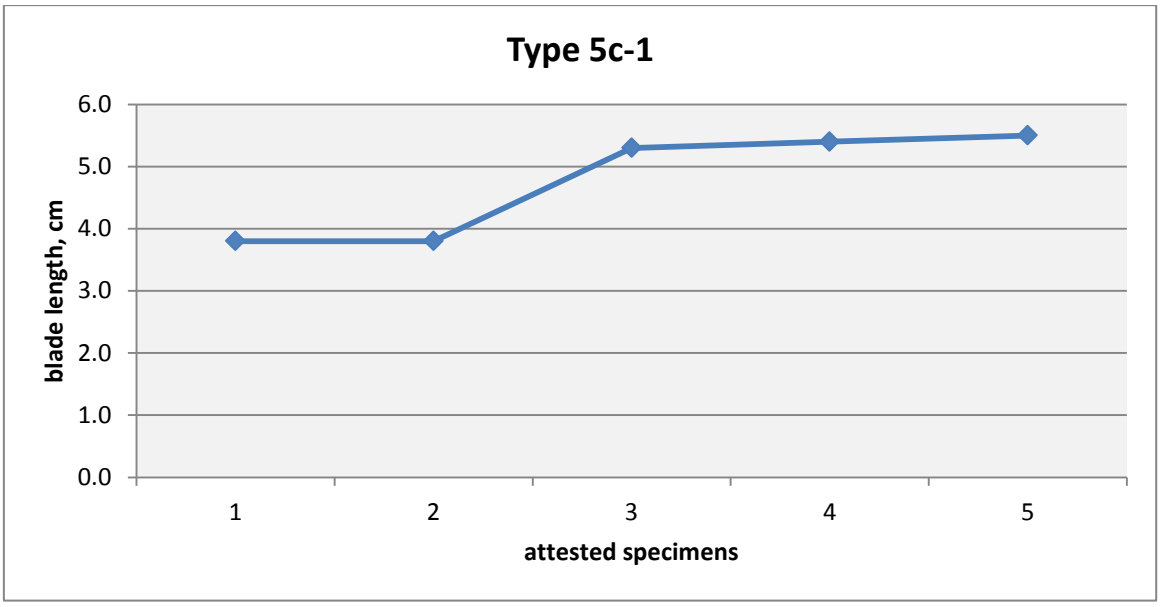

Figure 9.53: Sizes of Type 5c-1 arrowheads.

9.12.2.26. 5d-14 – long lenticular w/barbed shoulders & double stop

The sole example of a Type 5d-14 arrowhead among the sites surveyed is Ayanis 19. However finds at sites such as Çavuştepe[125] and Karmir Blur (where an entire quiver of them were found[126]), suggest that this was a reasonably common form of arrowhead in Transcaucasia. Ayanis 19 has gently outward-curving barbs, which gives its long blade the appearance of being slightly concave or 'waisted.' The double stop is distinctive, but the upper 'stop' must have served an aesthetic function, since the lower stop would have done the job of preventing the shaft from slipping forward on impact. The remarkable length of preserved arrow shaft most likely contains an equally long tang (comparable with other long-bladed arrowheads).

Ayanis 19 has a reasonably acute point, for ease of penetration, but the length of the arrowhead demonstrates that its primary objective was to put a great deal of weight behind those points, like a bodkin, only wider and with cutting edges. Therefore, Type 5d-14 was probably intended a combat arrowhead, and would likely have been reasonably effective against armored soldiers. The length of

[125] Erzen 1978, p. 55, fig. 40:1-3
[126] Piotrovsky 1970, unnumbered plate at the end of the Russian section; also see Seidl 2004, p. 91

the blade does, however, mean that the arrowhead would have to penetrate the target very deeply in order for its barbs to be able to catch in the wound.

Type 5d-14 is very similar to, and certainly directly related to, Type 5z-14. Both types are closely associated with Transcaucasia and, due to the care with which they were made,[127] appear to have been high-status implements. Indeed, one iron arrowhead from Karmir-Blur has an inscription naming the Urartian king Sarduri II,[128] indicating that it was either the personal property of the king or used by individuals with a special connection to him (such as his royal guard).

9.12.2.27. 5e-1 – lenticular leaf w/round shoulders and wide stop

Dating to the 8th Century BC, Hasanlu 18 is the only example of a Type 5e-1 among the sites surveyed. While its iron blade is a moderate 6.5 cm long, it is quite narrow, giving it a nearly triangular appearance. The wide stop is clear and well-defined.

[127] for multiple examples, all showing a high level of craftsmanship, see Piotrovsky 1969, pl. 83
[128] Azarpay 1968, p. 26

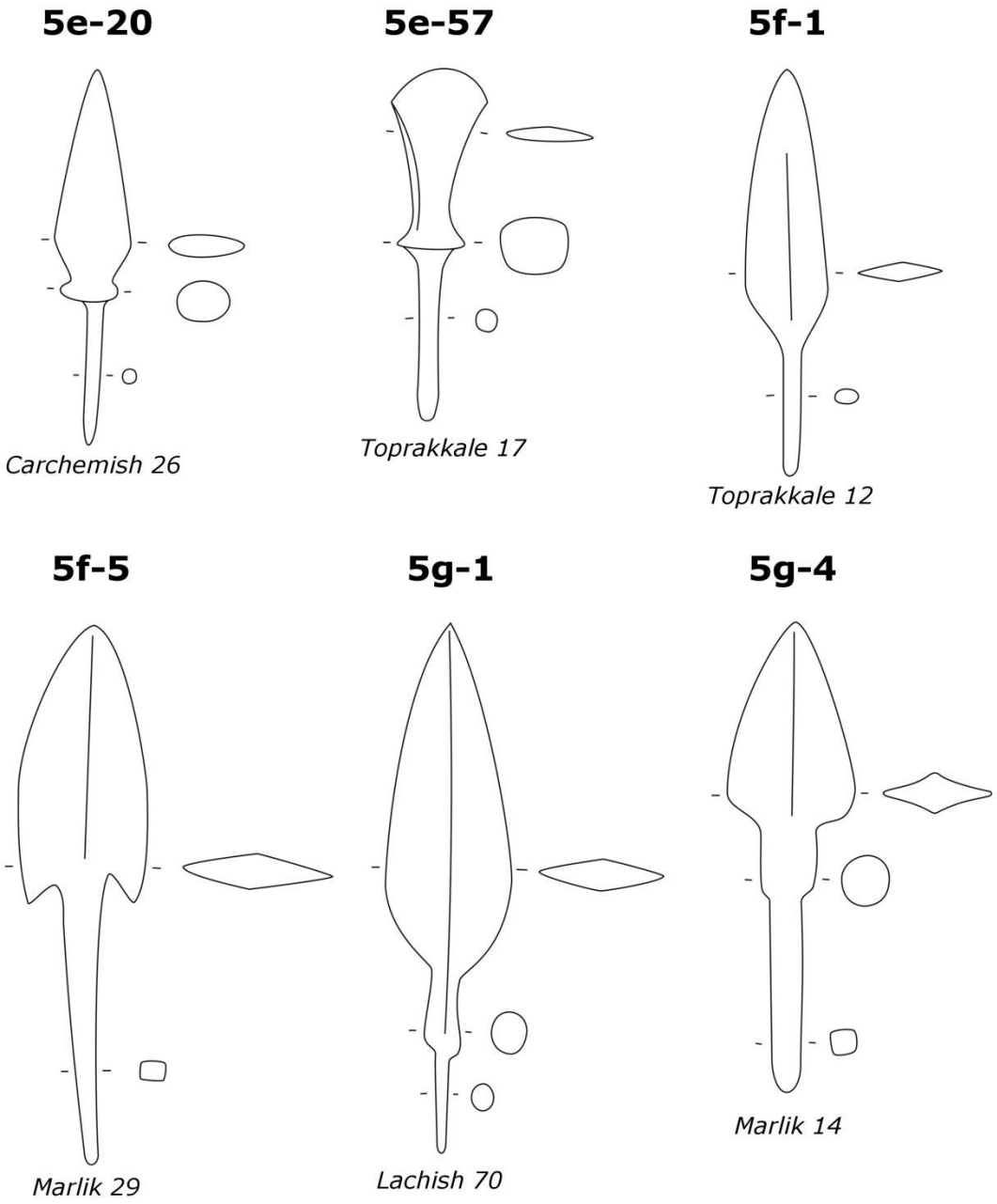

Figure 9.54: Types 5e-20 to 5g-4.

9.12.2.28. 5e-20 – lenticular triangular w/angled shoulders & wide stop

The Type 5e-20s consist of two very similar pairs of arrowheads. Two small examples come from Assur. Both are made of bronze, and the length of their blades is nearly equal to the length of their shoulders, giving them a distinctly diamond or lozenge shaped profile. Their date is uncertain.

The two iron Type 5e-20s both come from House D at Carchemish. Carchemish 26 and 25 are relatively small arrowheads, with blades of 2.8 and 3.2 cm, respectively. They weigh 5.0 and 7.5 grams, which is rather heavy compared to Type 5a-1s with similar blade lengths. Their shoulders are

smaller and narrower than the Assur examples, resulting in arrowheads which appear longer and thinner. Indeed, the shoulders of Carchemish 25 are scarcely more than notches at the base of the blade. The more acute angle of the Carchemish examples may have helped them penetrate their targets, in much the same way as bodkins, while the resulting wound would be smaller than those produced by the Assur examples.

Very similar examples have been found at other sites. Six similar iron examples come from Boğazköy (see Figure 9.55),[129] one nearly identical bronze example was found at Norşuntepe (see Figure 9.56),[130] and another bronze example with a more conventional blade but with a stop very similar to the Carchemish examples (thus Type 5e-2) was found at Olynthus.[131] However, frustratingly, all of these arrowheads were surface finds or otherwise undatable. Schmidt suggested a Hellenistic date,[132] which is supported by finds from Hellenistic sites. Nemrud-Dağı produced two examples, and while they were not stratified, they came from a clear Hellenistic context,[133] and Arsameia on the Nymphaios produced two more that were reliably dated to the Hellenistic period.[134] Therefore, it is most probable that the Assur examples are also Hellenistic in date. The destruction layer in House D at Carchemish dates to the late 7th Century BC, so the presence of two 5e-20s, very similar to Hellenistic examples, suggests that either these two arrowheads are later intrusions, or that this distinctive form of arrowheads was in use for at least several centuries. The possibility that the Carchemish were early versions of this form of arrowhead is suggested by the minimal angled shoulders. The shoulders of the Hellenistic examples tend to be large and well-defined.

Stronach considered this form of arrowhead the middle step in development of wide-stopped arrowheads, which he regarded as starting with conventional blades with concave shoulders (Type 5y-3) and ending with chisel-tipped arrowheads (Type 5e-57).[135] This chronological order is based on the dating of an arrowhead from Sakçegözü (roughly 50 miles northwest of Carchemish) with concave shoulders and a wide stop (Type 5e-3) to the late 7th Century BC, [136] and the apparent Hellenistic date of the other examples. However, the Sakçegözü excavation report makes it clear that the stratum in which it was found was very thin and heavily disturbed by later intrusions,[137] therefore

[129] Boehmer 1972, nos. 1603-1605, p. 154, pl. 53 and Boehmer 1979, nos. 3485-3487, p. 36, pl. 22
[130] Schmidt, K. 2002, no. 628, p. 53, pl. 49
[131] Robinson 1941, no. 1893, p. 379 & pl. 120
[132] Schmidt, K. 2002, p. 53
[133] Stronach 1996, p. 47, no. 2 & 3; fig. 611:2 & 3; figs. 613 & 614. Stronach considers nos. 2 & 3 to be different types because the shoulders of no. 2 are halfway up the blade, whereas those of no. 3 are near the bottom. Because of this, he associates no. 3 with no. 1. However, no. 1 has clearly concave shoulders and a distinct convex curvature to the blade edges, quite unlike no. 3. According to the typology presented here, nos. 2 & 3 are both clear Type 5e-20s, based on their distinct features, while no. 1 is a Type 5j-3.
[134] Stronach 1963, pl. 73, nos. 10-11
[135] Stronach 1996, p. 475-476
[136] du Plat Taylor *et al* 1950, p. 123, fig. 33:1
[137] du Plat Taylor *et al* 1950, p. 82

the dating of the artifact is suspect. In fact, wide stops appear at a far earlier date on chisel-tipped points (see Type 5e-57), and the earliest reasonably securely dated adaptation of wide stops to more conventional arrowhead blades are the examples from Carchemish, a site which has yielded another innovation in arrowhead design, namely the quadrilobate. It is worth noting, however, that the stops of the Carchemish examples are somewhat thinner and less pronounced than those of the Assur examples (or those from other sites, such as Nemrud-Dağı). This could suggest that the development of the wide-stopped arrowhead was not directly related to the previous wide stop used on chisel-tipped arrowheads, and only later was the wide stop enlarged, perhaps in order to make it resemble those used on chisel-tipped arrowheads.

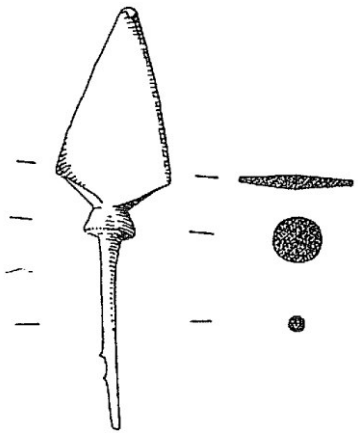

Figure 9.55: Undated Type 5e-20 from Boğazköy; after Boehmer 1972, pl. 53, no. 1605 (not to scale).

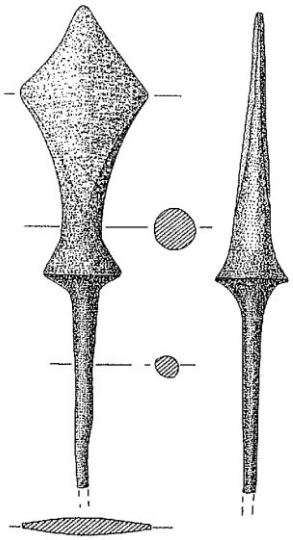

Figure 9.56: Undated Type 5e-20 from Norşuntepe; after Schmidt, K. 2002, pl. 49, no. 628 (not to scale).

The purpose of the wide stop would have been to allow the use of a thicker, and therefore heavier, arrow shaft. This added weight would tend to reduce the range of the arrow, but at the same time it would increase its impact energy, and thus its ability to penetrate its target. However, the wide stop certainly also served a decorative function, since it would have been just as easy for the smith or mold maker to include a stem of the same width as the desired stop rather than narrowing the stem and then widening it again at the stop.

9.12.2.29. 5e-57 – lenticular chisel w/concave shoulders and unstopped tang

Only one example of a Type 5e-57 is known from the sites surveyed here, Toprakkale 17, which dates to the mid 7th Century BC. However, a number of similar examples have been found at other sites.

One unpublished example, which appears to date to the Hellenistic period, was found at Khorsabad.[138] At Boğazköy, eight bronze examples were found.[139] Of these, only four could be dated, appearing in layers associated with Büyükkale IVb and III,[140] therefore approximately 1500 to 1200 BC (see Figure 9.57 and Figure 9.58).[141] Boğazköy also produced two iron examples, both of which appear to be rather crude imitations of the bronze form. One is of unknown date and has a relatively wide blade.[142] The other has a unique feature – the wide stop has a small hole of unknown function bored through it, parallel to the edge of the blade.[143] Given that this example dates to Büyükkale I, the late Phyrgian period,[144] it is reasonable to suppose that Type 5e-84s were being used at Boğazköy from the mid-2nd Millennium to the mid-1st Millennium BC.

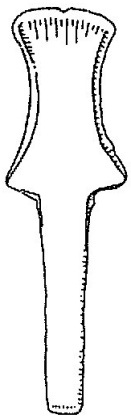

Figure 9.57: Bronze Type 5e-57 from Boğazköy, ca. 1500 to 1200 BC; after Boehmer 1972, pl. 41, no. 1199 (not to scale).

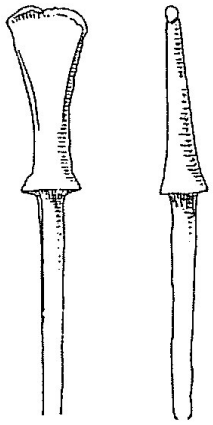

Figure 9.58: Bronze Type 5e-57 from Boğazköy, ca. 1500 to 1200 BC; after Boehmer 1972, pl. 41, no. 1201 (not to scale).

Stronach regarded such chisel-tipped points as the final stage in the development of wide-stopped arrowheads (see Type 5e-20 for a more detailed discussion), dating them firmly to the Hellenistic period.[145] While the dating of the Toprakkale example may not be entirely reliable (having been excavated in the 19th Century with little information about its context having been recorded), the dating of several examples from Boğazköy, firmly dated to the late 2nd Millennium BC, indicates that these chisel-tipped objects had been in use long before the Hellenistic period. Indeed, they appear to have been the origin of the wide stop, which was then presumably copied for use in arrowheads with more conventional points (see Types 5e-20 and 5y-3).

[138] Stronach 1996, p. 476; it is item IM-23626 at the Iraq Museum. Unfortunately, there do not appear to be any available photos or drawings of it.
[139] see Boehmer 1972, nos. 1199-1205A, p. 133
[140] Boehmer 1972, p. 133
[141] Genz 2004, p. 9
[142] Boehmer 1979, no. 3495, p. 36, pl. 23
[143] Boğazköy 1671; see Boehmer 1972, p. 159
[144] Genz 2004, p. 9
[145] Stronach 1996, 475-476

Stronach believed that the chisel-tipped arrowhead was characteristic of Commagene,[146] however many of the find sites (Boğazköy, Toprakkale and Khorsabad) are located well outside of Commagene. Nevertheless, Commagene does appear to lie roughly at the center of the distribution of chisel-tipped arrowheads. It is perhaps more likely, however, that they were developed in the Hittite Empire during the 2nd Millennium BC (considering the finds from Boğazköy), and continued to be used in that region as well as spreading to surrounding regions in the 1st Millennium BC.

It is worth noting, however, that the Boğazköy examples have significantly thicker blades than the Hellenistic examples illustrated by Stronach or the Toprakkale example. This could indicate either simple evolution of the form over time or it could also be that the early Boğazköy examples served a different function than the others, however the nature of that function is perplexing.

Boehmer described the Boğazköy objects as "*kleines miesselähnliches Werkzeuge*,"[147] and indeed, the gently curved blade would have been well-suited to a chisel's tasks. The wide stop would also be desirable, as the repeated heavy blows from the hammer would put the wooden or reed shaft under a great deal of pressure, making a secure flat surface for it to push against necessary to prevent it from cracking and slipping up over the blade. The tip of the Toprakkale example is chipped from an impact,[148] which could equally have resulted from employment as a chisel or as an arrowhead.

It is curious that a chisel would be made to take a shaft rather than solid metal along its full length. Solid metal chisels are well-attested in the early-1st Millennium. Toprakkale itself has produced a number of examples which have solid metal shafts.[149] A solid metal chisel would certainly be able to stand far greater impacts than one with a wooden shaft. If the Type 5e-57s were indeed chisels, then they were most likely intended for use in softer materials, so less force would need to be employed in hammering. The fact that all the examples are quite small suggests that if this were the case, they were intended for delicate detail work, for example, repoussé in sheet-bronze (such as the straight lines which often decorate bronze quivers). Nevertheless, there are ample solid metal chisels of similar size that would do the same job, and be far less prone to wear, whereas the shafts on these objects would wear out rapidly from the repeated hammering.

In conclusion, Type 5e-57 points could have served as chisels for light work, but were more likely a form of arrowhead which was employed from Anatolia to Transcaucasia. The find of such an object in a context clearly associated with production or with combat would help resolve this issue conclusively. Why such a flat cutting surface rather than a sharp point was desired in an arrowhead is

[146] Stronach 1996, p. 476
[147] Boehmer 1972, p. 132
[148] Wartke 1990, p. 128
[149] Wartke 1990, p. 110

unknown, however it must have been for use against "soft" targets, where even a point with fairly high resistance like this would be able to penetrate.

9.12.3. 5f through 5j – RHOMBOID SECTION ARROWHEADS

Arrowheads with rhomboid sections are relatively uncommon in the early 1st Millennium BC, with a mere 21 examples as compared to the 811 which have lenticular sections. It is worth noting, however, that while the vast majority of lenticular arrowheads are iron, the majority of rhomboid arrowheads (13 examples) are bronze. The reason for this has to do with their method of manufacture.

Forging a lenticular arrowhead is quite straightforward – slightly rolling it on the anvil as one hammers each side will easily produce a lenticular section. Great care would be required in the forging of rhomboid arrowheads, however. Rothenberg suggests that, in at least one case from Lachish (Lachish 67), such arrowheads were forged from a "squarish iron rod," and the ridge running up the middle of each side of a rhomboid blade was simply a remnant of the original shape of the stock.[150] While this is possible, it is rather unlikely since the blade of an arrowhead undergoes considerable deformation in being flattened, and the small size of an arrowhead ensures that the hammer blows of the smith will sometimes cross the center line of the arrowhead even if he focuses on the edges. A smooth central ridge must be deliberately created after the majority of the process of formation has been completed, otherwise it will be distorted by the movement of the metal.

Casting in bronze is a very different matter. Carving the curved faces of a lenticular arrowhead into a mold would have been more difficult and time consuming than the simple flat faces of a rhomboid arrowhead. Thus is it no surprise that only a small minority of the lenticular arrowheads are bronze, and some of those, such as Marlik 32 (Type 5a-4) and Nippur 1 (Type 5a-1), appear to have been forged rather than cast. The relative lack of rhomboid arrowheads, therefore, is a product of their manufacturing technique coupled with the tendency in the early 1st Millennium BC to make leaf-shaped arrowheads out of iron rather than bronze.

The function of the rhomboid section was most likely primarily decorative, perhaps to imitate forms of arrowheads that may have been more common in the 2nd Millennium BC.[151] The thickness of a blade is what provides it with longitudinal strength, and so a rhomboid blade would weigh slightly less than a lenticular blade of equal thickness (since the curving faces of the lenticular blade require it

[150] Rothenberg 1975, p. 74
[151] e.g., at Tell Munbaqa; see Czichon & Werner 1998, pl. 117:1401-1405

to have a greater volume), however the difference would be so minimal that it would likely have no practical effect.

9.12.3.1. 5f-1 – rhomboid leaf w/rounded shoulders & unstopped tang

Type 5f-1 is the simplest form of arrowhead with a rhomboid section as well as the most numerous, with nine examples. They are well-attested in Transcaucasia and Iran, with a single additional example coming from Carchemish. They must have been in use throughout most or all of the early 1st Millennium, as those from Marlik are dated to before 850 BC (and as early as 1450 BC) and that from Hasanlu to the 8th Century BC, while those from Toprakkale and Carchemish date to the latter part of the 7th Century BC or even the early 6th.

Their blade lengths cover an even range from 3.5 to 6.8 cm, falling well within the range of sizes attested for Type 5a-1s. They all have reasonably consistent profiles, though several (Hasanlu 13, Marlik 37, Bastam 11, Marlik 35 and Carchemish 39) are particularly narrow. Indeed, Marlik 35 could almost qualify as a long blade rather than a normal leaf-shaped one.

Toprakkale 14 is unusual, partly for the fact that it is made of iron rather than the more usual bronze, but more so for its unusual section and profile. It is unusually thick relative to the width of its blade, to the point that it could almost be a somewhat flattened square bodkin (though it still retains the rounded shoulders so characteristic of most leaf-shaped arrowheads). Naturally, this would have meant that Toprakkale 14 would possess some of the features of bodkins, namely that it would be well-suited to pierce armor, since it would put its impact energy into the smallest point possible, while at the same time producing a correspondingly small wound.

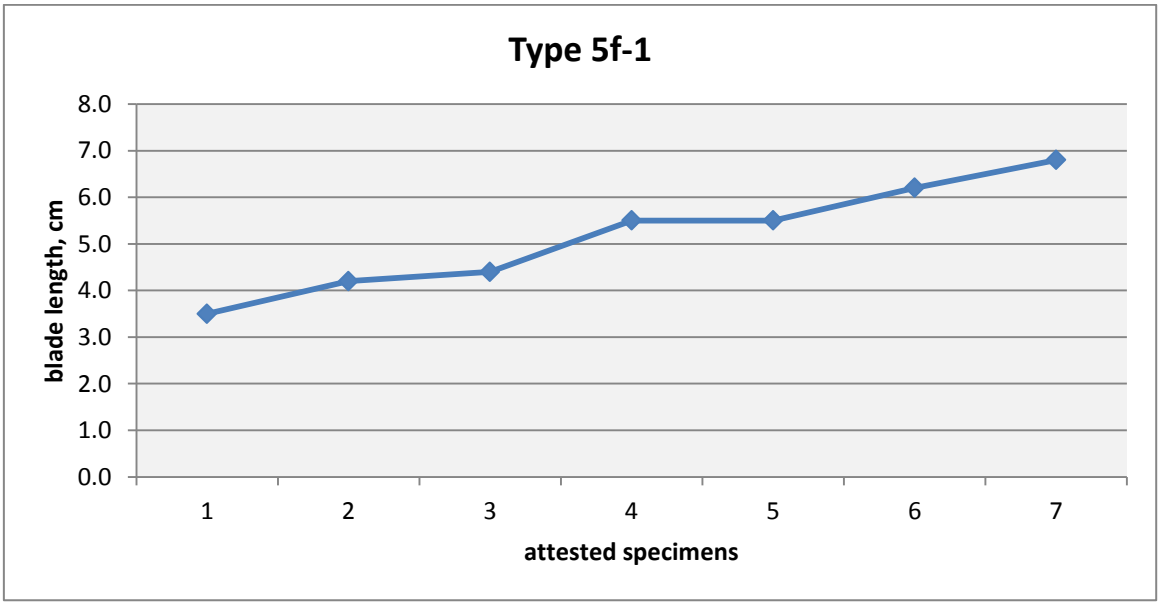

Figure 9.59: Sizes of Type 5f-1 arrowheads.

9.12.3.2. 5f-5 – rhomboid leaf w/barbed shoulders and unstopped tang

The sole 5f-5 from the surveyed sites is the rather poorly preserved Marlik 29. It dates from the latter half of the 2nd Millennium BC to the very beginning of the 1st, and so was likely manufactured before the period covered by this work, which is also suggested by the fact that it is bronze rather that iron. The barbs are small and not well-defined (though this could be partly the result of corrosion). It is imposible to say if it was cast or forged, though the distinct step formed where the thinner tang joins the thicker arrowheads right between the barbs favors casting, since forging those small features close together would likely have been somewhat challenging.

9.12.3.3. 5g-1 – rhomboid leaf w/rounded shoulders & stopped tang

Nearly as numerous as Type 5f-1, the stopped Type 5g-1 has six examples. From the older Marlik 22 to the younger Toprakkale examples, Type 5g-1 arrowheads appear to have been used through the whole of the early 1st Millennium BC. Type 5g-1 blades range from 3.0 to 6.5 cm, however Toprakkale 10 is unusually small, as the rest fall into the much narrower range of 5.0 to 6.5 cm.

In all but one case, the stem is an element distinctly separate from the blade. They are more-or-less round, as are the tangs. Marlik 22, however, exhibits a stem with a square section. In fact, this stem appears to be an extension of the blade, since the medial ridges of the rhomboid blade continue down its full length, forming two of its four edges. The square tang, however, appears to be rotated 45º to the stop and the blade, so that it appears flat in profile. The reason for this design choice is obscure, but it is noteworthy that Marlik 22 may be the oldest arrowhead of the group, as it is dated to 1550 to 750 BC. It could therefore represent a design that was more common in the late 2nd Millennium BC[152] but which had been replaced with round stems in the 1st Millennium, as evidenced by the other Type 5g-1s. This round stem may have been added to make the arrowheads more closely resemble the much more common (and typically iron) Type 5b-1 arrowheads.

[152] It is common among the el-Khadr projectile points; see Cross & Milik 1957, fig. 2.

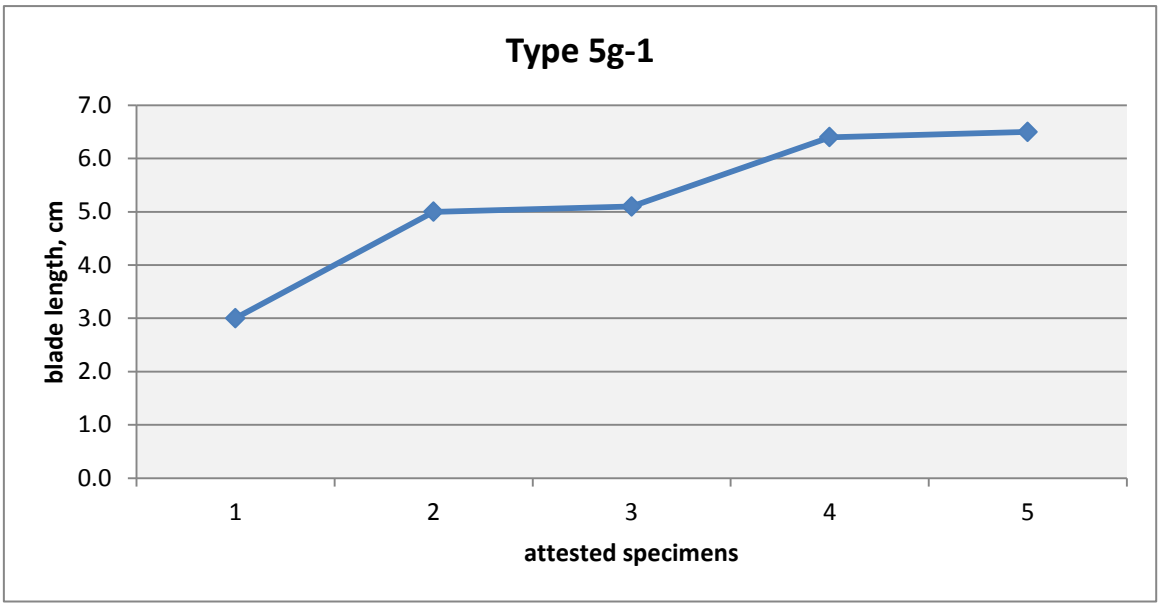

Figure 9.60: Sizes of Type 5g-1 arrowheads.

9.12.3.4. 5g-4 – rhomboid leaf w/squared shoulders & stopped tang

All five Type 5g-4 examples from the sites surveyed come, in fact, from Marlik. What is more, all of them are dated to the latter half of the 2nd Millennium BC or the very beginning of the 1st, therefore there is a high probability that they were manufactured before the period covered by this work.

Type 5g-4s vary enormously in size, from 2.6 to 9.8 cm long blades. The three smallest examples have comparable blade sizes, from 2.6 to 2.9 cm, but Marlik 21 is substantially larger, and Marlik 24 is extremely large compared to the rest. While some of the long-bladed arrowheads come close to Marlik 24 in overall length, it is clear that Marlik 24 was a substantially heavier blade. So heavy, in fact, that it almost certainly was employed as a different form of weapon, such as a javelin. However, Marlik 24's profile very closely matches that of Marlik 21, which is of a very reasonable size for an arrowhead. This illustrates the danger of attempting to posit a typological difference between arrowheads and the points of javelins or other thrown weapons.

Marlik 15 is also noteworthy due to the shape of its blade. Judging by the drawing, the arrowhead appears to have originally been cast (or perhaps forged) as a cone atop a tang (essentially a Type 1a-2), and then the blade was formed by hammering each side of the cone, which flattened it and forced the metal out, forming the blade. However, a trace of the original cone was left between the two sides, forming the medial ridge. If this is indeed the case, Marlik 15 could have been a Type 1c-1 bodkin which was later modified into a Type 5g-4, or it could indicate that this was the chosen manufacturing method for this arrowhead. Normally, arrowheads would be cast into essentially their

final form, with minimal modifications done afterwards. However, casting a rough blank which requires extensive modification is not unknown.[153]

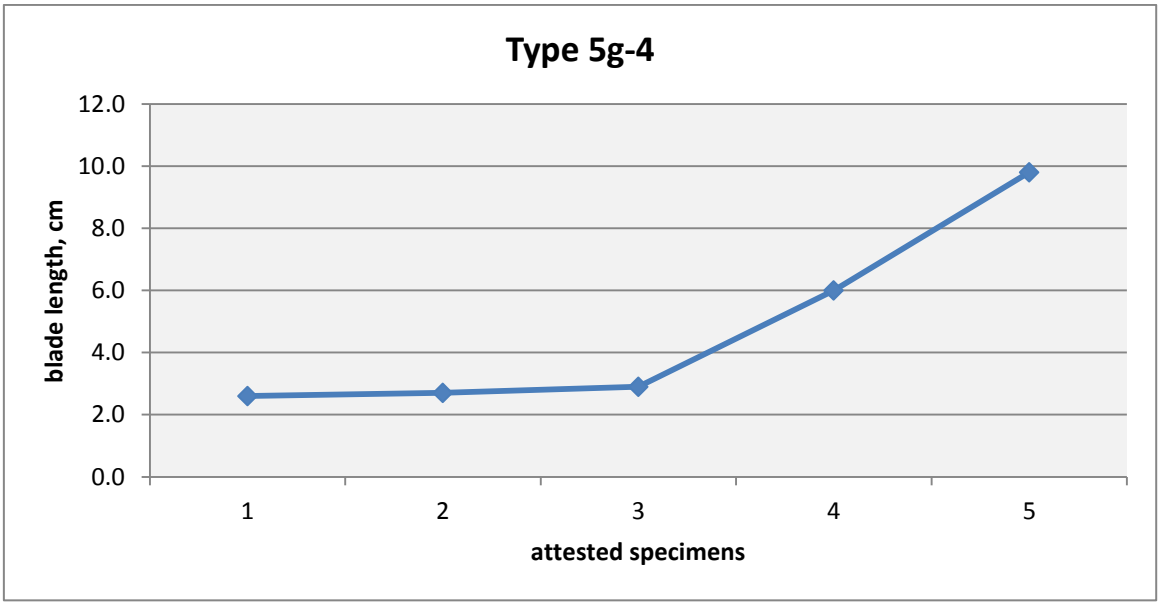

Figure 9.61: Sizes of Type 5g-4 arrowheads.

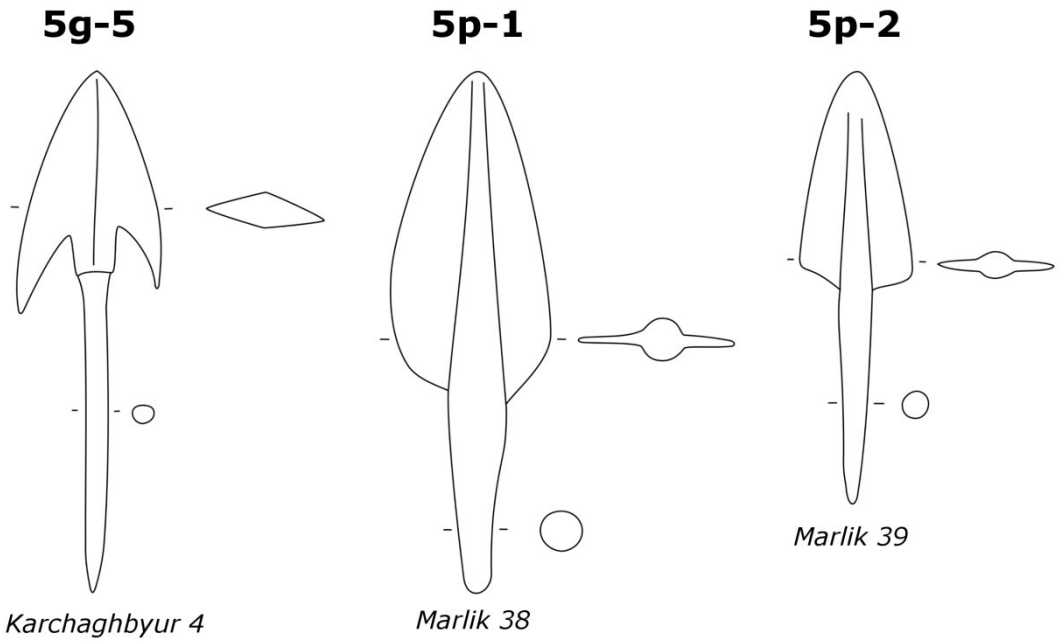

Figure 9.62: Types 5g-5 to 5p-2.

9.12.3.5. 5g-5 - rhomboid leaf w/barbed shoulders & stopped tang

Karchaghbyur 4, the sole example of a Type 5g-5 from the sites surveyed, is a small bronze arrowhead with a blade of 3.5 cm mounted on a longer tang dating to the 8th to 7th Century BC. The

[153] see Luciani 2004, 160-161 & fig. 130

barbs are quite pronounced, to the point that the arrowhead distinctly resembles the swallowtail arrowheads also found at Karchaghbyur (see Types 5p-7 and 5p-8).

9.12.4. 5k through 5o – FLATTENED RHOMBOID ARROWHEADS

It should be noted that while flattened rhomboid arrowheads (Types 5k through 5o) are theoretical possibilities since flattened rhomboid sections are attested in the 2nd Millennium BC,[154] none are attested from the easly 1st Millennium BC among the sites surveyed. Several examples from Sialk (Types 5u-1 and 5u-21) may conceivably be flattened rhomboids, however the lack of section drawings makes it impossible to be sure. Since flattened ribbed sections seemed more likely, I have assigned them to that type instead.

Flattened rhomboid arrowheads are a simple variation on rhomboids. The ridges on both faces of the blade formed on a rhomboid arrowhead are simply flattened to create two additional planes to the arrowhead's surface. This may have aided penetration by reducing the cross-section of the arrowhead, and it may have lightened it to help extend the range, however the amount of material removed is so slight that any advantage must have been negligible.

9.12.5. 5p through 5t – RIBBED ARROWHEADS

Cross and Milik hypothesized that ribs on arrowheads were an attempt to mimic ribbed spear points,[155] however it is much more likely that the rib on arrowheads served the same structural function as they did on spear heads: to provide the blade with greater longitudinal strength. Cast bronze arrowheads in particular could often be very thin, which had the beneficial effect of reducing resistance on penetration, allowing the arrowhead to cut into the target more efficiently, as well as reducing weight thus allowing greater range. However, a thin blade will also be far more prone to bending or breaking on impact. A raised rib added along the centerline on each face of the arrowhead provided the arrowhead with, in effect, a spine, vastly increasing its rigidity while not substantially adding to its weight or cross section.

Ribs are significantly more common on bronze arrowheads than iron arrowheads. Of the 97 ribbed arrowheads from the sites surveyed, 57 are bronze or copper and 31 are iron (the remaining nine are of unknown material). This is likely a result of the manufacturing techniques employed for bronze and for iron. Ribs could easily be carved into molds for bronze arrowheads. Forging a rib into an iron arrowhead would require considerable extra labor (compared to lenticular arrowheads) for each

[154] e.g. Boehmer 1972, pl. 26: 817-819, 822-824; pl. 27: 829-837; & pl. 28: 838, 841-846, 849-853
[155] Cross & Milik 1956, p. 18

individual arrowhead made since the rib would have to either be raised up from the arrowhead, or perhaps carefully left in place when the rest of the blade was flattened out from the original rod of iron. It would also have to be correctly centered, straight and even, where a lenticular arrowhead requires much less precision on the part of the smith.

In addition, iron arrowheads often had more robust sections than bronze examples,[156] and therefore the addition of a rib was not necessary since they already would have possessed considerable longitudinal strength. Thus, the ribs on iron arrowheads probably served a primarily aesthetic function, as it would make them resemble cast bronze arrowheads. However, it is also conceivable that they were intended for particularly tough targets, where the blade would need the extra support provided by the rib, yet more cutting of the target was desired than would be obtained with a bodkin point.

9.12.5.1. 5p-1 - ribbed leaf w/round shoulders & unstopped tang

Type 5p-1 is a simple leaf-shaped arrowhead, augmented by a rib running the length of the blade. Of the 19 extant examples (the majority of which are bronze), 13 are certain and have intact blades which cover a very large range of 4.0 to 11.8 cm (with that of Carchemish 24, a possible 5p-1, a mere 2.2 cm). The sizes appear to fall into two distinct groups, from 4.0 to 4.9 cm and 7.3 to 8.9 cm. The unusual Marlik 36 falls in between both groups at 5.9 cm, and there are an additional two examples which are respectively much smaller and much larger than the rest. Indeed, the largest, Sialk 9, is almost certainly too large to have served as an arrowhead. It was much more likely a javelin point, or perhaps even a small spear point.

Despite the two evident size groupings, the profiles of the arrowheads vary greatly, some with longer, narrower blades (Gerar 2, Hasanlu 55, Gerar 4 and Sialk 75) and some much wider relative to their length (Sialk 78 and Marlik 38). Furthermore, in some examples, the midrib is clearly an extension of the tang (Marlik 38, Sialk 78, Sialk 75, Sialk 50, and Sialk 9) while in at least the case of Marlik 34 and Marlik 36, the tang is clearly a separate element from the midrib. Therefore, the size groupings may have represented common standard weights for arrowheads, however they were not stylistic groupings. Unfortunately, the only weight available is for the anomalously small Carchemish 24 (2.0 grams).

Gerar 4 is worthy of note in that it is inscribed with a lozenge or rhombus shape on the rib. Petrie identified Gerar 4 as an Assyrian lance head due to the appearance of that symbol on cylinder seals.[157]

[156] For example, Lachish 25 (Type 5q-1) and Nippur 2 (Type 5p-1) have remarkably thick sections compared to the bronze examples.
[157] Petrie 1928, p. 13

With a blade of only 4.9 cm, Gerar 4 is certainly far too small to be any kind of lance or spear. Furthermore, its attribution to the Assyrians is questionable, as if it were indeed a mark of Assyrian manufacture, one would expect to find it more commonly on Assyrian artifacts.

Marlik 36 is an unusual arrowhead due to two characteristics. First, the blades are somewhat concave rather than being convex as normal. However, this may have been due to the excessive removal of material when sharpening the blade after casting, or perhaps the blade was badly chipped, so both sides were filed back in order to re-use the arrowhead. The rather sharp angle where the convex curve of the blade running down from the tip abruptly changes to convex further suggests that this blade form was a modification done to the blade after casting. The second unusual characteristic is that the drawing makes it appear that the rib ends quite distinctly well below the actual tip of the blade. It could be that the tip was thicker than the main body of the blade, and so the narrowing midrib merged into it, a characteristic exhibited in the 2nd Millennium BC arrowheads from el-Khadr.[158] However, the drawing seems to suggest that unlike other midribs that taper gently all the way to the tip, the midrib of Marlik 36 hardly tapers at all and is simply cut off before the tip. Sectional drawings or a side profile would clarify this issue enormously. In any event, except for the oddly concave blade and anomalous upper end of the midrib, Marlik 36 clearly strongly resembles Marlik 34, especially in the distinct lower end of the midrib and the smaller, square tang, and the two are doubtless related.

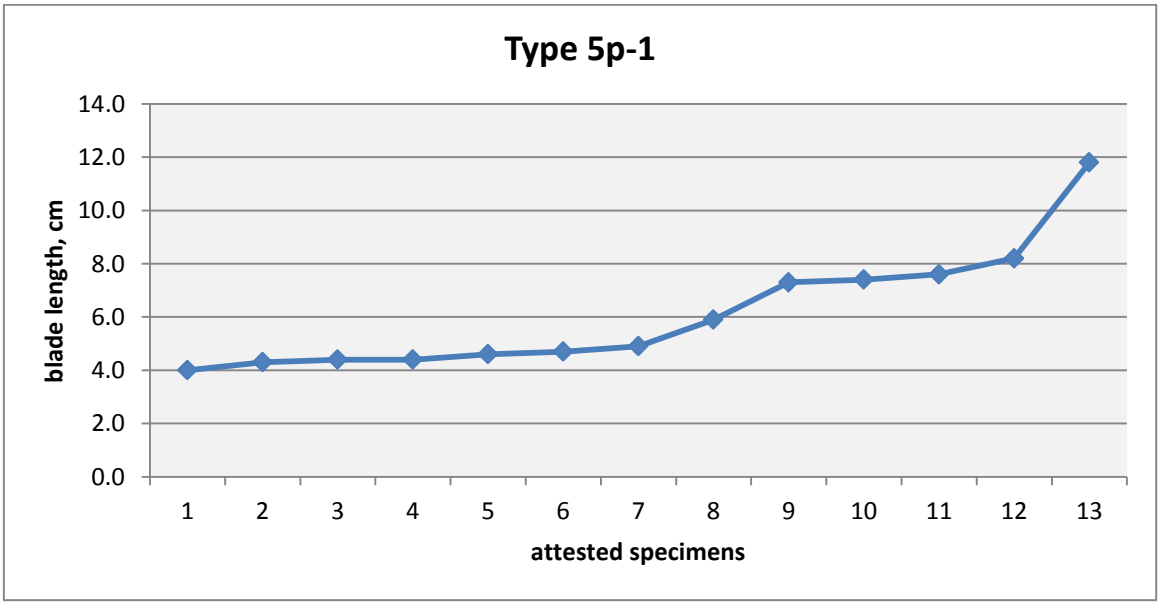

Figure 9.63: Sizes of Type 5p-1 arrowheads.

Type 5p-1 appears to have been used over much of the Near East, as it is attested in all regions except Transcaucasia and Northern Iraq. This form of arrowhead appears to have been common in the late

[158] see Cross & Milik 1956, p. 20, fig. 2

2nd Millennium BC: the Marlik examples may be as early as 1450 BC, and comparable examples have been found in other 2nd Millennium BC contexts at sites such as Alalakh,[159] Kar-Tukulti-Ninurta,[160] Beycesultan,[161] Tell Brak,[162] and Megiddo.[163] The 7th Century BC example from Carchemish shows that this venerable form continued to be used for much of the early 1st Millennium BC.

9.12.5.2. 5p-2 - ribbed leaf w/angled shoulders & unstopped tang

The three Type 5p-2s, all bronze, come from widely-separated sites in Iran, Southern Iraq, and Syria. The smallest example, Marlik 39, has a fairly short blade (3.3 cm) in relation to its length, and therefore rather large angled shoulders. The two larger examples resemble each other despite coming from two different regions. They are comparable in length (blades of 7.7 and 8.9 cm) and both exhibit long, gently curved blades with small angled shoulders (Fakhariya 14 being the most pronounced example). If Uruk 22 does indeed date to the Neo-Babylonian Period, Type 5p-2 arrowheads were in use for the whole of the early 1st Millennium BC.

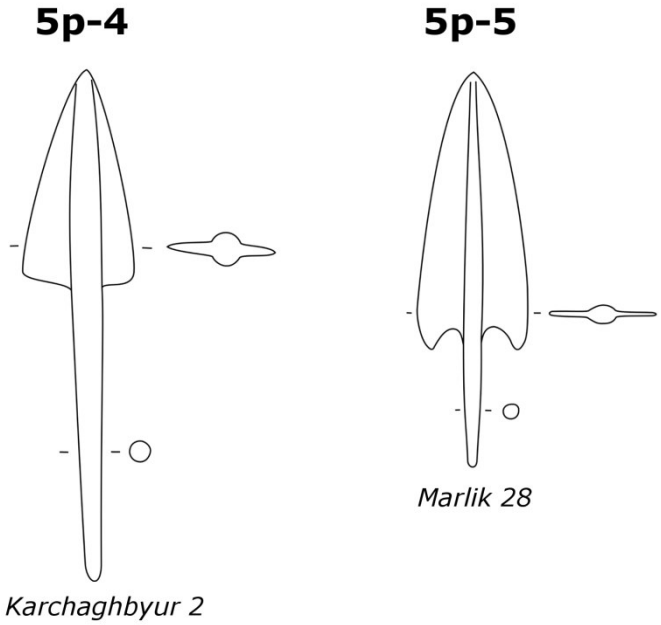

Figure 9.64: Types 5p-4 to 5p-5.

9.12.5.3. 5p-4 - ribbed leaf w/squared shoulders & unstopped tang

Type 5p-4 is composed of two distinct sub-types. With a blade of 3.2 cm, Karchaghbyur 2 is smaller than the Gerar examples, has a nearly deltoid blade with wide squared shoulders and is made of

[159] Woolley 1955, pl. 71:Ar.10
[160] Eickhoff 1985, pl. 14.15:15 (T 339)
[161] Mellaart & Murray 1995, p. 157, fig. O.7: 100 & 102; p. 161, fig. O.11: 142
[162] Oates, Oates & McDonald 1997, p. 265, fig. 232:1, 3-7, 10, 15, 22
[163] Harrison 2004, pl. 34:3-5

bronze. The two Gerar examples are very similar to each other, both made of iron and of comparable sized (blades of 5.4 and 6.1 cm). Their widest point is near their tip, resulting in something like a cross between a pentagonal and a long blade. The resulting shoulders are very small. While dating of the Gerar examples is uncertain, the fact that they are iron means that they are not likely to be earlier than the early 1st Millennium BC.

9.12.5.4. 5p-5 - ribbed leaf w/barbed shoulders & unstopped tang

The three 5p-5s with known measurements have blades of between 4.4 and 6.7 cm. Karchaghbyur 8 has relatively long and sharply pointed barbs (it is worth remembering that it was found with a number of swallowtail arrowheads, see types 5p-7 and 5p-8), and also retains the "remains of devices" (presumably metal rings) that had fastened the arrow shaft to the tang, giving it the appearance of being stopped.[164] Hasanlu 54 has a fairly long blade and pronounced barbs that project somewhat outward, reminiscent of Type 5p-8 swallowtails. Marlik 28 is smaller, with a blade of only 4.4 cm and comparatively minimal barbs. The two Carchemish examples are nearly identical to each other, with small but pronounced barbs and gently curved blades. Unfortunately, their dimensions are not known. Both Marlik examples were found in burials, while the Hasanlu and Carchemish examples come from destruction levels, suggesting that this type was both certainly employed for warfare, yet also considered of adequate value to serve as burial goods.

Type 5p-5s were clearly used throughout much of the early 1st Millennium BC, with Marlik 28 at the beginning of the period (or even earlier) and those from Carchemish close to its end. Bronze is the preferred material for the earlier examples, however the 8th Century BC Hasanlu 54 shows that even at that date, iron was being employed to manufacture this type of arrowhead in Iran. Not attested in the Levant, Southern or Northern Iraq, they appear to have been primarily used in an arc running from Iran through Transcaucasia and down to Syria.

[164] Yengibaryan 2002, p. 423

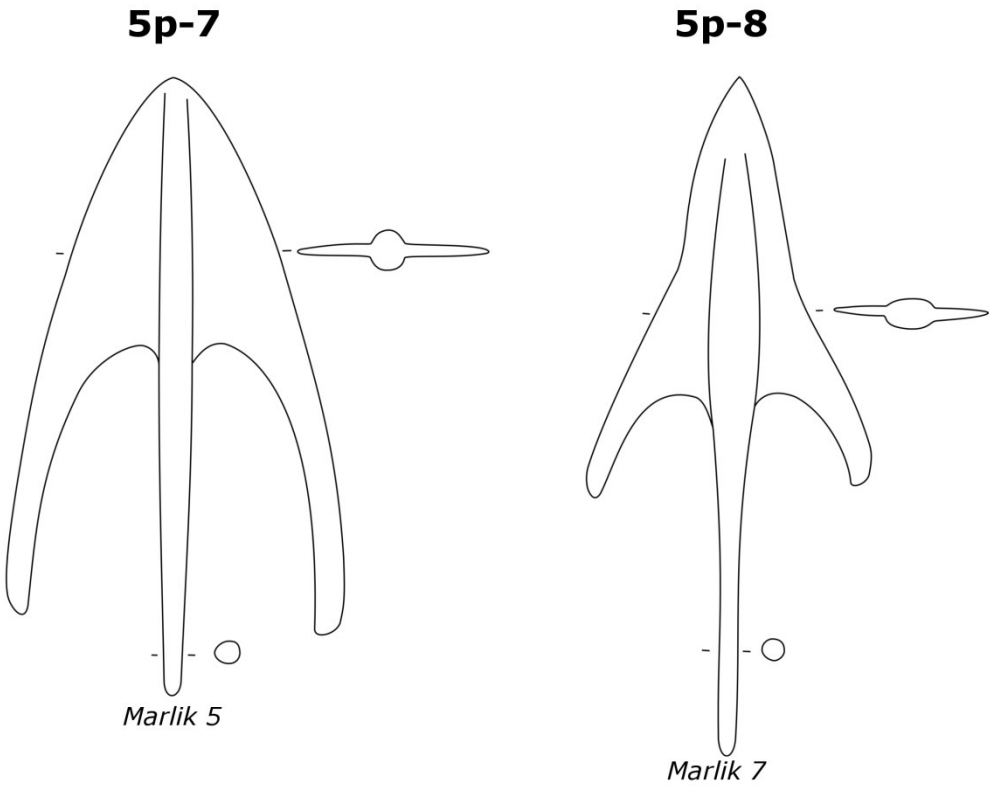

Figure 9.65: Types 5p-7 to 5p-8.

9.12.5.5. 5p-7 - ribbed convex swallowtail w/unstopped tang

There are only two examples of Type 5p-7, however they come from two different regions. While both have similar overall lengths, the blade of Marlik 5 is significantly longer, extended considerably by the tails of its remarkably extended swallowtail blade. They appear to have been used over a very considerable time span, as Marlik 5 could be as old as 1550 BC and Karchaghbyur could be as recent as the 7th Century BC. Both examples were found in tombs, which suggests that arrowheads such as these may have had some status associated with them, which may be further supported by the fact that the most likely use of swallowtail arrowheads was hunting, an activity often associated with higher status in the ancient Near East (see §4.1).

9.12.5.6. 5p-8 - ribbed swallowtail w/unstopped tang

With five examples, Type 5p-8 is the most common form of swallowtail arrowhead attested among the sites surveyed. As with Type 5p-7, Type 5p-8 swallowtails are attested only at Marlik and Karchaghbyur,[165] and therefore all examples come from burials. There appear to be two basic sizes. The three largest arrowheads with known blade lengths – Karchaghbyur 7, Marlik 7 and Marlik 6 – are quite similar in both their profile and their size (4.3 to 6.0 cm). The upper blade of Karchaghbyur

[165] Dyson notes a similar object, which he considers a javelin head, from Bît-Sorgh in Iran, dating to ca. 1000 BC; see Dyson 1964, p. 32 & fig. 1: 6

7 is not so elongated as the Marlik examples, but its tails are longer. Karchaghbyur 1 is significantly smaller, and the blade has only a hint of the double convexity characteristic of a standard swallowtail. Karchaghbyur 6 appears to be of roughly the same size, however the tails are broken off of the blade, so their original length can only be guessed at. As with Type 5p-7, the regular ribbed swallowtails may have been used over a very considerable span of time, from the middle of 2nd Millennium BC to as late as the end of the 7th Century BC. Their find sites in Iran and Transcaucasia also suggest a fairly wide area of use.

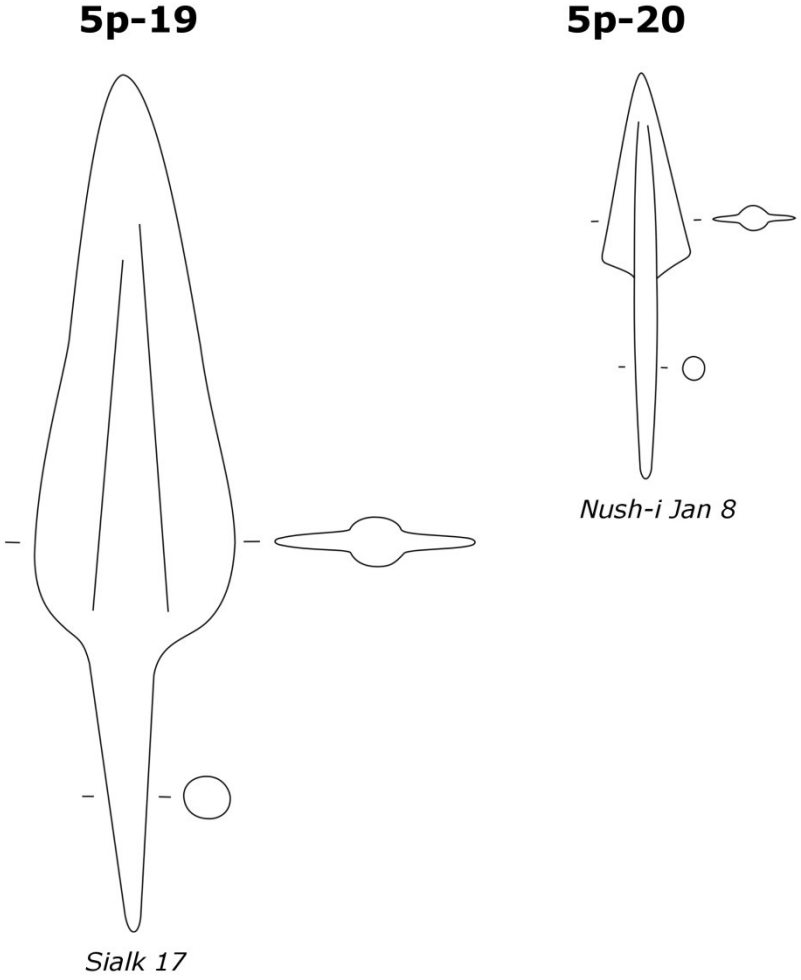

Figure 9.66: Types 5p-19 to 5p-20.

9.12.5.1. 5p-19 – ribbed triangular w/round shoulders & unstopped tang

Two possible examples of Type 5p-19 arrowheads come from Sialk (their section is uncertain due to the lack of section drawings and unclear profile drawings). Both are bronze and date to the 9th to 7th Century BC. They are of comparable sizes, with blades of 7.8 and 8.9 cm. While their shoulders appear somewhat rounded, this could simply be natural variation from the more numerous Type 5p-20s found at Sialk.

9.12.5.2. 5p-20 – ribbed triangular w/angled shoulders & unstopped tang

The majority of the seven 5p-20s are uncertain examples from Sialk (their ribs are not certain because they did not have section drawings, though it is fairly clear on Sialk 41). These are fairly large, with blades from 8.0 to 12.7 cm long, and those whose material is known are made of bronze. The sole certain 5p-20 is the tiny Nush-i Jan 8, with a mere 2.7 cm blade. Due to the poor quality of the Sialk drawings, it is difficult to make comparisons, however Nush-i Jan 8 appears to have been rather more carefully made, with a very even blade with well-defined shoulders. Its tang is broken close to the blade, so there is a possibility that the tang was originally stopped, though this is unlikely considering the small size of the blade. It is somewhat later than the Sialk examples, dating to the end of the early 1st Millennium BC

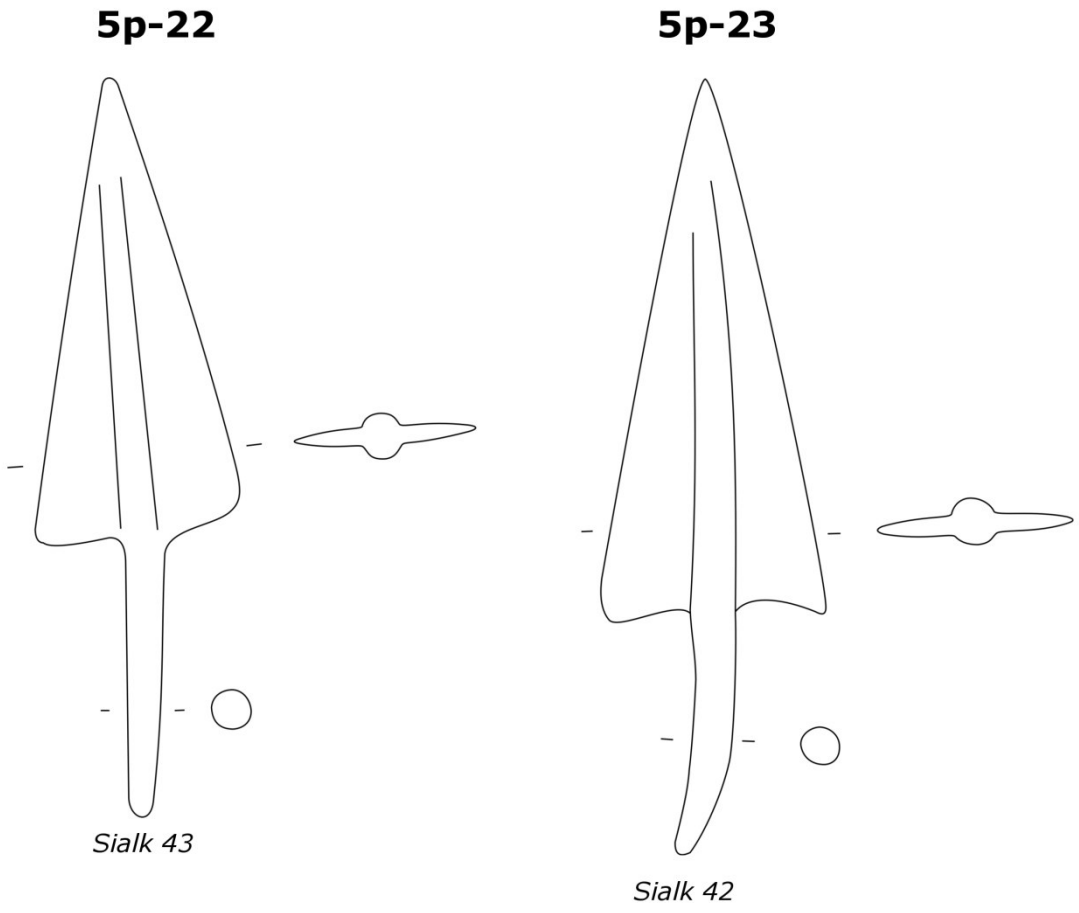

Figure 9.67: Types 5p-22 to 5p-23.

9.12.5.1. 5p-22 – ribbed triangular w/squared shoulders & unstopped tang

The sole example of Type 5p-22 is Sialk 43. Its material is not known and its shoulders (as depicted in the drawing) are not very even. The left is clearly squared or even very slightly barbed, while the right could be a corroded squared shoulder or even a slightly angled shoulder. It may represent natural variation of the more common Type 5p-20s from Sialk.

9.12.5.2. 5p-23 – ribbed triangular w/barbed shoulders & unstopped tang

Type 5p-23 is also represented by a single example of unknown material from Sialk. The shoulders are only very slightly barbed, so this may have been natural variation of squared shoulders such as Sialk 43.

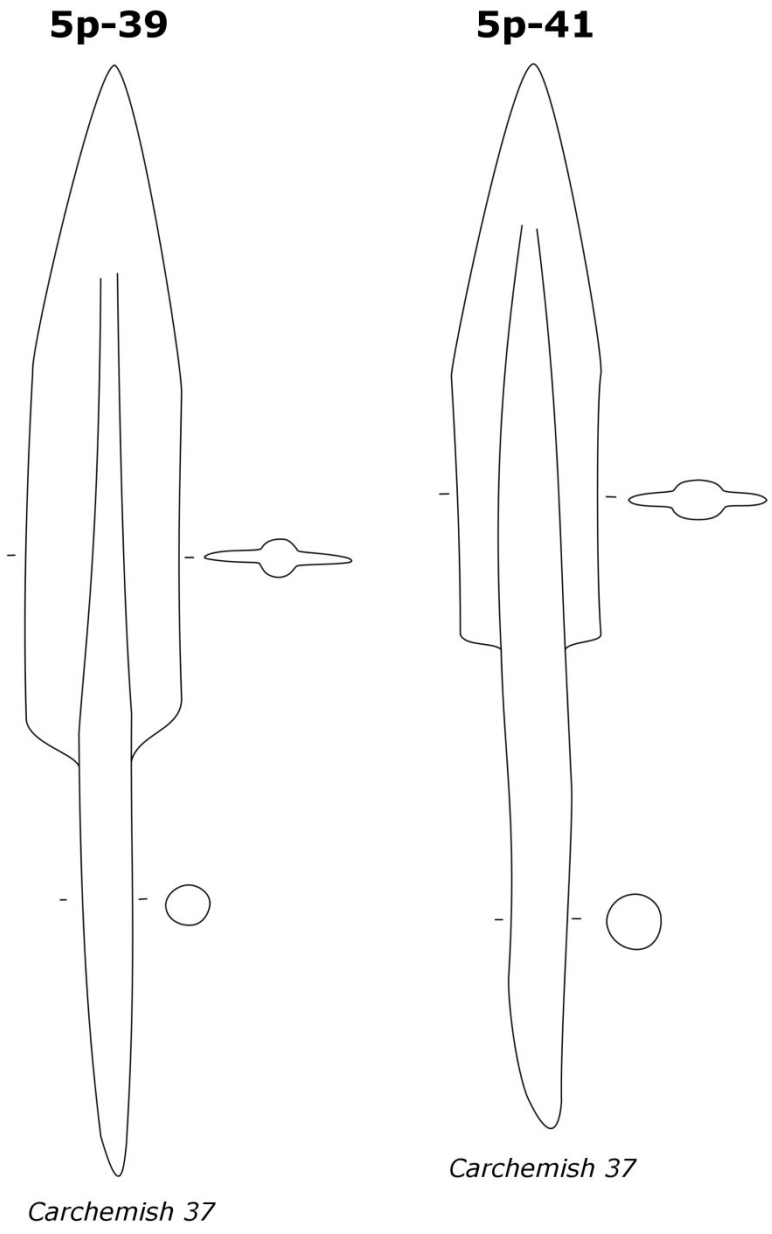

Figure 9.68: Types 5p-39 and 5p-41.

9.12.5.3. 5p-39 – ribbed pentagonal w/angled shoulders & unstopped tang

Both 5p-39s come from Carchemish, are made of iron and date to the late 7th Century to early 6th Century. Unfortunately, no measurements are available for Carchemish 41, but Carchemish 37 has a

very long 9.3 cm blade. If Carchemish 41 is roughly the same size, it is perhaps more likely that both of them were javelin heads rather than arrowheads. While not as large as Sialk 9 (Type 5p-1, 11.8 cm blade) or Sialk 49 (Type 5p-20, 12.7 cm blade), Carchemish 37 is still on the large side for an arrowhead. The thick tangs also suggest that the points were attached to relatively thick shafts, which also suggests their use as javelins.

The lower halves of the blades in both examples are somewhat concave (markedly so in the case of Carchemish 41). This concavity of the lower blade appears to be simply a matter of natural variation, a great deal of which is to be expected when items are forged individually from iron. The obviously closely related Type 5p-41s exhibit little or no concavity.

9.12.5.4. 5p-41 – ribbed pentagonal w/squared shoulders & unstopped tang

Very similar to Type 5p-39 (also exclusively attested at Carchemish), both Carchemish 35 and 31 are made of iron and have unusually long blades, 7.7 and 8.4 cm respectively. Furthermore, like the Type 5p-39 examples, their large size and thick tangs suggest that they were more probably used as javelin head rather than arrowheads.

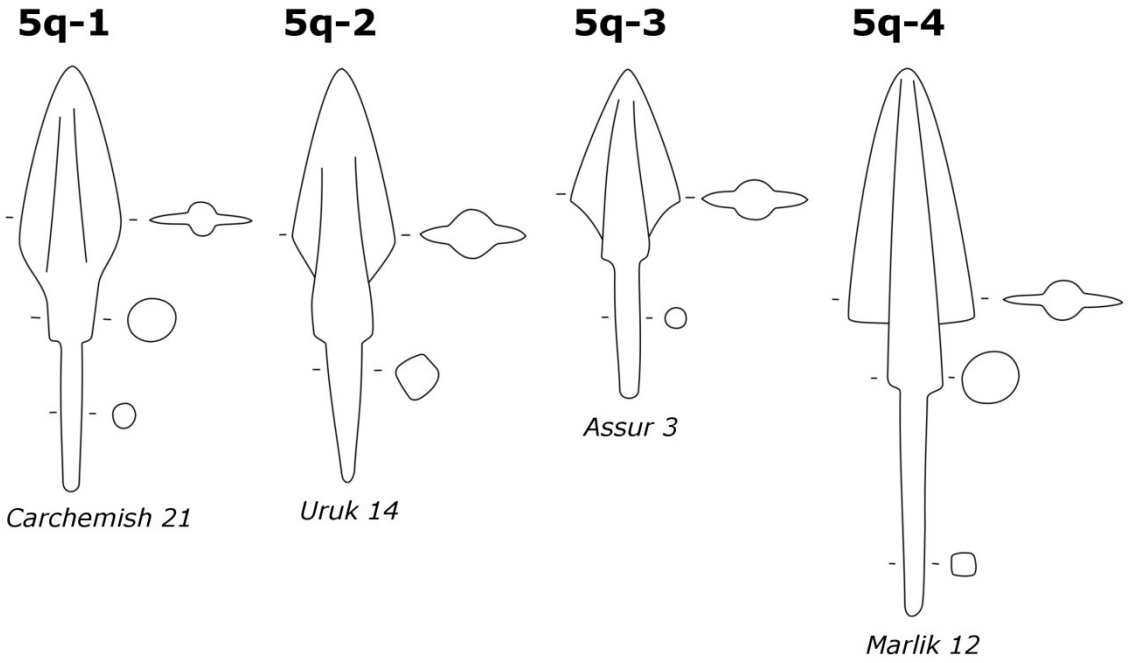

Figure 9.69 Types 5q-1 to 5q-4.

9.12.5.5. 5q-1 – ribbed leaf w/round shoulders & stopped tang

Type 5q-1 is represented by 16 examples, almost as many as the unstopped Type 5p-1 (19 examples). Thirteen have intact blades and fall into two distinct groups: seven examples have 2.7-4.7 cm blades and the larger six have 5.9 to 7.3 cm blades. Examples from Lachish and Carchemish belong to both

groups, so this is not the result of regional trends. The weights (as preserved) of the arrowheads vary considerably (from 6.0 to 16.7 grams), and not in direct proportion to their blade lengths. For example, Lachish 119 and 365 have small 4.4 cm blades, yet are heavier than many of the larger examples.

The small Carchemish 21 and 29 and very similar to each other, with short blades and stout tangs. However the larger Carchemish 33, while from the same site, is nothing like them. It has a very long blade incorporating almost the entire stem, and a small, short tang (relative to the size of the blade). Indeed, its relatively large length and width suggest that it may have belonged to a javelin rather than an arrow. Likewise, the two Hasanlu examples are very heterogenous, with the small Hasanlu 34 rather resembling Carchemish 21 and 29 save for having a more pronounced stem, while the poorly preserved Hasanlu 22 resembles the Lachish examples more closely. The two Nimrud examples are nearly identical with each other with very narrow blades, but the remaining large example, Gerar 67, is far wider blade with its widest part closer to the tip than the tang.

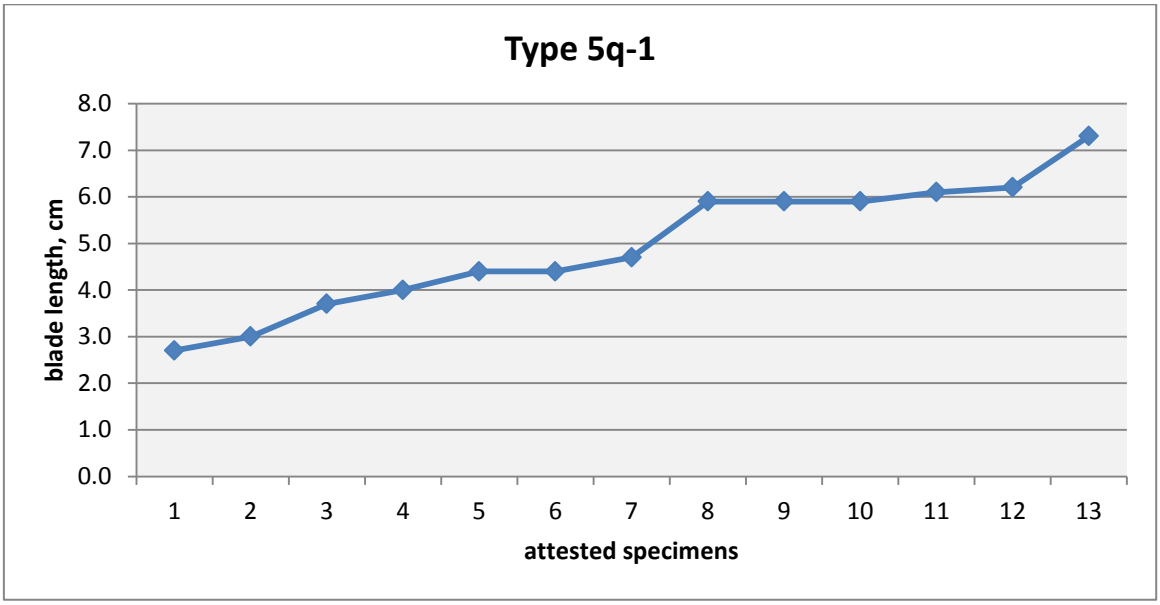

Figure 9.70: Sizes of Type 5q-1 arrowheads.

The Lachish examples represent still another style, most of them (particularly Lachish 25, 81, 119 and 120) possessing large, well-defined stems not unlike those of the Nimrud examples, but generally wider. Thus, while the Type 5q-1 arrowheads all share similar features, there is clearly no close relationship between them except among those found at the same sites as each other.

All attested examples (with one exception) are iron, and most appear to date to the 8th Century BC or later. The exception is Lachish 81, which is made of copper and dates to the 9th Century BC. This is

in contrast to the unstopped Type 5p-1s, over half of which are bronze, and some of which clearly date to the very beginning of the 1st Millennium BC, or even earlier (and thus an early date for the copper Lachish 81 is no surprise). This suggests that over the early 1st Millennium BC, even ribbed arrowheads started to be made more often in iron, and furthermore that stops began to be more regularly used (perhaps due to the success of the largely iron Type 5b-1s). Type 5q-1s are attested only in Iran, Northern Iraq, Syria and the Levant. The low number of Iranian examples is striking, since many other forms of ribbed arrowheads with stops are well-attested at sites in Iran (see Types 5q-4 and 5q-5).

9.12.5.6. 5q-2 – ribbed leaf w/angled shoulders & stopped tang

Uruk 14 is a small bronze arrowhead (2.9 cm blade) with a wide stem which extends upwards, becoming the midrib. This gives it an unmistakable resemblance with long-socketed bilobate arrowheads (Type 2-2). Indeed, it may well have been the intent of the mold-maker to produce an arrowhead that resembled a socketed bilobate but which could nevertheless be made with a relatively simple two-piece mold (see Type 4 for a similar case). Since the socket has been replaced with a tang, there would be no need for the third piece of such a mold, the plug which forms the cavity inside the socket. Thus, Uruk 14 represents a "poor man's bilobate."

Unfortunately, the dating of Uruk 14 is open to question. It was discovered in the economic archive of the Eanna, which operated in the Neo-Babylonian Period but was also re-used in the Achaemenid Period.[166] It is not unlike 2 examples from Persepolis,[167] both of which have a long rib that extends into a stem with a stop. The rib and stem seem proportionally thinner than the Uruk example, but the similarity is close enough that it suggests that the Uruk example may also be Achaemenid in date.

9.12.5.7. 5q-3 – ribbed leaf w/concave shoulders & stopped tang

Assur 3, a small (2.1 cm blade), badly corroded arrowhead is the sole representative of Type 5q-2 among the sites surveyed. Unlike most of the finds from Assur, Assur 3 was found in a burial which has been dated to the Neo-Assyrian Period.[168] Its small size suggests that it was intended for long-range shooting.

9.12.5.8. 5q-4 – ribbed leaf w/squared shoulders & stopped tang

All five attested 5q-4s come from Iran (four from Marlik and one from Hasanlu), and their blades range in size from 3.4 to 6.8 cm, very similar to the sizes of the unstopped 5p-4s (3.2 to 6.1 cm). All of them have very comparable profiles: all have a midrib that widens gently, becoming a fairly wide

[166] Van Ess & Pedde 1992, p. 37
[167] Schmidt, E.F. 1957, pl. 76:21 and 22
[168] Haller 1954, p. 23

stem that ends with a distinct, wide stop below which is a long tang with square section. The angle of the shoulders is not at all sharp, and sometimes they curve slightly upwards as if they were slightly barbed (such as the right shoulder of Marlik 11 and the right shoulder of Marlik 10). Marlik 23, nevertheless, is unusually long and narrow compared to the others. Squared shoulders can serve much the same function as barbs, in that their sharp corners prevent easy removal of the arrowhead from a wound. However, the rounded corners of these examples indicate that the square shoulders likely had an aesthetic rather than functional purpose since it does not appear that they would have been very effective at catching in a wound.

All Type 5q-4s were cast in bronze, and despite the similarities of the Marlik examples, especially of the smaller three, they clearly all came from separate molds. These date to the latter half of the 2nd Millennium BC or the very beginning of the 1st, with only Marlik 23 possibly being as late as 750 BC. Hasanlu 63 comes from the Hasanlu IVB destruction layer, dating to the 8th Century BC. Therefore, Type 5q-4s seem to have been used in northwest Iran from the 2nd Millennium BC though the first quarter of the 1st Millennium BC. While other ribbed arrowheads, such as 5q-1, were adapted in iron and continued to be used in later centuries, this does not appear to have been done with Type 5q-4s.

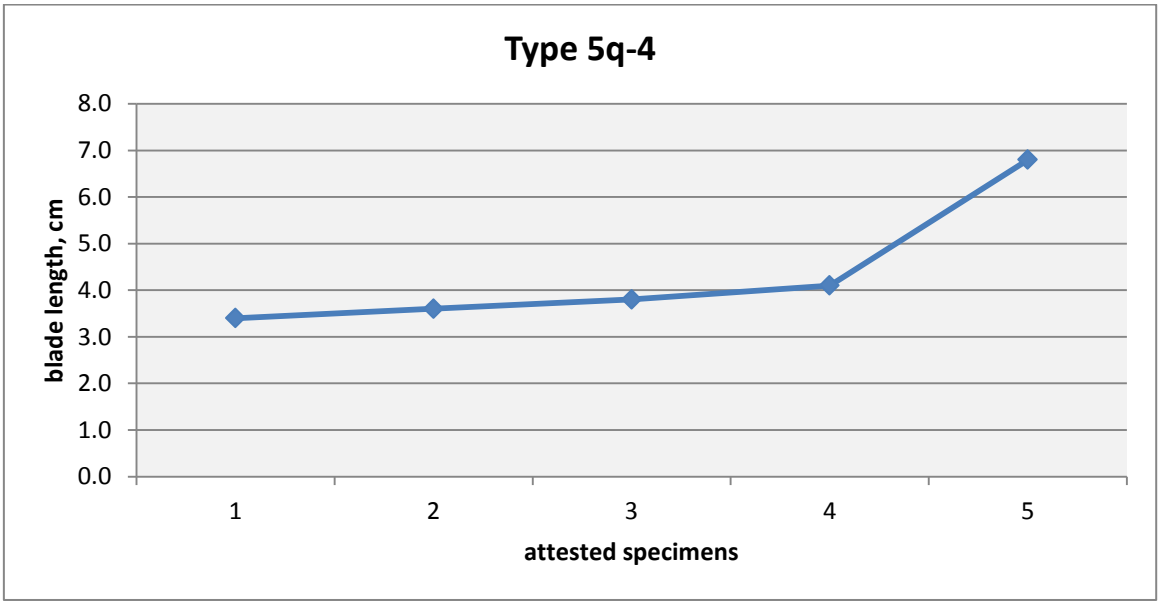

Figure 9.71: Sizes of Type 5q-4 arrowheads.

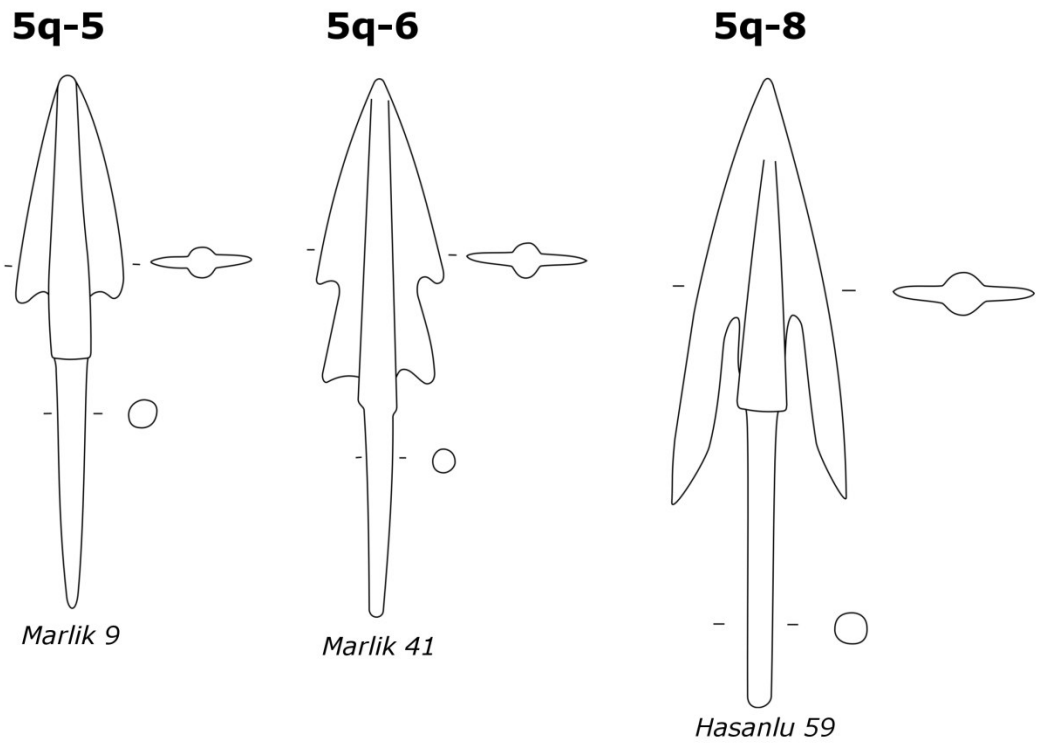

Figure 9.72: Types 5q-5 to 5q-8.

9.12.5.9. 5q-5 – ribbed leaf w/barbed shoulders & stopped tang

With ten examples, Type 5q-5 is one of the more numerous forms of ribbed arrowhead, only exceeded by the 16 Type 5q-1s and 19 Type 5p-1s. This is perhaps because other forms of shoulder – angles, concave and squared – served principally aesthetic purposes while barbs have a distinct functional purpose. All attested Type 5q-5s are bronze, and while bronze is more common than iron for ribbed Type 5 arrowheads, the lack of any iron examples is noteworthy.

Most 5q-5s have blades between 3.0 and 5.1 cm, but two are considerably larger. Marlik 31, with a 7.1 cm blade, could conceivably be a javelin head, and Marlik 18, with a large 10.9 cm blade, is almost certainly one. Even though Marlik 18 is so much larger than the others and most likely was used for a different kind of weapon, it nevertheless bears a very strong resemblance to Marlik 17, 19 and 20, all of which were clearly very well-made artifacts. All four of these points have well-defined midribs that turn into relatively long stems. The stop is distinct, marked by a slight raised ring at the very end of the stem. All four also have tangs nearly as long as their blades. As in the case of Types 5p-1 and 5g-4, this shows how both arrowheads and javelin heads can be nearly identical except in terms of size. The small Marlik 9 also somewhat resembles these points, however its blade is shorter relative to its length, its barbs are not so pronounced, nor is its stop, which lacks the slightly raised ring of the others.

The three examples from Hasanlu - all iron and dating to the 8th Century BC - are quite similar to each other. All have fairly long barbs and clearly defined stops located between the barbs rather than below them, as with the Marlik examples. Hasanlu 60 appears to possess metal rings like those on Karchaghbyur 8 (Type 5p-5), which bound the arrow shaft to the tang.

Sultantepe 1 and Marlik 31 are clearly unrelated to the others. Marlik 31 has no stem to speak of, just a step down in size from the midrib to the tang that forms a stop, and its barbs are somewhat rounded compared to the highly pointed barbs of the other Marlik examples. But Sultantepe 1 is more different still. It could be that corrosion has obscured features that would have otherwise made it appear more similar to the others, but in the state in which it was illustrated, it had only a hint of a midrib, its barbs were long and thin (almost like miniature swallowtails), and its stop vague at best. This could perhaps suggest a change of the form over time, as all of the Marlik examples date to the very beginning of the 1st Millennium BC at the latest, while Sultantepe is likely late Neo-Assyrian, some four-hundred or more years later. Nevertheless, Sultantepe 1 is bronze just like its earlier predecessors from Marlik, unlike the generally bronze Type 5p-1 which appears to have been later supplanted by the iron Type 5q-1.

Type 5q-5, therefore, is rather heterogenous as a type, but tended to be consisted within individual sites. They are attested both in burials and in destruction layers, and appear to have been principally used in northwest Iran in the late 2nd Millennium through the first quarter of the 1st Millennium BC. The one exception to this rule is Sultantepe 1, presumably dating to the late 7th Century, and which has a far less well-defined profile than the earlier Iranian examples.

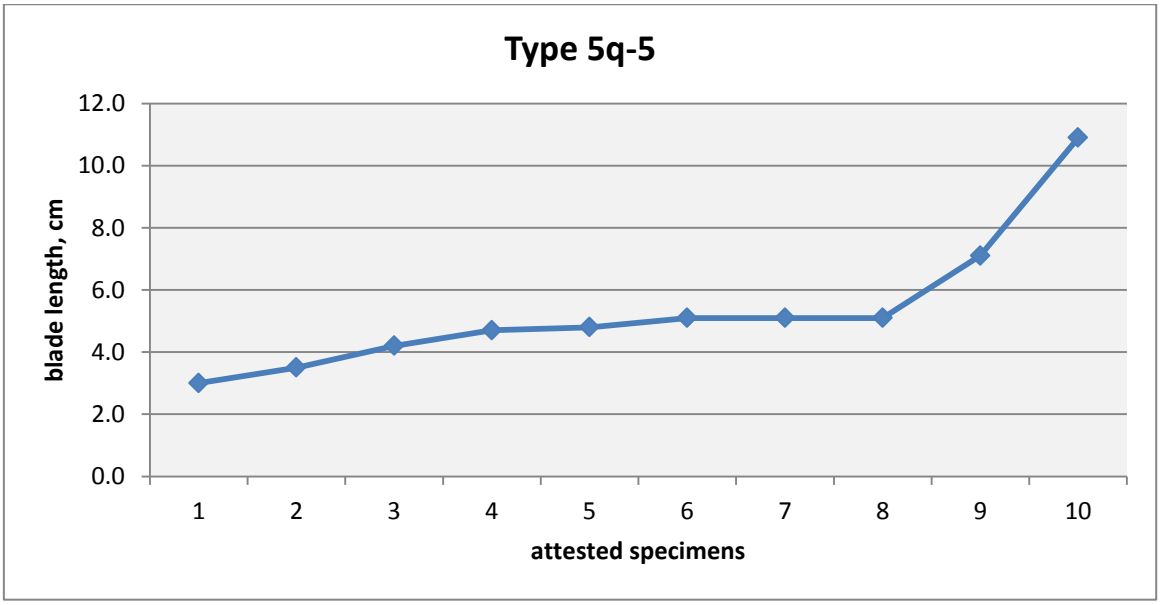

Figure 9.73: Sizes of Type 5q-5 arrowheads.

9.12.5.10. 5q-6 – ribbed leaf w/double barbs & stopped tang

Type 5q-6 is rare, with only one example from the sites surveyed, however double barbed arrowheads are known from other sites in Iran,[169] including three examples from Hasanlu. For a discussion of those and on double barbs in general, see Type 5b-6. Marlik 41 is given the very wide range of dates 1350-950 BC. It therefore most likely belongs to the 2nd Millennium BC rather than the 1st, though the iron Type 5b-6 arrowheads from Hasanlu show the form was still in use in the early 1st Millennium BC.

9.12.5.11. 5q-8 - ribbed swallowtail w/ stopped tang

Hasanlu 59, dating to the 8th Century BC, is the sole example of a Type 5q-8. Its 5.2 cm bronze blade has well-defined symmetrical swallowtails nearly equal in length to the rest of the blade. The stop is located between the swallowtails. It closely resembles the barbed Type 5q-5 arrowheads from Hasanlu (which are also bronze), thus its long swallowtail barbs likely represent a natural variation of Type 5q-5.

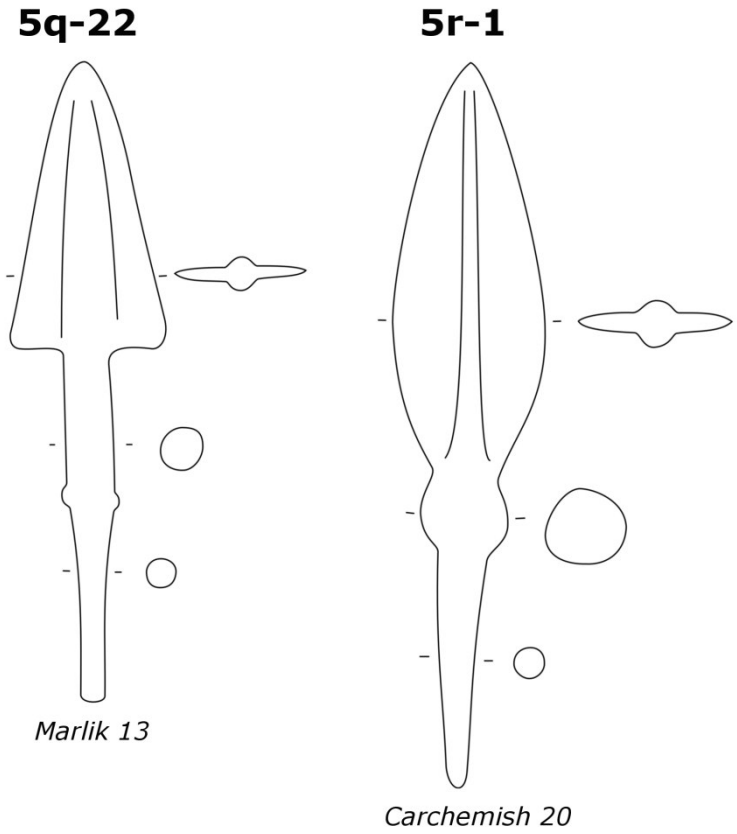

Figure 9.74: Types 5q-22 and 5r-1.

[169] see Muscarella1989a, p. 292, nos. 411 & 418 for similar examples.

9.12.5.12. 5q-22 – ribbed triangular w/squared shoulders & stopped tang

The four Type 5q-22s come from two sites, Assur and Marlik. The date of the Assur examples is unknown, however they have been included in this work due to their similarity to Sialk 77 (Type 5r-4). They all have heavy, deltoid blades (though the shoulders of Assur 57 are slightly curved), and thick midribs which provide correspondingly wide stops. The tang of Assur 54 has broken off just below the stop, and Assur 57 appears to still have some remnants of the arrow shaft still attached to its tang, which makes its stop appear somewhat smaller than the others. Marlik 13 has a very different profile, with a thinner midrib, a much longer stem, and a generally lighter appearance. As it is dated to 1450-950 BC, it most likely belongs to the late 2nd Millennium BC.

The blades of the Assur examples seem rather heavy for arrowheads (though unfortunately weights are not available for any of them). They may have been intended for heavier thrown weapons, such as darts. Their blade lengths of 2.2 to 3.8 cm seem small for javelins, though they would be perfectly ordinary for arrowheads. As darts are otherwise not attested in the Neo-Assyrian Period, it is impossible to say if these sizes are reasonable for dart points; the heads of Roman *plumbatae* (lead-weighted darts) are very different in form from arrowheads (with lead weights and strongly barbed heads), but are otherwise of a size comparable to arrowheads.[170]

9.12.5.13. 5r-1 – ribbed leaf w/round shoulders & bulbous stop

The two Type 5r-1s are very different from one another. Carchemish 20 is somewhat large, with a 5.1 cm blade, is made of iron and has a thick rib ending in a large, bulbous stop just below the blade. The stop, in particular, is reminiscent of those on Sialk 77 and Assur 56 (Type 5r-4), as well as Sialk 71 (Type 5r-20). Sialk 76, however, is a very long arrowhead with a long, narrow 7.4 cm blade. Its midrib is also narrow, extending to a very long stem at the bottom of which is a very modest bulbous stop. It dates to the 9th to 7th Centuries BC, however this does not indicate that the bulbous stop evolved from a smaller form to a larger form by the time the Carchemish example was made. Sialk 77 and Sialk 71, which have stops closely resembling that of Carchemish 20, also date to the 9th to 7th Century, which indicates a considerable degree of natural variation among bulbous stopped arrowheads.

[170] Bishop & Coulson 1993, pp. 161-162

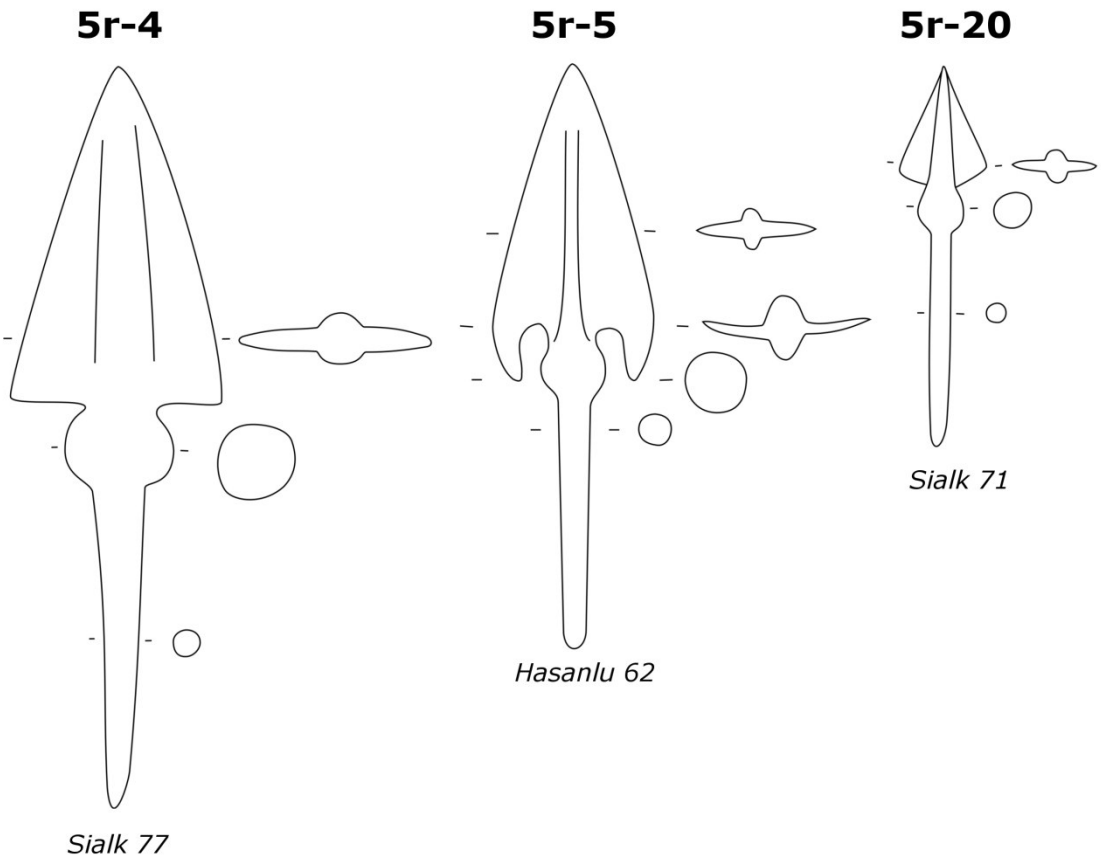

Figure 9.75: 5r-4 to 5r-20.

9.12.5.14. 5r-4 – ribbed leaf w/squared shoulders & bulbous stop

Type 5r-4 is represented by two very similar arrowheads: Assur 56 and Sialk 77. Sialk is somewhat damaged, however Ghirshman's reconstruction of its original profile seems reasonable. Both have heavy, almost deltoid blades, distinctly resembling Assur 54, 55 and 57 (Type 5q-2) and Sialk 71 (Type 5r-20). Type 5r-4 arrowheads tend to be larger, however, with blades of 3.6 and 4.5 cm. Sialk 77 is dated to the 9th-7th Centuries BC, and though the date of Assur 56 is uncertain, its remarkable similarity to Sialk 77, despite their widely-seperated find sites, suggest that Assur 56 is most likely of a comparable date.

The wide blades, thick stops and heavy build of these objects suggest that they may have been employed as darts or javelins rather than arrowheads, though if this is the case, it is worth noting that Sialk 71 (Type 5r-20) is nearly identical to them in terms of form and too small to be a javelin head. Sialk 77 and Assur 56 could still be a javelin heads, since there are other cases where certain javelin heads are essentially identical to arrowheads except in size (see Types 5p-1, 5p-2 and 5q-5).

9.12.5.15. 5r-5 – ribbed leaf w/barbed shoulders & bulbous stop

Hasanlu 62, dating to the 8th Century BC, is the only example of a Type 5r-5 from the sites surveyed. Its bronze blade is rather small at 3.2 cm, yet it has a well-defined form, with inward-curving barbs and a distinct bubous stop. These barbs are noticeably different from the long, slightly outward-flaring barbs of the more common Type 5q-5 from Hasanlu, suggesting that they may have had different origins.

9.12.5.16. 5r-20 – ribbed triangular w/angled shoulders & bulbous stop

The only example of a Type 5r-20 is Sialk 71. Its material is not stated, however it has an unusually small blade, a mere 1.7 cm long. Despite its unusually small blade, it nevertheless resembles Sialk 77 (Type 5r-4), which also possesses a bulbous stop. The dating of Sialk 71 is insecure, and Ghirshman states that it likely post-dates the Sialk B Cemetery, and therefore could be considerably later than the period covered by this work. Its similarity to Sialk 77, however, suggests that its dating is indeed correct.

9.12.6. 5u through 5y – FLATTENED RIB ARROWHEADS

Flattened ribs resemble regular ribs except that, as their name suggests, they appear flattened, forming a raised strip running along the centerline of the arrowhead. While some flattened ribs are linear, some conform to the overall shape of the arrowhead, such as the triangular flattened rib of the Assur 58 (Type 5y-22).

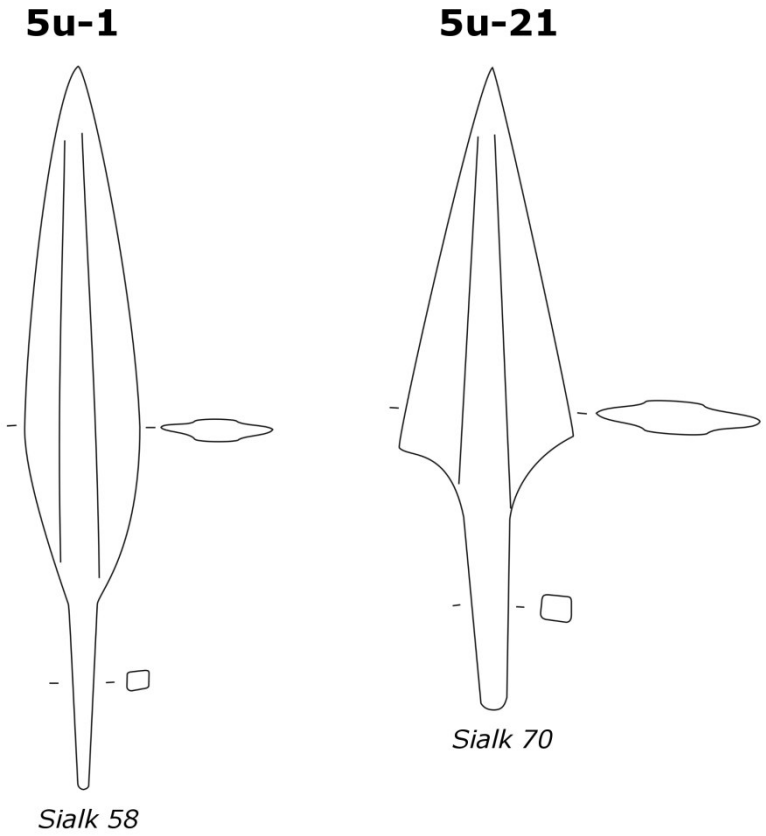

Figure 9.76: Types 5u-1 and 5u-21.

9.12.6.1. 5u-1 – flattened rib leaf w/round shoulders & unstopped tang

Unfortunately, none of the three attested Type 5u-1 arrowheads have section drawings, so their classification is somewhat hypothetical, and they could possibly have flattened rhomboid sections. I have classified that as flattened rib because the drawings resemble those of other flattened rib arrowheads.[171] It also appears that the flattened rib was far more common than the flattened rhomboid section. At Boğazköy, for example, there are over 40 arrowheads which clearly have flattened rib sections and only three that may have flattened rhomboid sections.[172] Nevertheless, an examination of the original artifacts would be necessary to confirm the nature of their sections.

Both Sialk 58 and 59 have very similar profiles, with long, narrow blades. The material they are made of is not stated, but given that flattened rib arrowheads are nearly always bronze, that is most likely in this case as well. They are fairly long, with 7.0 and 7.2 cm blades, but their narrowness and consequent lightness would ensure that they would be suitable for arrowheads. Hasanlu 58 is indeed bronze, though it has a somewhat different profile, with a wider, shorter blade.

[171] See, for example, Boehmer 1972, pls. 26-30
[172] Boehmer 1972, nos. 828 & 878, pls. 27 & 30 (these may appear to be flattened rhomboid simply because they are so thin that the drawing cannot clearly depict the raised rib) and Bohmer 1979, no. 3178, pl. 15 (which appears to be rhomboid on one side but flattened rhomboid on the other).

9.12.6.2. 5u-21 – flattened rib triangular w/concave shoulders & unstopped tang

Like the Type 5u-1 examples, the three Type 5u-21s do not have section drawings provided, and could conceivably have flattened rhomboid sections instead of flattened ribs. Sialk 72 is a very small arrowhead with an unusually short 1.8 cm blade that is nearly as wide as it is long. Because of this, relative to its size, it would have some difficulty penetrating a target, but would create a comparatively large wound. It is therefore most likely that Sialk 72 was intended to be a hunting arrow, probably for birds or small game where a heavy arrow would not be necessary. The concave shoulders allow the blade to be very wide yet light, since rounded shoulders would have required considerably more volume. Sialk 69 and 70 closely resemble each other, with very acute 5.2 and 5.6 cm blades. Sialk 70 is significantly wider, however. Archers would sometime carry arrows of a variety of distinct weights depending on the range they were firing at and the resilience of the target[173] (more resilient targets, such as armor, would require a heavier arrow, yet these would not be able to be shot as far as lighter arrows), so these arrowheads could represent part of such a set of arrows.

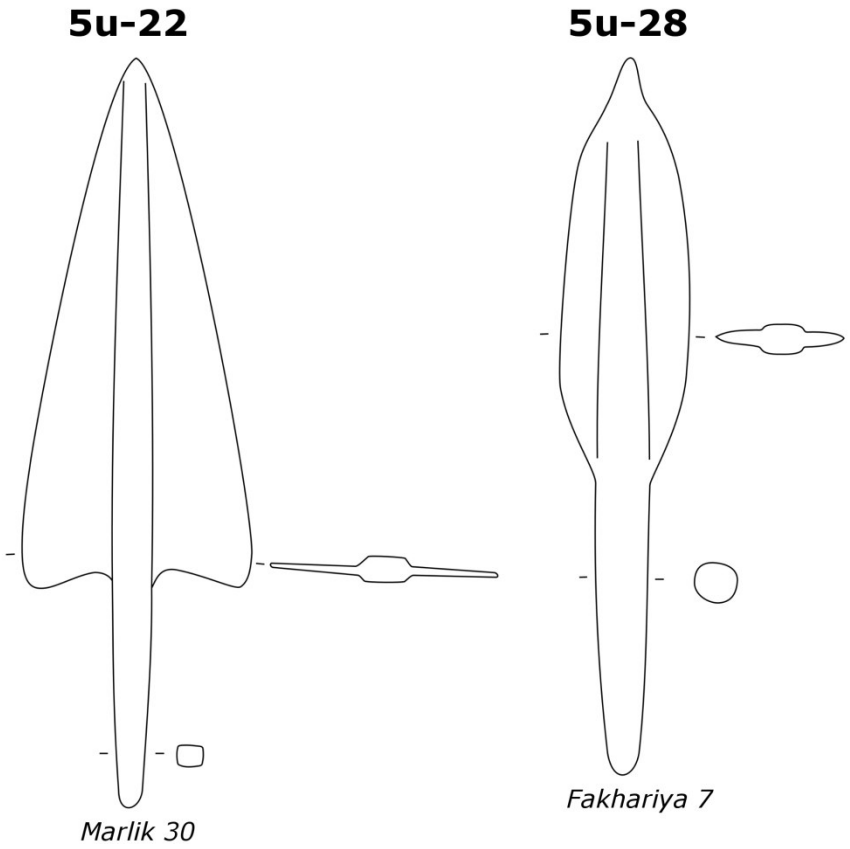

Figure 9.77: Types 5u-22 and 5u-28.

[173] Miller *et al* 1986, p. 189

9.12.6.3. 5u-22 – flattened rib triangular w/barbed shoulders & unstopped tang

Marlik 30, the sole example of a 5u-22 from the sites surveyed, possesses a narrow but distinctly flattened midrib. The shoulders do not have a particularly sharp angle, and while the left shoulder is nearly perpendicular to the center of the arrowhead, the right goes slightly up, as if it was minimally barbed. This feature has been observed on other square-shoulderd arrowheads from Marlik (see Type 5q-4) and certainly represents natural variation between squared and barbed shoulders, since Marlik also has yielded distinctly barbed arrowheads. Dating to 1450-950 BC, this arrowhead most likely belongs to the 2nd Millennium BC.

9.12.6.4. 5u-28 – flattened rib ogee w/round shoulders & unstopped tang

The sole 5u-28, Fakhariya 7, is a medium-sized bronze arrowhead with a wide flattened midrib which merges into a rather thick tang (though it may appear thicker than it should due to remnants of the arrow shaft). It closely resembles both Types 5a-28 and 5v-28, all of which come from Fakhariya, all of which are ogee in form.

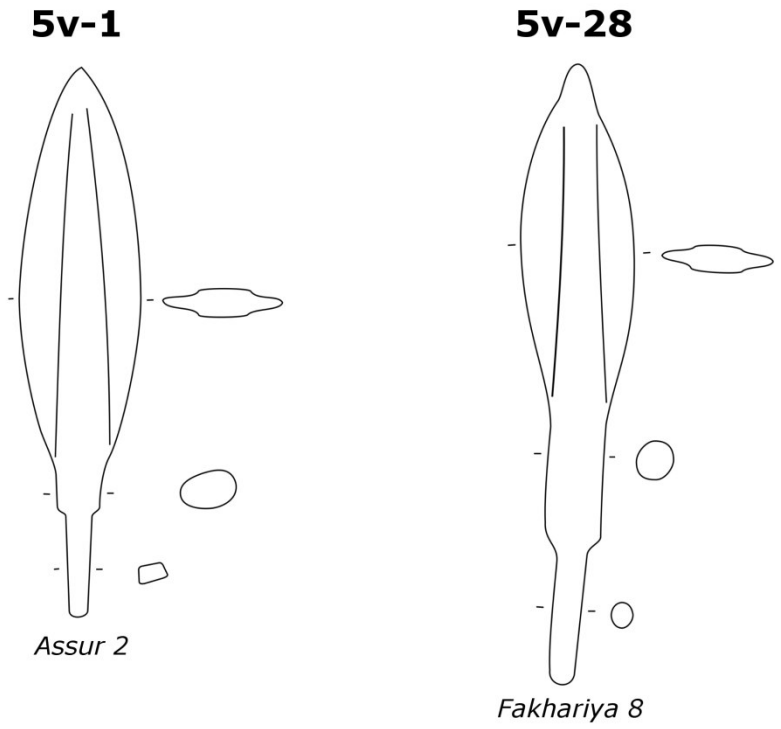

Figure 9.78: Types 5v-1 and 5v-28.

9.12.6.5. 5v-1 – flattened rib leaf w/round shoulders & stopped tang

Type 5v-1 is represented by one example from Assur and one from Hasanlu. Both are bronze, but otherwise are very different from each other.

In contrast to most finds from Assur, Assur 2 can be assigned to the Neo-Assyrian Period with relative confidence as it was discovered in a Neo-Assyrian grave.[174] Had it not been for that fact, it would appear to more likely belong to the 2nd Millennium BC when such flattened rib arrowheads were far more common.[175] Assur 2 has a small but distinct stop just below the blade and a short tang with square section, but is otherwise unremarkable except as a testament to the longevity of this form of arrowhead.

While its basic profile is similar to that of Assur 2 (except for having a more pronounced stem), Hasanlu 56 has two unique features. The flattened rib has several vertical grooves engraved in it, a feature which, as Thornton & Pigott observe, is also to be found on one of the spear heads from Hasanlu IVB.[176] Furthermore, the stem has "lappets" which are turned down to, as Thornton & Pigott presume, hold the arrow shaft in place. This feature is attested on dagger hilts from the very beginning of the 1st Millennium BC.[177] The lappets on these daggers are clearly intended to hold laths of wood or other perishable material that covered both faces of the hilt. These hilts had a lip running around their edges, creating a depression into which the hilt laths could be neatly fitted, and the lappets were formed by extending part of that lip so that the hilt would have a pronounced H-shaped section, and then the ends were bent down to hold the laths in place (see Figure 9.79).[178]

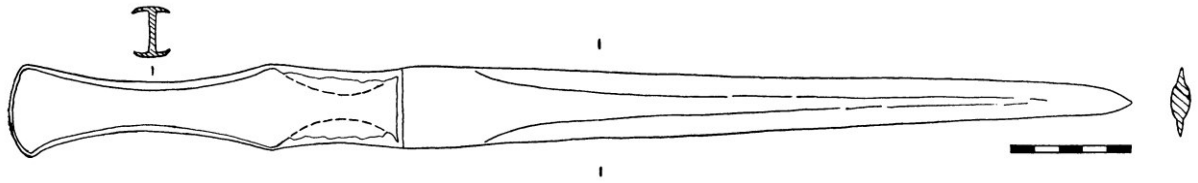

Figure 9.79: Lappet-hilted dagger. The lappets, located at the upper part of the hilt, are damaged on this example and their original shape indicated by dashed lines; after Maxwell-Hyslop 1946, pl. 4, no. 32.

Thornton & Pigott do not specify if Hasanlu 56 has lappets on both sides of the arrowhead or only on the illustrated side. If it shares the structure of the lappet dagger hilts, then it would have required a much more complicated mold than is usually required for arrowheads. If the lappets are only on one side, on the other hand, the balance of the arrow may have been negatively affected, since the bulk of the arrowhead would be to the side of the centerline of the arrow shaft. In any event, it is highly

[174] Haller 1954, p. 28
[175] For example, see Boehmer 1972, pp. 107-109, pls. 26-30
[176] Thornton & Pigott 2011, p. 143; the spearhead in question is HAS 64-440 (see Thornton & Pigott 2011, p. 152, fig. 6.14).
[177] Thornton & Pigott 2011, p. 143
[178] e.g. Maxwell-Hyslop 1946, pl. 4, nos. 32 & 32A

questionable that lappets would have been an effective way of holding the arrowhead to the shaft. Normally, a tanged arrowhead would be inserted into a hole bored into the foreshaft of the arrow (or, is the arrow did not have a foreshaft, inserted directly into the reed). Lappets on both sides of the arrowhead would require the arrow shaft to be split so the projecting ends could be gripped by the lappets. This, however, would weaken the shaft and make it more prone to splitting on impact, particularly given that the arrowhead would be placed in the split shaft like a wedge, and the only thing resisiting the force of impact would be the friction created by binding the shaft ends to the arrowhead. Thus it is perhaps more probable that the lappets were a decorative feature, intended to call dagger hilts to mind (just as the engraved rib may have been intended to call similar spear heads to mind), though they may also have functioned as a stop, with the arrow shaft pressing against the lower edge of the lappets.

9.12.6.6. 5v-28 – flattened rib ogee w/round shoulders & stopped tang

Type 5v-28 is represented by four examples, all from Fakhariya (like most other ogee arrowheads covered in this work). Three have blades of 5.4 to 5.5 cm, while one smaller example has a blade of 3.5 cm, suggesting two size categories.

On the whole, the Type 5v-28s closely resemble with Type 5a-28 and Type 5u-28 ogees, save for having stops on their tangs. Fakhariya 11, however, has a rather unusual profile. The flattened rib is evident only on the lower portion of the blade, while the upper part is unusually flat, almost as if it had been hammered flat. It also possesses an unusual protrusion corresponding with the stop, which is also evident on similar 2nd Millennium arrowheads.[179] Fakhariya 9 is also unique in its unusually robust stop, which suggests that it was joined to a shaft of greater thickness than usual, and thus was perhaps used as a javelin head (though its 5.5 cm blade would be perfectly suitable for an arrowhead).

Type 5v-28s were already in use by the later 2nd Millennium BC, as examples from el-Khadr attest.[180] A further example inscribed with the name of the king Nabû-mukin-apli proves that they were also still being used in the very early 1st Millennium BC,[181] and that the Neo-Assyrian finds from Fakhariya are therefore not anomalous.

[179] see Cross & Milik 1956, p. 20, fig. 2
[180] Cross & Milik, p. 20, fig. 2
[181] Salonen 1965, pp. 195-196, pl. 35

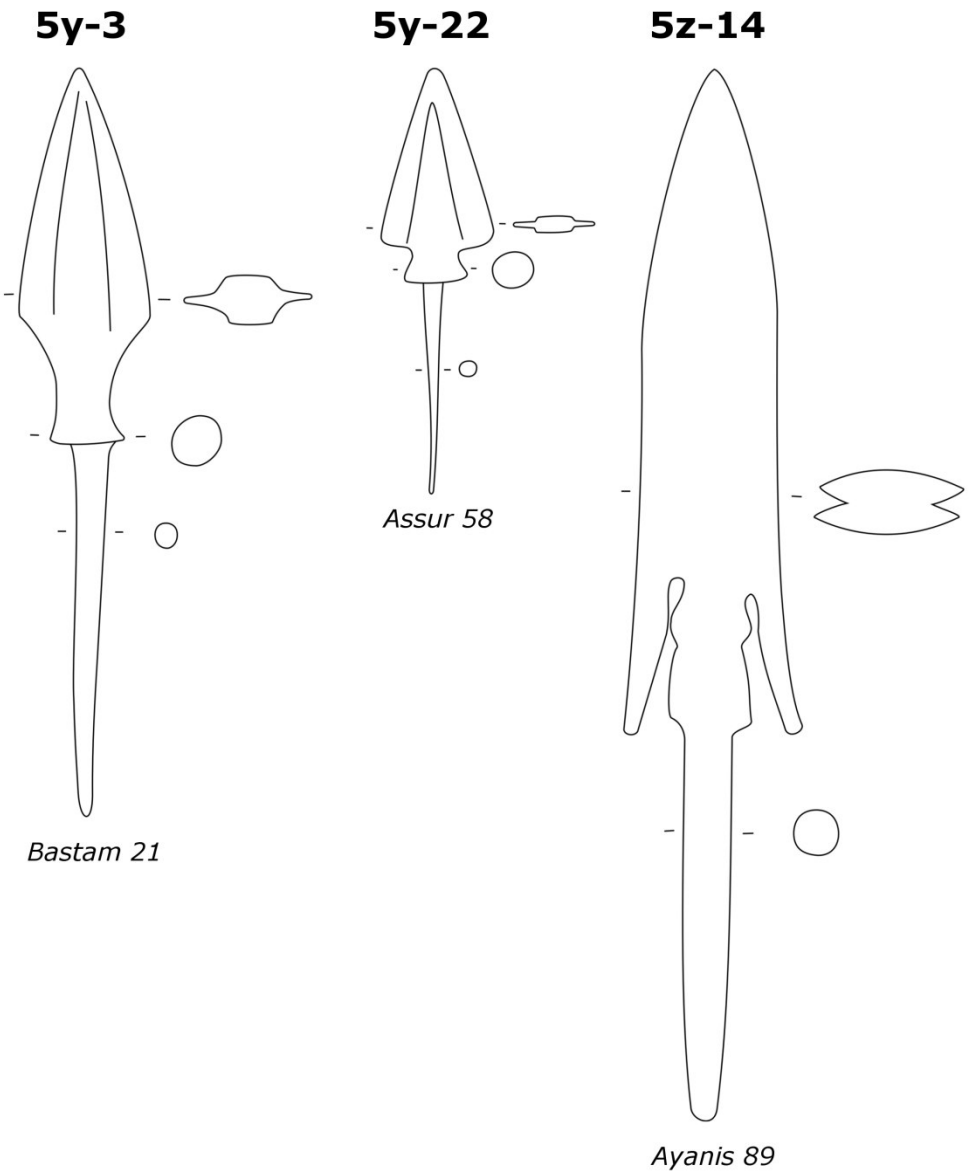

Figure 9.80: Types 5y-3 to 5z-14.

9.12.6.7. 5y-3 – flattened rib leaf w/concave shoulders & wide stop

The drawing of Bastam 21 illustrates the perils of assuming the section of an arrowhead from looking only at its profile. The profile drawing of Bastam 21 looks very much like it has a rhomboid section, however the section drawing clearly shows that it is actually a flattened rib (the drawing provided here in Figure 9.80 has been altered to fit the correct section). Bastam 21 has concave shoulders with sharp angles and a wide stop above a very long, thin tang. It was found in an unstratified context and Kroll assigned it to the Urartian period without providing any justification for that dating.[182]

[182] Kroll 1988b, p. 160

Stronach considerd this form of arrowhead the first step in development of wide-stopped arrowheads, which subsequently evolved to lozenge-shaped arrowheads (Type 5e-20) and then to chisel-tipped (Type 5e-57).[183] He based this sequence of development on the dating of a very similar arrowhead to a late 7th Century BC context at Sakçegözü, roughly 50 miles northwest of Carchemish.[184] However, the excavation report makes it clear that the stratum in which it was found was very thin and heavily disturbed by later intrusions,[185] therefore the dating of the artifact is suspect. Due to its similarity with other Hellenistic arrowheads (such as one example from Nemrud-Dağı[186]), Bastam 21 most likely also dates to the Hellenistic period (see Types 5e-20 and 5e-57).

9.12.6.8. 5y-22 – flattened rib triangular w/squared shoulders & wide stop

The small (2.3 cm blade) Assur 58 is the sole example of a 5y-22 from the sites surveyed. The arrowhead has a very distinct deltoid appearance, a flattened rib that reflects the triangular shape of the arrowhead, and a very wide stop surmounting a long, thin tang. The catalogue of the Assur Project suggests that it might be "Arabic" in date. It has been included in this work based on the similarity of its wide stop to other wide-stopped examples (such as the Type 5e-20 arrowheads from Carchemish). It bears a striking resemblance to several examples from Boğazköy,[187] however none of them are dated.

9.12.7. 5z – RECESSED EDGE ARROWHEADS

9.12.7.1. 5z-14 - long leaf w/recessed edge, barbed shouders and double stop

Type 5z-14 is represented by three examples from the sites surveyed. They all closely resemble the more conventional Type 5d-14, however Type 5z-14 has a recessed edge. In effect, where a normal arrowhead blade would taper to a sharp edge, there is instead a groove, providing two parallel sharp edges with a recessed area in between. This groove would have been a challenge to make, both by forging and by casting (and this feature is attested in both bronze and iron). If cast, it would require additional mold parts to prevent undercuts, and the most effective way to forge such a feature would be to make two thin arrowheads with identical profiles and then weld them together in the center only. Because of the complexity of both of these processes, it is most likely that the recessed edges were filed in after their initial manufacture, which would still represent a considerable amount of labor. One might expect that this would indicate that it was an important feature, however its function is quite obscure. The grooves could have been intended to increase the bleeding of the target while the arrow was still lodged in the wound by providing cavities for the blood to flow out of. How effective

[183] Stronach 1996, p. 475-476
[184] du Plat Taylor *et al* 1950, p. 123, fig. 33:1
[185] du Plat Taylor *et al* 1950, p. 82
[186] Stronach 1996, arrowhead ND-1956-1, p. 475, fig. 611:1
[187] Boehmer 1972, nos. 1603-1605, p. 154, pl. 53

this would have been is questionable, however. It may have also produced a wound that was more difficult to treat than a simple linear wound.

Though Type 5z-14 has such unusual features, it is attested in both bronze and iron. The Two examples from Ayanis date to the later 7th Century to the beginning of the 6th Century BC. The Nimrud example was found in a cache and thus, unlike most Nimrud arrowheads, may not date to the destruction of the city. Nevertheless, there is a high probability that all these examples are more or less contemporary.

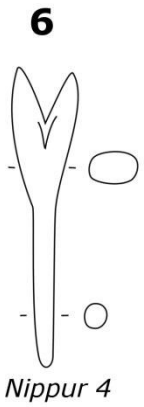

Figure 9.81: Type 6.

9.13. Type 6 – FORKED POINTS

Forked points are not commonly attested, but they cover a very wide span of time. At Nippur alone, there are forked points from the Early Dynastic period and the Neo-Babylonian Period.[188] Woolley discovered three forked bronze objects in the Royal Tombs of Ur, dating to the mid-3rd Millennium BC (see Figure 5.14).[189] A further example dating to the later 2nd or early 1st Millennium BC comes from Iran, though it is larger and has a much better-defined form than the other examples.[190]

McCown *et al* avoided assigning the objects a specific function, referring to them simply as "forked implements,"[191] however there are three primary possibilities. They could be a form of projectile point, separate nock pieces to be inserted into the back end of an arrow shaft,[192] or simply culinary appliances. All of them have tangs, but they are not particularly long, so even if they were used as forks for eating, they likely had a wooden shaft attached to them for ease of use.

[188] McCown *et al* 1967. pl. 154
[189] Woolley 1934, p. 305, pl. 227, nos. U.9358, U.6421, and U.7853
[190] Muscarella 1989a, p. 292, no. 415
[191] McCown *et al* 1967, pl. 154
[192] As Woolley suggested for the examples he found at Ur; Woolley 1934, p. 305.

While some or all of these objects could indeed be nothing more than forks, forked arrowheads are well-attested at other periods in history. In medieval Europe, forked arrowheads were used for hunting. The blades often were wider or had a more crescentic shape than the Near Eastern examples,[193] but they would function in the same way. They were primarily intended for use in fowling, since the feather of a bird are slippery enough that a leaf-shaped arrowhead striking it obliquely could slide off the feathers rather than penetrate. Because of the concavity of a forked arrowhead, if it struck obliquely with one point, it would tend to turn itself in towards the target rather than away from the target, deflecting the shot.[194] There are, however, scenes of birds being hunted from Khorsabad where the arrows are clearly illustrated, and in all cases, they are leaf-shaped,[195] so if forked arrowheads were used for hunting birds, they never completely replaced more conventional arrowheads for the same purpose.

[193] Jessop 1996, p. 194
[194] Stretton 2006b, pp. 145-146
[195] Albenda 1986, pl. 87 & figs. 76-78

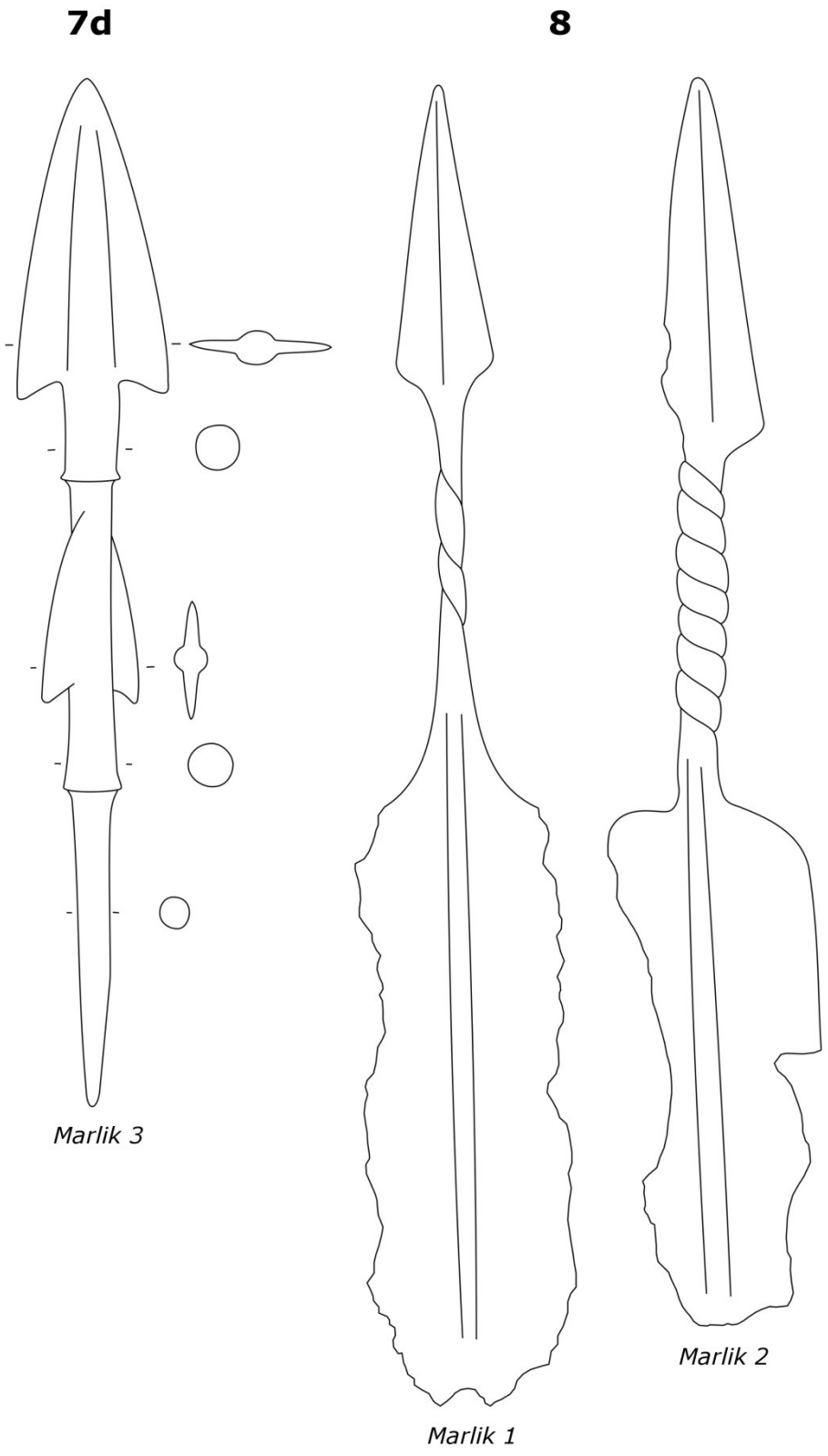

Figure 9.82: Types 7d to 8.

9.14. Type 7 – DOUBLE HEADED

Double headed arrowheads have, as their name suggests, two complete arrowheads, one above the other. Of the four possible kinds of Type 7 arrowheads, only Type 7d (barbed shoulders and with the lower blade rotated 90º relative to the upper) is attested among the sites surveyed. However, an unprovinanced Type 7b (barbed shoulders, but both blades in the same plane) from Iran is also attested.[196]

Two Type 7d arrowheads were found at Hasanlu,[197] though only one was published (Hasanlu 47). They were iron and date to the 8th Century BC. The blades are clearly distinct from one another, and if found alone, they would both be Type 5p-5. The blades are fairly small, the blades being 4.5 and 3.0 cm long, respectively, however since the barbs of the upper blade extend below the point of the lower blade, the entire blade section of the arrowhead is only 6.8 cm long.

Marlik 3 is made of bronze and is somewhat larger. Its blades are each 4.6 and 2.9 cm long, but because they do not overlap each other owing the the stem and stop of the upper blade separating them, the entire blade area is a full 9.1 cm long. While it is the only published example, Neghaban reports that "many" were found at Marlik, principally in Tomb 26.[198] Negahban does not discuss the potential date of these objects. Tomb 26, where most of them were found, also contained Negahban's Type IX spearheads,[199] which he dates to ca. 1250-950 BC,[200] so one may presume these points date to the same period, yet the Hasanlu example suggests that they continued to be used well into the 1st Millennium BC, albeit made of iron.

The function of these objects is anything but clear. Given that Tomb 26 also contained many perfectly functional weapons,[201] as did the destruction layer of Hasanlu IVB, one might assume that these were also intended for practical use rather than for ceremonial or decorative functions. And there can be little doubt that it certainly could have served as an effective weapon, though one wonders how likely they would be that it would penetrate a target deep enough to bring the second blade fully into play. Marlik 3 may be rather large for an arrowhead and may have been intended for a thrown weapon, such as a javelin, however there is no reason to think that Hasanlu 47 was not an arrowhead, especially given its resemblance to the double barbed arrowheads also found at that site (see Type 5b-6).

[196] Muscarella 1989a, p. 292, no. 418
[197] Thornton & Pigott 2001, p. 145-146 (Type IIB2)
[198] Negahban 1996, p. 277
[199] Negahban 1996, pp. 273-274
[200] Negahban 1996, p. 276
[201] Negahban 1996, pp. 19-20

9.15. Type 8 – COMPOUND BLADE W/TWISTED TANG

Compound blades with twisted tangs are also unique to Marlik, where two were found in separate tombs.[202] The top of these objects is a fairly conventional leaf-shaped point with a rhomboid section, attached to a squared tang. The tang is twisted several full turns, giving it a corkscrew appearance, and then it flares out into the top of a much wider two-edged blade with a pronounced rib. The large blade in both examples is badly damaged, so it is not known if it was supposed to attach to a hilt, like a sword, or terminated in some other manner.

While I have included these items in this typology due to the upper portion being, for all intents and purposes, a perfectly ordinary ribbed leaf-shaped arrowhead, these items would have been far too heavy for any practical use as arrowheads. Indeed, it is questionable if they would have served for javelin points, either. Negahban suggests that they could have been models of arrows, with the lower blade representing the shaft and fletching.[203] This is not a convincing argument, however. If these objects are representations of arrows, then they are highly abstract as it must be candidly admitted that the lower blade portion really does not in any way resemble an arrow shaft, still less fletching. It could have been a spear point of some kind, however the thin twisted tang would have been vulnerable and easily broken. The same fact also argues against it having been mounted on a hilt to use as a sword.

One possibility is that they were accoutrements for cult statues. A relief of Tiglath-Pileser III illustrating his Babylonian campaign shows a large cult statue being carried. The statue holds an object in its hands that looks very much like an inverted Type 8 (see Figure 9.83).[204]

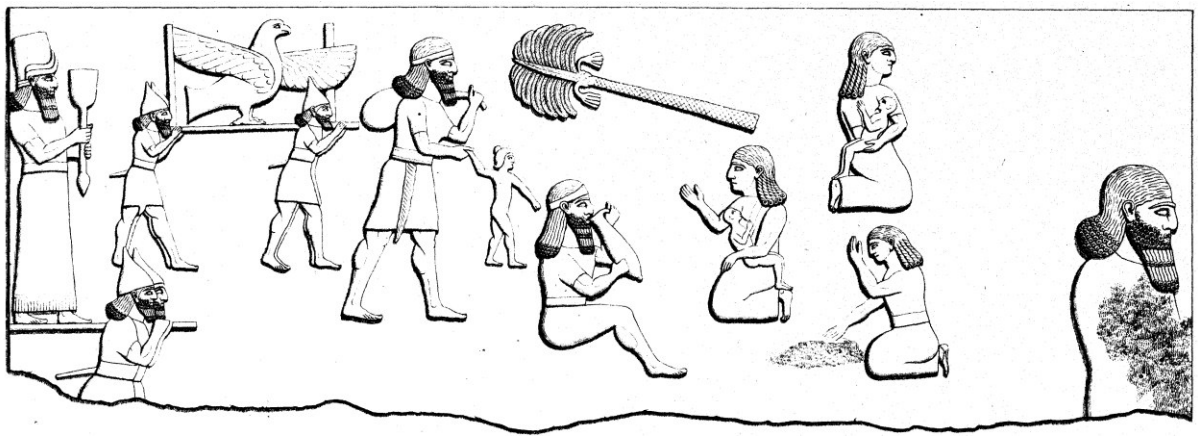

Figure 9.83: cult statue on left holding an object resembling a Type 8; after Barnett & Falkner 1962, pl.7.

[202] Negahban 1996, pp. 275-276
[203] Negahban 1996, p. 275
[204] Barnett & Falkner 1962, pl. 7

Negahban does not suggest a possible date range for either of these objects, however one tomb that contains one, Tomb 15, also yielded two Type IIB spear heads, which Negahban dates to ca. 1250-1050 BC,[205] so they appear to slightly pre-date the period covered by this work.

9.16. Type 9 – BONE

Bone arrowheads were no common at the sites surveyed in this work, attested only at Karchaghbyur, Marlik, Hasanlu, and Lachish. For a discussion of bone as an arrowhead material, see §6.2.4. The forms of bone arrowheads exibit a great deal of variation, and some of the forms may well not be arrowheads at all but some other form of tool.[206] A number of them are very simple cone-shaped objects with no hint of a tang of any kind. These include all of the Marlik examples as well as Hasanlu 77. Given that they lack a tang, it is very likely that these were not arrowheads at all.

Other bone arrowheads, all from Lachish, gradually taper to both ends from the middle, often with no clear indication of which end is the tip and which is the tang (e.g. Lachish 12, Lachish 82 & Lachish 11). These also may have been tools rather than arrowheads, though at least one similar object made of iron was also found at Lachish (see Type 1a-1, Lachish 20).

Some bone points take the form of round or square bodkins with clearly-defined tangs, akin to Type 1a-2 and 1c-2. All examples are from Hasanlu (Hasanlu 81, 79, 78, 82, and 80). Though these are far more likely to be arrowheads than the aforementioned examples, there is still a possibility that they served as a form of tool.

There were, however, unambiguous bone arrowheads from both Lachish and Hasanlu. Those from Lachish took the form of simple leaf-shaped arrowheads with unstopped tangs, like Type 5a-1 (Lachish 84, 83, 85 & 10). Those from Hasanlu, by contrast, have either squared (Hasanlu 72) or barbed shoulders (Hasanlu 74, 75, 71 & 70), and the remarkable Hasanlu 73 not only has disctinctly barbed shoulders but also a very pronounced stop. Karchaghbyur 3 falls somewhat between the Lachish and Hasanlu examples in terms of form, with a long, thin, triangular blade, small concave shoulders and a short tang (equivalent to Type 5a-21).

Tufnell speculated that perhaps bone arrowheads "were used in more peaceful pursuits" than combat given that eight of them (including Lachish 10, 11, and 12) were found on a stairway, apparently not associated with a destruction level.[207] Nevertheless, one iron arrowhead was found with the 8 bone

[205] Negahban 1996, p. 274 & 276
[206] See van Beek 1990 for a discussion of bone spatulae.
[207] Tufnell 1953, p. 119

ones, and further bone arrowheads were found in apparent destruction levels,[208] which suggests that they may indeed have been used during combat on occasion. However, they must have been a weapon of last resort, as they would have indeed been of questionable use for military purposes. The very light weight of bone would have reduced the ability of the arrow to penetrate the target, and bone not being nearly as resilient as metal, would be far more likely to break on impact.

Thus bone arrowheads were rarely employed in the early 1st Millennium BC, and while there are some objects that probably are bone arrowheads, many objects labeled bone arrowheads may well be tools rather than projectile points.

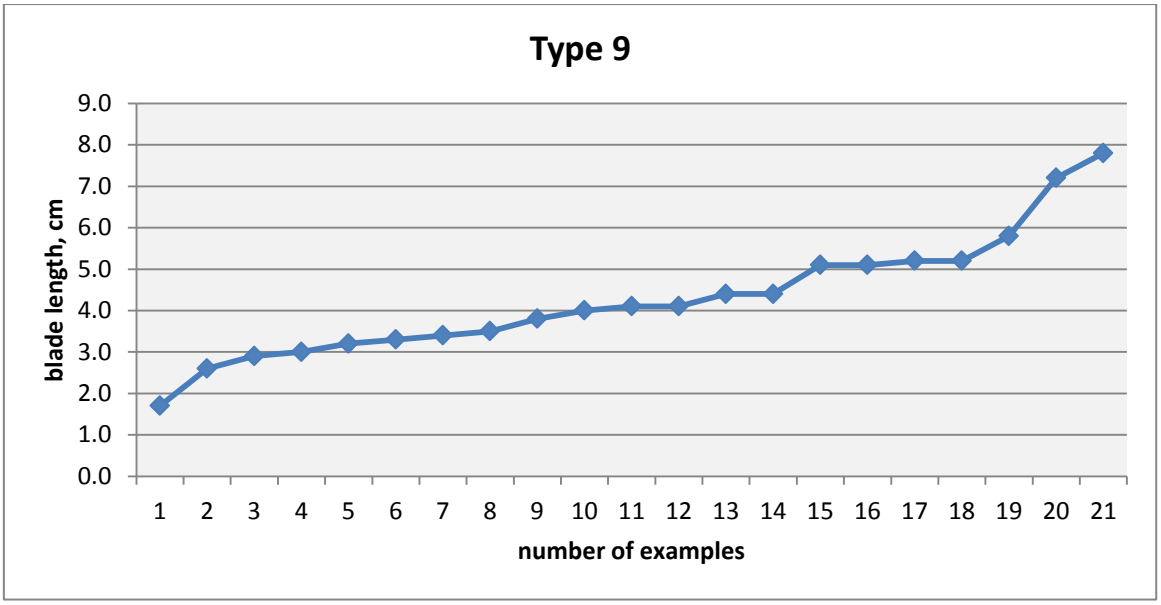

Figure 9.84: Sizes of Type 9 arrowheads.

9.17. Conclusions

The feature-based typology propounded in this work is based on distinct physical features in order to enable arrowheads to be classified in a consistent, unambiguous manner. While this approach has proved to have numerous advantages (discussed below), it also suffers from several drawbacks. Because the first feature encoded in the types is the section of the arrowhead in question, groupings of arrowheads based on other features will not be readily apparent from the typology since they will not appear directly next to each other. This is particularly the case with groupings that may have been perceived by the people who made and used the arrowheads, since it is probable that they did not see arrowhead sections as the prime factor differentiating arrowheads. Thus, any attempt to identify emic

[208] Tufnell 1953, p. 119

grouping must be done bearing in mind that those groupings may not in any way follow those of this typology, or may indeed be based on different, more subjective criteria altogether.

Swallowtails, for example, are spread throughout the typology (attested examples are 5a-9, 5p-7, and 5p-8). The same can be said of ogee arrowheads (5a-28, 5a-30, 5u-28, 5v-28), the distinctive point of which may warrant them being considered a single group. Long-bladed arrowheads (5a-14, 5b-10, 5b-14, 5d-14, and 5z-14), often with double stops and barbs, also appear to have close affinities with each other, and may have been a characteristically Urartian arrowhead type.

Conversely, some arrowhead types encompass arrowheads that do not appear to have any relationship to each other than sharing the same basic features. The barbs of Ayanis 70, for example, are thin and curve outwards, while those of Fakhariya 12 are thick and point directly downward, so while both share the same basic features (Type 5b-5), there is not likely any relationship between them. There is also a great deal of variability among the Type 5f-1 arrowheads; Marlik 33, for example, has fairly wide blades, with their widest point very near the tang, while Bastam 11 and even more so Carchemish 39 have narrow blades with their widest point closer to the middle. Toprakkale 14 also has a much thicker section than any of the others, being nearly a square bodkin.

These drawbacks are necessarily inherent in a feature-based typology, however. It must always be borne in mind that the ordering of the types in the typology is somewhat arbitrary, based on the most efficient manner for encoding the various relevant arrowhead features. Thus, groups of arrowheads that appear to be similar (though not identical) may have very different type designations, so these possible groupings must be discussed as they arise. Even when dealing with a specific form of arrowhead, it is important to keep an overview of the entire typology in mind so that other connections between arrowheads may be detected (such as similarity of shoulders, which is usually encoded in the last part of the type designation).

Despite these drawbacks, the feature-based typology has proven to be a valuable tool for classification and data analysis. For example, one interesting result of comparing blade lengths of arrowhead types with five or more specimens (as represented on the blade length charts) is that some have distinct groupings by length. Types 1c-1, 2-2, 5c-1, 5f-1, 5p-1, and 5q-1, for example, all show two or more groups or clusters of blade lengths. Lamentably, in these cases, there are insufficient examples with known weights to correlate those length groupings with possible groupings by weight, which may be an important consideration in future studies, since textual sources show that arrowheads were sometimes classed by weight in the ancient Near East.[209] Other arrowhead types all appear to fall into

[209] e.g. Miller *et al* 1986, p. 189

a single size group due to very similar blade lengths, such as Type 2-1 (all between 3.4 and 4.7 cm long) and Type 5a-28 (all between 6.0 and 8.4), though it is perhaps less remarkable in the latter case as all examples come from a single site (Fakhariya).

Other types, however, exhibit a wide variation in blade lengths, with no evident groupings. This is particularly the case when there are large numbers of arrowheads attested, such as Types 5a-1 and 5b-1. The comparatively poor preservation of the arrowheads, whose outlines (and weights) are often somewhat distorted by corrosion, may contribute to this. The margins dividing the groups, likely already small due to the presence of arrowheads from multiple sites and the natural variation to be expected in so large a collection of artifacts, could be obscured to the point of being unidentifiable.

Comparative blade length also helps to identify those examples which are of unusual size, and thus requiring additional scrutiny. Some are very small in comparison to others of the same type. For example, one Type 5g-1 (Toprakkale 10) is significantly smaller than the other examples of that type. Likewise, Toprakkale 22 has a far smaller blade than other Type 3a-16s, perhaps because it is of a different material and manufactured in a different way. Some arrowheads are significantly larger than comparable arrowheads. Assur 44, for example, is significantly longer than other Type 3a-14 arrowheads, and of a rather different shape because of that. Type 5g-4 includes one example, Marlik 24, which with a blade 9.8 cm long is over twice as long as most other examples, and similarly, Type 5p-1 includes the very large Sialk 9, whose 11.8 cm long blade is half again as long as the next largest. Its size makes it highly improbable that it was intended as an arrowhead. Similar examples can be found in other types, such as 5p-1, 5q-4, 5q-5, etc. Unusually small blade length may suggest an unusual function for the arrowhead (or a desire to obtain the longest range possible), yet the excessively large examples are perhaps more important. In them, we may begin to identify the upper limit of what may be considered an arrowhead as opposed to a javelin or spear head (as much as such an identification may be possible), not by imposing an arbitrary limit as previous definitions have done (see §6.5), but rather by an objective comparative study of the artifacts themselves. It also suggests that a simple division applicable to all such objects may not be possible.

Another benefit of the feature-based typology is that the geographical spread of types of arrowheads may be identified. Type 5a-1, for example, is attested in all areas covered by this study (though most heavily attested at Nimrud and Lachish). Other forms of arrowheads, however, are attested only in specific regions or at specific sites. The Type 4 quadrilobates, for example, are known only from one site, Carchemish, and Type 5g-4s are limited to Marlik. Other forms are more regional, such as Types 5q-4 and 5p-20, which are both attested only in Iran (at Marlik and Hasanlu for the former, Sialk and Nush-i Jan for the latter). Other examples are attested in larger areas, consisting of two or more contiguous regions, such as the Type 5p-7 and 5p-8 swallowtails, attested both in Iran and

Transcaucasia but not elsewhere. In some cases, the limited geographical distribution may be in part attributed to small sample size (particularly those where there is only one example). Nevertheless, some types which have larger numbers of examples exibit clear regional trends, such as Type 2-1, which is primarily attested in Transcaucasia and with a lesser quantity in Northern and Southern Iraq, yet with only one example from the Levant and none from Iran.

The context in which arrowheads are found (destruction layers, burials or caches) has been recorded when possible in order to determine if certain types of arrowheads are principally found in one or another, and what that may tell us about how they were used. Arrowhead caches (where the arrowheads are gathered together for storage or perhaps in a quiver, now lost) are fairly uncommon, attested principally at Lachish, with a few additional examples at Nimrud. The arrowheads contained in these caches were for the most part the normal iron Type 5a-1 and 5b-1 arrowheads that were in common use at both sites. Arrowheads found in destruction levels and burials are far more common, and for some sites, most or all of the arrowheads will belong to one category or another. Most Nimrud arrowheads come from its destruction layer, for example, and all arrowheads from Marlik and Karchaghbyur come from burials since both sites were cemeteries. It is therefore difficult to determine to what degree the depositional patterns reflect actual usage or merely the idiosyncracies of the sites in question. For example, all arrowheads found at Marlik were bronze, and many of them ribbed. The fact that they were certainly used as grave goods in no way proves that they were the standard form of arrowheads in use at the time, neither does it preclude that possibility. A number of types are found in all three contexts (e.g. Types 1a-1 and 5a-1), perhaps in part due to the fact that they are attested in considerable numbers. Others are attested in more specific contexts. The Type 5p-5 arrowheads from Marlik all come from burials, and those from Hasanlu and Carchemish come from destruction layers. Again, these contexts reflect the nature of the find sites, Marlik being a cemetery, and nearly all arrowheads from Hasanlu and Carchemish coming from destruction layers. Furthermore, Type 5p-7 and 5p-8 swallowtails are attested only in burials, though that may be because they were found only at the cemeteries of Karchaghbyur and Marlik. Other types of swallowtail arrowheads are attested in other contexts (such as Hasanlu 42 (5a-9) and Hasanlu 59 (5a-8), both found in a destruction layer). Therefore, the context in which an arrowhead is found can indeed tell us at least one way in which arrowheads were used at that particular site. However, because the idiosyncracies of individual sites can significantly influence interpretations about use, and because the number of sites is comparatively small, it is difficult to draw larger conclusions from these facts (e.g. if an arrowhead type is not attested in a specific context because it was not employed in that context, or because the sample it too small for it to have appeared in that context).

Finally, one of the most significant contributions of the feature-based “etic” typology is, perhaps ironically, the identification of possible “emic” arrowhead types. In principal, it would be desirable to

construct a typology based on the categorizations that the people who made and used the arrowheads used themselves, however the source material is insufficient for the task (see §9.1 and §9.2). Therefore, the typology is etic rather than emic (see §9.3), based on modern distinctions which may or may not relate to ancient distinctions. Nevertheless, though it was not intended for the purpose, this typology has enabled a number of possible emic arrowhead types to be identified by comparing arrowheads within individual type designations to determine how homogenous the type is. Highly homogenous types suggest that the makers of the arrowhead all had a shared ideal of the arrowhead form in question, which further suggests that the arrowhead form derived from a common source.

Some possible emic types are limited to a single site (e.g. the Type 5b-37 extended ogees from Fakhariya and Type 4 quadrilobates from Carchemish). It is perhaps unsurprising that craftsmen who live in the same city might make arrowheads which are similar in form. More compelling examples of possible emic types are those which are spread over a wider area, possibly including craftsmen belonging to different ethic or political groups. For example, the smaller Type 1a-2 bodkins appear to conform to the same ideal, despite being attested from Iran to the Levant. Likewise, the smaller Type 1c-1 bodkins also bear a strong resemblance to one another, though these are limited to a smaller geographical area (Northern and Southern Iraq) in the early 1st Millennium BC (though also attested in Anatolia in earlier periods). Furthermore, Type 2-3 hooked bilobates are remarkably similar in both size and shape (even possessing the same slender blades with their widest point approximately half way up the blade), even though they are attested in all regions covered by this study except Southern Iraq and Iran. While the distribution of these forms could be related to military activity, they could also indicate that the arrowhead forms in question were sufficiently well-defined that the ideal was closely adhered to by craftsmen over a wide area.

Other possible emic types cross the boundaries of the etic types presented in this work for, while they may share one or more characteristic features (such as wide stops or long blades with double stops), they differ in other characteristics (such as sections). These cases may help to identify which features or characteristics were signinificant to the makers of the arrowheads, and which were optional.

Long-bladed Transcaucasian arrowheads are a prime example. While several long-bladed arrowheads are attested outside of Transcausasia (Types 5a-10 and 5a-14), only Nimrud 250 (Type 5z-14) shares the other features which suggest that it is directly related to those from Transcaucasia. Those from Transcaucasia all bear a striking resemblance to each other, though the only distinct physical feature that they all invariably share is a long blade. These appear to be closely associated with Urartu, and at least one is inscribed with the name of an Urartian king.[210] Most have barbed shoulders, though round

[210] Found at Karmir-Blur, inscribed with the name of Sarduri II; Azarpay 1968, p. 26, fig. 7

shoulders are also attested (Type 5b-10). They also normally have ornamental double stops (Types 5d-14 and 5z-14), though single stops are also known (Types 5b-10 and 5b-14). They may either have lenticular sections (Types 5b-10, 5b-14, and 5d-14) or recessed edges (Type 5z-14), but they are never ribbed. Thus we find that this emic type is polythetic, composed not of a specific set of features applied to every arrowhead, but from a limited selection of features that ensures that the arrowheads will always appear similar, though not necessarily identical, to each other. An emic typology, therefore, can not be limited to specific physical features for each type, but instead would have to quantify which features are essential, which have resitricted options, and which are entirely optional.

Similarly, most socketed bronze bilobates and trilobates are very similar to one another, clearly deriving from a shared ideal of arrowhead form. They tend to be very consistent in size, and their blades are also typically fairly slender, with the widest part in the middle of the arrowhead. They also have either a long or a short socket, and may or may not have a hook. The shape of the shoulders vary to a much greater degree, indicating that shoulder shape was not a significant part of the emic types in question. Thus, like the long Transcaucasian arrowheads, socketed bilobates and trilobates are characterized by certain universal features as well as a limited range of options for certain features. What is more, they maintained this consistency over a very wide area, as some form of socketed bronze arrowhead is attested in every region covered by this work. Such a degree of consistency over such a wide area supports the theory that socketed bronze arrowheads had recently been introduced into the Near East and spread rapidly amongst the indigenous peoples there. They had not yet had time to evolve regional variations, so they still conformed to a well-defined and universal ideal form for socketed bronze arrowheads.

Emic types may also be indicated when arrowheads mimic the form of other arrowheads. Uruk 14 (Type 5q-2) looks so similar to a bilobate with a long socket (Type 2-2) that it is difficult to conceive that it was done by chance. Far more likely, its mold was deliberately made to case an arrowhead which resembled the popular Type 2-2 without requiring the complexities to cast a socket. Conversely, two socketed bronze bilobates – Uruk 17 (Type 2-1) and Carchemish 15 (Type 2-2), mimic the form of ribbed leaf-shaped arrowheads (Type 5p-1 or 5q-1). The widest portion of their blades is near the bottom, like typical ribbed leaf-shaped arrowheads, while the blades of conventional bilobates are widest in the middle. Carchemish 15 dates from the late 7th Century BC and Uruk 17 from the 7th-6th Century BC, so both were most likely made after socketed bilobates has already been introduced into the Near East. It is therefore perhaps surprising that they attempted to mimic leaf-shaped arrowheads when clearly socketed bilobates and trilobates were very popular and themselves being mimicked by other arrowheads (e.g. Uruk 14 mimicking a socketed bilobate and the quadrilobates from Carchemish mimicking, or at least approximating, socketed trilobates). However it should be observed that Neo-Assyrian iconography suggests that ribbed leaf-shaped arrowheads had

high-status associations (see §9.2), so the craftsmen who made the molds for these arrowheads may have wished to consciously emulate this native Near Eastern form, with its connotations of status, than to emulate the much more common "foreign" style of the recently-introduced bilobates. Thus, in Uruk 14 as well as Carchemish 15 and Uruk 17, we find two different and contradictory attempts to adapt arrowheads to ideal forms for which they are not suited.

10. General Conclusions

Archery played a major role in Assyria in the early 1st Millennium BC. While there is a vast amount of source material to illuminate the manner in which archery served as an ideological symbol, how it was employed in the military, the actual forms of artifacts, etc., these areas do not always overlap. A thorough study of Neo-Assyrian archery equipment must, therefore, focus on the areas for which diverse source material exists, and draw connections between these areas when possible.

The bow was used as an attribute of various deities and symbolized the divine mandate of the king, thus asserting the legitimacy of his rule (see §3.3 and §3.5). It also served to glorify the king and symbolize his military power, and that of others. The "turned bow," for example, indicated that the king's power was such that he need not be ready for immediate action in the presence of enemies (see §3.7), and the "heroic overdraw" portrayed the king as having super-human strength (see §3.8). Likewise, the loss of ones bow served as a symbol for the loss of military capacity, such as in treaty oaths, where Ištar is called upon to break the bow of the treaty breaker, or the depictions of the Elamite officer cutting his own bow, symbolizing his surrender to Assyria (see §3.4).

Royal hunting is well represented in textual and iconographic sources (see §4.1). The king is frequently depicted hunting with a bow (and also at times with a spear and, more rarely, a sword). These representations doubtless conveyed multiple ideological messages, not only glorifying the king by portraying him as a brave and successful hunter, but also symbolized the triumph or order over chaos. Private hunting is principally attested through seal iconography, though some scenes on private seals are clearly of a mythological nature. The meaning of hunting on private glyptic is not known as there are no texts to explain the symbolism. Some arrowheads reviewed in the typology may have been intended specifically for hunting. Type 1a-7 stunning bolts and Type 6 forked points may both have been intended for fowling, while wide blades designed to produce large wounds in "soft" targets (such as Type 5b-37 extended ogees) may have been intended to hunt game. Nevertheless, the arrowheads depicted in hunting scenes in Assyrian iconography are invariably conventional leaf-shaped arrowheads, with or without ribs.

Archery was an essential element of the Assyrian military throughout the Neo-Assyrian Period (see §4.2). The three principal roles in which archers served – chariotry, cavalry, and infantry – all evolved over the course of the Neo-Assyrian Period. The importance of chariotry decreased (except where it served as a status symbol) as the role of the calavry expanded, doubtless due both to the greater efficiency of cavalry in terms of the numbers of men and horses required and also because they could operate in terrain that would be impassable to chariots. Infantry archers are ubiquitous throughout the period, however their role and equipment changed somewhat over the course of the

period, particularly with the first evidence of the widespread use of both siege shields and auxiliary archers in the reign of Tiglath-Pileser III. Changes to archery equipment are more difficult to trace. Assyrians are principally shown firing triangular bows throughout the period (see §5.1). The standard form of quiver, with a round bottom, was depicted throughout the period, though other forms appear only later. The square bottomed quivers with turned rods first appear in the reliefs of Sargon II, for example, and tasseled quivers first appear in the reliefs of Tiglath-Pileser III (see §5.2). The most significant change to arrowheads was the introduction of socketed bronze arrowheads in the 7th Century BC, however there are no identifiable depictions of these in Assyrian iconography. This may be due to several factors: most iconography did not depict arrowheads with sufficient detail to determine what type they are, the introduction of such arrowheads may post-date the majority of Assyrian iconography, or the Assyrians may have used them, but artistic conventions caused them to continue depicting Assyrians firing more conventional forms of arrowhead.

The Neo-Assyrian Period is exceptionally rich in iconographic sources with depictions of military equipment. Barron compared these depictions to actual artifacts in order to determine, among other things, how accurately iconographic sources represented the military equipment that was in use at the time.[1] Unfortunately, the comparison of iconography to artifact is rarely possible with archery equipment. Of all forms of archery equipment, only quivers allow some degree of cross-referencing as they are commonly depicted, and a number of the bronze covers for them survive (see §5.2). While bows are frequently depicted, sometimes with considerable detail, there are no surviving artifacts to compare them to (see §5.1). The reverse is true with arrowheads – there are a multitude of finds, however the iconography rarely depicts them with any detail at all (see §9.2). The vast majority of arrowheads in iconography are simple leaf-shaped arrowheads, usually with round shoulders, however ribbed arrowheads tended to be used more frequently when the individual wielding them was of higher status and depicted at a fairly large scale (so the detail would be noticed by the viewer).

While a handful of arrowheads (or possible arrowheads) from the early 1st Millennium BC were made of bone, nearly all were of copper alloys or iron (see §6.2 and 6.3). Availability of these metals does not appear to have been a major factor in which was chosen - both iron and bronze were widely available in the early 1st Millennium BC. Furthermore, while iron theoretically has superior metallurgical properties for weapons than does bronze, smiths of the early 1st Millennium do not appear to have been able to effectively manipulate the carbon content of their iron objects, thus negating much, if not all, of the advantages of iron. Both of these kinds of metals had their own ideal manufacturing techniques (forging for iron and casting for bronze), and those techniques to some degree dictated the types of forms that could effectively be made with those metals. The typology

[1] Barron 2010

presented in this work supports this conclusion, as some arrowhead forms are attested primarily or entirely in one metal or the other. Leaf-shaped arrowheads with lenticular sections and tangs (Types 5a-1 and 5b-1, for example) were largely made of iron in the Neo-Assyrian Period, though they are derived from forms of bronze arrowheads used in the late 2nd Millennium BC. Iron was generally favored over bronze in the early 1st Millennium BC (tools were typically also made of iron, for example), and these arrowhead forms lent themelves to forging. Ribbed and rhomboid arrowheads are more difficult to forge in iron, thus we find a greater proportion of them are bronze. For example, 5 the 9 Type 5f-1s are bronze, as are 10 of the 19 Type 5p-1s and all Type 5q-5s, though there are exceptions, such as Type 5q-1s, of which only one of 16 examples is bronze. Most noteworthy in this regard are socketed bilobates and trilobates. Of the 191 examples of these forms reviewed in this work, only 6 were iron (and 3 of unknown material), thus a full 95.3% of socketed bilobates and trilobates were made of bronze. This overwhelming prevalence is due to the difficulty of forging the small sockets of arrowheads in iron compared to the relative ease with which they could be cast in bronze (see §6.3.5), and the popularity of socketed arrowheads after their indroduction into the Near East in the 7th Century BC partly reversed the trend which had favored iron as the material of choice for arrowheads from the beginning of the 1st Millennium BC. There is thus a close relationship between arrowhead form and arrowhead material.

The widely-held assumption that casting in bronze is more suitable for mass production (and that this was responsible for the resurgence of bronze as a material for arrowheads) has certainly been exaggerated. When a bronze arrowhead is cast, it cannot simply be removed from the mold and attached to an arrow since the plug for the pour gate must be removed first. Given that (at least for socketed bronze examples) this pour gate was at the tip of the arrowhead, it could not be simply chiseled off. The plug had to be carefully filed away until its remnant formed the tip of the arrowhead, doubtless a time-consuming process that had to be performed for every single arrowhead. While more elaborate forms of iron arrowhead may have still required more time to manufacture than that required to cast and complete a bronze arrowhead, the simpler forms may have been faster to make. This is particularly evident with the small Type 5a-1 arrowheads. They appear to have been manufactured very rapidly from rods of iron merely by flattening the end into a blade shape (often quite irregular) and then, leaving a small amount of rod attached to serve as the tang, cutting it off the rod. Thus, forging could be quite suitable for mass production, provided that the form being made was not overly complex.

The typology presented in this work is intended to be a flexible tool to enable systematic classification and comparison of arrowheads (see §9). As the typology was intended to be based on specific features of arrowheads, those features (such as varieties of stops or shoulders) had to be clearly defined.

Comparison of the blade lengths of arrowheads has shown that some types are remarkably consistent, with all examples roughly the same length (e.g. Type 2-1), while others show distinct groupings by length which may correspond to groupings by weight (e.g. Type 5f-1), which 2nd Millennium BC texts indicate was at least one way in which arrowheads were grouped by the people who used them. Other types, however, show an apparently random distribution of blade lengths. In these cases, it is likely that the modern etic type simply does not correspond to any actual ancient emic arrowhead type. Blade length comparison also helps to identify blades that are of unusual size, which is particularly significant for objects identified as arrowheads but which have blades significantly longer than other comparable arrowheads (e.g. Type 5g-1). It is not possible to make a definitive distinction between arrowheads and other projectile points, such as javelin heads, however in cases where some examples are significantly larger than the others, it is perhaps more likely that they were made for a weapon other than an arrow.

By including sites from a variety of regions, this typology also enables a systematic study of the distribution of arrowhead types. This can indicate which forms are attested over a wide area (e.g. Type 5a-1) and those that are limited to smaller geographical regions or even individual cities (such as the quadrilobates, attested only at Carchemish). Of course, as not every archaeological site is covered by this survey, it is possible that some types have a greater geographical spread than is suggested here. In addition, the context in which arrowheads are found can be compared to determine, if possible, something about how the arrowhead types were used. If an arrowhead type was used principally for grave goods, then it should be primarily attested in burials, for example. However, the idiosyncracies of the sites surveyed (some sites are contain only burials, like Sialk, while at others, most finds are from destruction levels, like at Nimrud) makes general comparisons difficult. A larger sample may allow a more effective use of arrowhead deposition contexts.

The dating of the arrowheads surveyed in this study was often complicated by either their being given only a very general date (such as “Neo-Assyrian” or “Urartian”), or, conversely, a date far more specific than the evidence warranted due to assumptions about the relation between destruction layers and historical events. This latter issue caused particular complications. The ability to date an artifact to a specific year based on a historical event clearly would be of great usefulness, however, in most cases, the relationships between destruction layers and historical events were posited without an objective method, and because of that, often relied on assumptions. Thus, an objective and systematic manner for addressing the connections between such destruction layers and historical events had to be developed.

The requirement that destruction layers be complemented by another archaeological datum – a major change in settlement patterns, in this case - to correlate them with the historical event allowed the destruction of Assur and Nineveh to have a firm association with the destructions of 614 and 612 BC. Thus, artifacts from their destruction layers could be given specific dates. At other sites where the settlement patterns did not significantly change following the destructions, such as Carchemish and Lachish, firm associations were not possible since there is always the chance there were other destruction events not recorded in surviving historical sources.

Furthermore, a closer scrutiny of the historical texts used as the basis for assumptions about the dates of destruction layers also revealed a number of assumptions, such as that the Babylonians necessarily destroyed Carchemish after defeating the Egyptian army. The historical texts in question are actually quite ambiguous on the matter, merely stating that the Egyptian army was defeated after it left Carchemish. Why, then, should one assume that Carchemish was also destroyed at this time? It is possible, to be sure, but far from certain. Somewhat more surprising, however, was the case of Nimrud, which has long been assumed to have been destroyed around the same time as Nineveh and Assur. However, contemporary texts do not specifically mention it. Therefore we cannot assume that it was necessarily destroyed specifically in 614-612 BC. The archaeology indicates that it was indeed destroyed at the end of the Neo-Assyrian Period, but we cannot date it more precisely than that.

Modern scholars (from the late 19th Century on) have also sought to assign ethnic designations to objects, most significantly (in relation to this study) to socketed bronze arrowheads in the pre-Achaemenid Near East (see §7). These have been generally attributed to the Scythians, or more specifically trilobates to the Scythians (and sometimes Medes) and bilobates to both the Cimmerians and Scythians. However, attributing ethnicity to objects or styles of objects is highly problematic, frequently involving assumptions that relate certain material assemblages to historically attested ethnic groups. Ivantchik has demonstrated perhaps the most systematic method of equating artifact style to ethnicity, however even this is based on some assumptions, such as that all "early Scythian" material in Anatolia was deposited by Cimmerians, and he also placed perhaps too much reliance on ancient sources, which are far from infallible.

Nevertheless, there clearly were perceptions in the early 1st Millennium BC Near East that certain forms of archery equipment were somehow characteristic of certain ethnic groups. Some Neo-Assyrian and Neo-Babylonian sources apply ethnic designations to items of archery equipment, such as Elamite bows and Cimmerian arrows (see §9.1). Precisely what these designations signify is never made clear, however it is most probable that they referred to styles that were, for whatever reason, associated with those ethnic groups. It does not necessarily mean that the objects were actually made by or derived from those ethnic groups.

An analysis of the typology presented in this work does, however, suggest a number of possible emic arrowhead types, such as the smaller Type 1c-1s and long-bladed arrowheads from Transcaucasia (Types 5b-10, 5b-14, 5d-14, and 5z-14) (see §9.17). The ethnic designations in textual sources are unfortunately too vague to determine if any of these may correspond with the identified emic types, nevertheless they do suggest the ways in which arrowheads would have been categorized by the peoples who made and used them. Perhaps the most significant factor is that emic types appear to allow a certain degree of variability, where there are one or two universal characteristics, a limited selection for other characteristics, and still other characteristics that are entirely optional. For example, the long-bladed Transcaucasian arrowheads have long blades, usually have double stops (though single stops are possible), barbed shoulders (though round shoulder are possible), and lenticular sections (though recessed edges are also possible); other features are optional. If the ethnic designations used in texts did relate primarily to the arrowheads (rather than some other feature of the arrow), then the types they designated probably correspond to more than one of the etic types presented in this typology.

The typology presented in this work has yielded valuable results, and expanding it both chronologically and geographically would make it still more useful. Partly due to being limited to the early 1st Millennium BC, but also because of the imprecision with which many of the arrowheads surveyed were dated (to say nothing of those that cannot be dated at all), this typology does not show a great deal of chronological development. In order to maximize the utility of this typology as a tool for archaeologists, future study should expand the time period it covers (ideally from the introduction of metal arrowheads in the 3rd Millennium BC until bows were effectively replaced by firearms). Then, even if an arrowhead is from a disturbed context or a surface find, it should be possible to assign it to at least a rough date and also easily locate comparanda.

Expanding the number of sites surveyed would also be beneficial. While all the principle forms of arrowheads are covered in this typology, there are doubtless less common variants that did not appear at any of the sites surveyed. The feature-based typology makes it easy to add new types, however; so when new features are identified, they can be easily added to the type charts.

The typology presented here, therefore, must serve as a proof of concept. In order to make it a truly effective tool for archaeologists and researchers, it should be expanded in the number of sites it surveys, but much more importantly, it should be expanded chronologically, ideally to cover the entire time span in which metal arrowheads were in use.

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University of Wisconsin *Madison, Wisconsin, USA*	Bachelor of Arts in Classical Humanities/ History/History of Culture, 1997
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University of Vienna *Vienna, Austria*	PhD in Altorientalistik (in progress)

Publications:

2012	Review of *Den Dolch betreffend: Typologie der Stichwaffen in Ägypten von der prädynastischen Zeit bis zur 3. Zwischenzeit by* Susanne Petschel, Wiesbaden: Harrassowitz, 2011. *Wiener Zeitschrift für die Kunde des Morgenlandes* 102, pp. 369-371.
forthcoming	"Observations on socketed bronze arrowheads in the early 1st Millennium BC," in Ben Yosef, E. and Goran, Y. (eds.), *Mining for Copper: Essays in Memory of Professor Beno Rothenberg.* Tel Aviv: Institute of Archaeology of Tel Aviv University.

Conference Presentations:

2008	"The square pattern on Assyrian garments: armor or textile decoration?" at the 6th International Congress on the Archaeology on the Ancient Near East, Rome, May 2008.

Field Work:

1996	Tell Madaba Project, Jordan (excavation of EBA levels)
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DISSERTATION

Archery Equipment in the Neo-Assyrian Period, Volume II: Appendices and Plates

Band 2 von 2 Bänden

verfasst von

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Appendix A: Arrowheads by Site

I have attempted to isolate and record this information for each individual arrowhead, as far as the published data will allow.

- **Type** – the type of the arrowhead according to my typology.
- **Date** – the date, period, or date range to which the publication assigns the arrowhead.
    - NA=Neo-Assyrian, NB=Neo-Babylonian, UR = Urartian
- **Mat** – the material from which the arrowhead is made
    - fe = iron
    - bz = bronze, including all copper alloys
    - cu = copper (for those known to be unalloyed copper)
    - os = bone
- **Ln.** – total length of the arrowhead, as preserved.
- **Bld.** – the total length of the blade of the arrowhead, as preserved. When a significant portion of the blade length is missing, an asterisk is appended to the given value.
- **Wd.** – the width of the arrowhead at its widest point, as preserved. When a significant portion of the blade width is missing, an asterisk is appended to the given value. A significant portion is defined as an amount noticeably greater than could be accounted for by the corrosion of the arrowhead, thus indicating that it was broken at some point.
- **Wgt.** – the weight of the arrowhead (in grams); not available for most arrowheads.
- **Context** – the type of archaeological context in which the arrowhead was found (often not explicitly identifiable). These include:
    - destr. = destruction level
    - burial = tomb or other burial
    - cache = a group of arrowheads deposited together, perhaps as arrows in a quiver or kept together in a container)

I have included a separate measurement for the length of the blade of arrowheads. The blade of an arrowhead is, naturally, its principle component. The length of tangs and stems can vary, and is not directly linked to the size of the blade. In general, longer blades have longer tangs, but there is a great deal of variation. Furthermore, since many of the arrowheads are at best indifferently preserved, it is often not possible to be sure if the full length of the tang is preserved, or if some amount is broken off. It is far easier to tell if a portion of a blade has broken off, as they will no longer curve to a point. Therefore, a comparison of the size of arrowhead blades

Identifying the bottom of the blade is not always straightforward, as in many simpler arrowhead forms, the blade will merge into the tang. For my measurements, I have chosen the mid-point of the concave curve where the convexity of the blade ends and the straight tang begins. This point is admittedly very difficult to identify with any precision in some cases.

The context of finds is a thorny issue, as it can be somewhat arbitrary. Needless to say, where an arrowhead was deposited can say something about its use and function, and furthermore, its presence can help tune interpretations of the locations in which it was found (arrowheads in a tomb, for example, suggest the individual interred there was a soldier). However, many publications do not specifically state the circumstances of the specific finds, and when they do, they are often vague. An arrowhead found in a street could, for example, date to an attack on the city in question, or it could have been deposited in completely peaceful circumstances, such as accidental loss. In the end, there were only three archaeological contexts that were specific enough to be isolated: those found in destruction levels (which also generally greatly aids in dating them), those found in burials, and thought found together in what are clearly intentional groupings. The last category, which I have labeled "caches" after the term used by Tufnell,[1] could indicate arrowheads that were being stored, however these close groupings could also represent the remains of arrows that filled a quiver made of perishable material, now rotted away. Thus even this context is rather more ambiguous than one might hope.

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Assur	1	3a-2	NA?	bz	4.1	3.7	1.4		burial	39
Assur	2	5v-1	NA	bz	7.2	5.2	1.6		burial	214
Assur	3	5q-3	NA	bz	4.4	2.1	1.3		burial	207
Assur	4	1c-1	NA	bz	3.6	1.7	0.3		burial	20
Assur	5	3a-2	?	bz	3.6	2.8	1.1			38
Assur	6	3a-2	?	bz	4.2	3.4	1.0			38
Assur	7	3a-2?	?	bz	4.7	4.4	1.2			40
Assur	8	3a-2	?	bz	4.4	3.8	1.1			39
Assur	9	2-2	?	bz	3.1	2.4	1.1			28
Assur	10	3a-2	?	bz	5.6	4.4	1.1			40
Assur	11	2-2	?	bz	3.1	2.4	1.0			28
Assur	12	3a-2	?	bz	4.9	3.6	1.1			39
Assur	13	3a-2	?	bz	5.2	4.8	1.1			40
Assur	14	3a-2	?	bz	2.9	1.9	0.9			37
Assur	15	3a-2	?	bz	3.3	2.4	1.1			37
Assur	16	3a-2	?	bz	3.4	2.5	1.0			38
Assur	17	3a-2	?	bz	3.7	2.4	0.9			37
Assur	18	3a-2	?	bz	2.8	1.9	0.8			37
Assur	19	3a-2	?	bz	5.1	3.8	0.9			39
Assur	20	3a-2	?	bz	3.5	2.2	0.8			37
Assur	21	3a-3	?	bz	6.1	4.7	1.1			42
Assur	22	3a-3	?	bz	3.4	2.5	0.9			41
Assur	23	3a-3	?	bz	4.2	2.5	0.9			41

[1] Tufnell 1953, pp. 106

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Assur	24	3a-3	?	bz	4.8	3.1	0.9			41
Assur	25	3a-2	?	bz	3.3	2.9	0.9			38
Assur	26	3c-2	?	bz	2.6	1.3	0.7			46
Assur	27	3a-3	?	bz	3.4	2.4	1.0			41
Assur	28	3a-3	?	bz	3.5	2.7	0.9			41
Assur	29	2-3	?	bz	3.2	2.1	1.0			30
Assur	30	2-3	?	bz	4.9	3.1	1.2			31
Assur	31	3a-3	?	bz	4.6	2.9	1.3			41
Assur	32	3a-3	?	bz	4.9	3.2	1.2			41
Assur	33	3a-1	?	bz	3.5	3.0	1.0*			37
Assur	34	3a-2	?	bz	4.0	2.7	1.1			38
Assur	35	3a-2	?	bz	4.2	3.0	1.2			38
Assur	36	3a-2	?	bz	4.0	3.0	1.0			38
Assur	37	3a-2	?	bz	5.4	4.2	1.1			40
Assur	38	2-2	?	bz	3.6	2.4	1.0			28
Assur	39	3a-2	?	bz	4.0	3.2	0.9			38
Assur	40	3a-3!	?	bz	2.3	1.4	0.8			41
Assur	41	3a-8	?	bz	3.9	2.9	1.0			43
Assur	42	3a-1	?	bz	4.2	4.2	1.3*			37
Assur	43	3a-1?	?	bz	2.9	2.5	1.3			37
Assur	44	3a-14?	?	bz	5.6	4.3	1.3			44
Assur	45	3a-2	?	bz	2.2	1.7	0.5			37
Assur	46	3a-2	NA?		2.3	1.8	0.5			37
Assur	47	2-3	NA?	bz	3.0	2.0	1.0			30
Assur	48	3a-7	?	bz	3.9	2.8	1.2			43
Assur	49	3a-3	614	bz	4.1	3.0	0.9		destr.	41
Assur	50	1c-1	NA?	bz	3.3	1.0	0.4			20
Assur	51	1c-1	NA?	bz	2.9	1.3	0.3			20
Assur	52	3a-3	?	bz	3.5	2.2	0.9			41
Assur	53	3a-11	?	bz	2.6	2.0	1.1			44
Assur	54	5q-22	?	bz	4.4	3.4	1.9			211
Assur	55	5q-22	?	bz	5.2	2.2	1.9			211
Assur	56	5r-4	?	bz	4.8	3.6	1.7			212
Assur	57	5q-22	?	bz	8.6	3.5	1.7			211
Assur	58	5y-22	?	fe	5.7	2.3	1.4			216
Assur	59	5e-20	?	bz	3.8	2.5	1.2			186
Assur	60	5e-20	?	bz	4.1	2.5	1.7			186
Ayanis	1	1c-2	ca. 650-590	fe	6.8	3.0	0.8		destr.	23
Ayanis	2	1a-1	ca. 650-590	fe	4.6	3.4	1.3		destr.	12
Ayanis	3	1a-2	ca. 650-590	fe	6.2	3.3	1.1		destr.	15
Ayanis	4	1a-1	ca. 650-590	fe	6.6	3.3	1.3		destr.	12
Ayanis	5	5a-1	ca. 650-590	fe	3.7	2.7	1.1		destr.	49
Ayanis	6	5a-1	ca. 650-590	fe	4.9	3.5	1.1		destr.	57
Ayanis	7	5a-1	ca. 650-590	fe	3.6	3.4	1.1		destr.	56
Ayanis	8	5a-1	ca. 650-590	fe	4.3	3.0	1.2		destr.	52
Ayanis	9	5a-1	ca. 650-590	fe	5.4	3.7	1.6		destr.	59
Ayanis	10	5a-1	ca. 650-590	fe	6.6	3.7	1.3		destr.	60
Ayanis	11	5a-4	ca. 650-590	fe	6.2	4.0	1.3		destr.	109
Ayanis	12	5a-1	ca. 650-590	fe	6.2	4.0	1.4		destr.	62
Ayanis	13	5a-1	ca. 650-590	fe	8.2	4.2	1.4		destr.	63
Ayanis	14	5a-1	ca. 650-590	fe	6.2	4.5	1.6		destr.	66
Ayanis	15	5a-1	ca. 650-590	fe	5.5	3.0	1.6		destr.	53
Ayanis	16	5b-1?	ca. 650-590	fe	4.7	3.5	1.2		destr.	175
Ayanis	17	5a-1	ca. 650-590	fe	5.6	4.5	1.7		destr.	66
Ayanis	18	5a-1	ca. 650-590	fe	6.1	5.0	1.5		destr.	73
Ayanis	19	5a-1	ca. 650-590	fe	6.3	4.3	1.7		destr.	64
Ayanis	20	5a-1	ca. 650-590	fe	6.3	4.0	1.5		destr.	62

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Ayanis	21	5a-1	ca. 650-590	fe	6.8	4.0	1.8		destr.	62
Ayanis	22	5a-1	ca. 650-590	fe	5.4	5.0	1.5		destr.	73
Ayanis	23	5a-1	ca. 650-590	fe	7.6	5.0	1.6		destr.	74
Ayanis	24	5c-1	ca. 650-590	fe	8.6	5.4	1.7		destr.	184
Ayanis	25	5c-1	ca. 650-590	fe	9.2	5.3	1.9		destr.	184
Ayanis	26	5b-1	ca. 650-590	fe	9.6	5.5	1.8		destr.	149
Ayanis	27	5b-1	ca. 650-590	fe	8.6	5.6	1.7		destr.	151
Ayanis	28	5b-10?	ca. 650-590	fe	10.0	4.5	1.9		destr.	182
Ayanis	29	5b-1	ca. 650-590	fe	13.1	7.2	2.0		destr.	168
Ayanis	30	5b-1	ca. 650-590	fe	7.5	5.0	1.8		destr.	134
Ayanis	31	5b-1	ca. 650-590	fe	9.0	5.5	1.8		destr.	149
Ayanis	32	5c-1	ca. 650-590	fe	7.5	3.8	1.8		destr.	184
Ayanis	33	5c-1	ca. 650-590	fe	7.0	3.8	1.8		destr.	184
Ayanis	34	5a-1	ca. 650-590	fe	10.3	6.0	1.8		destr.	81
Ayanis	35	5a-1	ca. 650-590	fe	8.7	4.7	1.8		destr.	71
Ayanis	36	5a-1	ca. 650-590	fe	4.8	3.0*	1.6		destr.	93
Ayanis	37	5a-1	ca. 650-590	fe	4.8	2.5	1.7		destr.	48
Ayanis	38	5a-1	ca. 650-590	fe	7.1	4.9	1.8		destr.	72
Ayanis	39	5c-1	ca. 650-590	fe	9.6	5.5	1.6		destr.	184
Ayanis	40	5b-1	ca. 650-590	fe	10.0	5.7	1.8		destr.	153
Ayanis	41	5b-1	ca. 650-590	fe	8.5	5.0	1.5		destr.	135
Ayanis	42	5b-1	ca. 650-590	fe	8.5	5.0	2.0		destr.	136
Ayanis	43	5b-1	ca. 650-590	fe	6.3	5.0	2.0		destr.	133
Ayanis	44	5b-1	ca. 650-590	fe	10.8	6.0	2.0		destr.	157
Ayanis	45	5b-1	ca. 650-590	fe	12.2	6.2	2.1		destr.	160
Ayanis	46	5b-1	ca. 650-590	fe	8.0	5.0	2.2		destr.	135
Ayanis	47	5b-1	ca. 650-590	fe	8.0	5.5	2.0		destr.	148
Ayanis	48	5b-1	ca. 650-590	fe	7.6	5.5	2.0		destr.	147
Ayanis	49	5b-1	ca. 650-590	fe	9.4	5.8	2.2		destr.	155
Ayanis	50	5b-1	ca. 650-590	fe	9.9	5.3	2.3		destr.	145
Ayanis	51	5b-1	ca. 650-590	fe	8.7	6.5	2.1		destr.	162
Ayanis	52	5b-1	ca. 650-590	fe	10.7	6.0	1.9		destr.	157
Ayanis	53	5b-1	ca. 650-590	fe	10.1	6.0	2.0		destr.	157
Ayanis	54	5b-1	ca. 650-590	fe	10.4	6.2	2.0		destr.	159
Ayanis	55	5b-1	ca. 650-590	fe	10.5	5.7	2.0		destr.	154
Ayanis	56	5b-1	ca. 650-590	fe	9.6	5.6	2.0		destr.	151
Ayanis	57	5b-1	ca. 650-590	fe	7.8	5.5	2.0		destr.	148
Ayanis	58	5b-1	ca. 650-590	fe	8.2	5.5	2.0		destr.	148
Ayanis	59	5b-1	ca. 650-590	fe	8.5	5.6	2.0		destr.	150
Ayanis	60	5b-1	ca. 650-590	fe	8.7	6.5	2.2		destr.	162
Ayanis	61	5b-1	ca. 650-590	fe	8.4	5.7	2.1		destr.	153
Ayanis	62	5b-1	ca. 650-590	fe	9.0	6.5	2.5		destr.	163
Ayanis	63	5b-1	ca. 650-590	fe	12.0	6.8	2.2		destr.	166
Ayanis	64	5b-1	ca. 650-590	fe	13.8	6.5	2.0		destr.	164
Ayanis	65	5b-1	ca. 650-590	fe	9.8	7.0	2.0		destr.	168
Ayanis	66	5b-1	ca. 650-590	fe	10.9	6.3	2.3		destr.	161
Ayanis	67	5b-1	ca. 650-590	fe	9.8	6.7	2.4		destr.	165
Ayanis	68	5b-1!	ca. 650-590	fe	8.3	3.3	1.7		destr.	114
Ayanis	69	5b-14	ca. 650-590	fe	16.2	7.8	2.0		destr.	182
Ayanis	70	5b-5?	ca. 650-590	fe	8.7	4.4	2.2		destr.	181
Ayanis	71	2-3	ca. 650-590	bz	5.0	4.1	1.4		destr.	34
Ayanis	72	2-3	ca. 650-590	bz	5.7	4.0	1.4		destr.	34
Ayanis	73	2-6	ca. 650-590	bz	5.9	4.0	1.5		destr.	35
Ayanis	74	2-3	ca. 650-590	bz	4.8	4.2	1.4		destr.	34
Ayanis	75	2-3	ca. 650-590	bz	4.7	3.7	1.4		destr.	33
Ayanis	76	2-3	ca. 650-590	bz	4.8	3.8	1.4		destr.	33
Ayanis	77	2-3	ca. 650-590	bz	5.2	3.9	1.3		destr.	34

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Ayanis	78	2-3	ca. 650-590	bz	5.1	3.8	1.2		destr.	34
Ayanis	79	2-3	ca. 650-590	bz	4.7	3.5	1.3		destr.	32
Ayanis	80	2-3	ca. 650-590	bz	4.8	3.4	1.3		destr.	32
Ayanis	81	2-3	ca. 650-590	bz	4.6	2.7	1.2		destr.	31
Ayanis	82	2-3	ca. 650-590	bz	4.1	3.0	1.1		destr.	31
Ayanis	83	2-3	ca. 650-590	bz	4.0	2.7	1.3		destr.	31
Ayanis	84	2-3	ca. 650-590	bz	5.1	3.4	1.3		destr.	32
Ayanis	85	2-3	ca. 650-590	bz	4.5	3.2	1.1		destr.	32
Ayanis	86	2-3	ca. 650-590	bz	4.2	3.3	0.8		destr.	32
Ayanis	87	2-3	ca. 650-590	bz	3.2	2.0*	1.1		destr.	34
Ayanis	88	5z-14	ca. 650-590	bz	9.0	8.0	2.0		destr.	217
Ayanis	89	5z-14	ca. 650-590	bz	11.5	8.7	1.9		destr.	217
Ayanis	90	5d-14	ca. 650-590	bz	15.2	8.6	1.8		destr.	185
Ayanis	91	2-1	ca. 650-590	bz	4.2	4.0	1.3		destr.	27
Ayanis	92	2-1	ca. 650-590	bz	4.2	3.8	1.3		destr.	26
Ayanis	93	2-1	ca. 650-590	bz	4.6	3.8	1.3		destr.	26
Ayanis	94	2-1	ca. 650-590	bz	4.6	4.0	1.4		destr.	27
Ayanis	95	2-1	ca. 650-590	bz	4.7	4.7	1.4		destr.	27
Ayanis	96	2-1	ca. 650-590	bz	4.4	4.1	1.3		destr.	27
Ayanis	97	2-1	ca. 650-590	bz	4.4	4.4*	1.4		destr.	27
Ayanis	98	2-1	ca. 650-590	bz	4.4	3.7	1.3		destr.	26
Ayanis	99	2-1	ca. 650-590	bz	4.3	3.6	1.3		destr.	26
Ayanis	100	2-1	ca. 650-590	bz	4.4	3.7	1.6		destr.	26
Ayanis	101	2-1	ca. 650-590	bz	4.3	4.3	1.2		destr.	27
Ayanis	102	2-1	ca. 650-590	bz	4.2	3.9	1.3		destr.	26
Ayanis	103	2-1	ca. 650-590	bz	4.2	4.1	2.0		destr.	27
Ayanis	104	2-2	ca. 650-590	bz	4.3	3.0*	1.2		destr.	30
Ayanis	105	2-7	ca. 650-590	bz	3.7	3.3	1.1		destr.	35
Ayanis	106	2-1	ca. 650-590	bz	3.9	3.6	1.4		destr.	26
Ayanis	107	3a-11	ca. 650-590	bz	3.5	2.3	1.2		destr.	44
Ayanis	108	1c-2	ca. 650-590	bz	6.8	3.1	0.9		destr.	24
Bastam	1	5b-1	UR	fe	8.3	3.2*	1.8			171
Bastam	2	2-3	UR	bz	5.6	3.5	1.5			33
Bastam	3	2-2	UR	bz	3.2	2.9	1.0			28
Bastam	4	5a-3	UR	bz	4.6	1.6	1.3			107
Bastam	5	5b-1	UR	fe	4.9	3.1*	1.4			171
Bastam	6	5a-1?	ca. 650	fe	4.4	3.9	1.6		destr.	98
Bastam	7	5b-1	ca. 650	fe	10.6	6.2	2.0		destr.	159
Bastam	8	2-2	ca. 650	bz	3.4	2.8	0.9			28
Bastam	9	5a-1?	UR	fe	6.5	4.5	1.4*			99
Bastam	10	3a-5	UR	bz	3.4	2.4	1.1			42
Bastam	11	5f-1	UR	fe	8.8	5.5	1.5			187
Bastam	12	5a-1?	UR	fe	4.0	3.0*	2.2*			101
Bastam	13	5b-1	UR	fe	8.0	4.2*	1.8			172
Bastam	14	2-2	ca. 650	bz	4.7	4.1	1.3		destr.	29
Bastam	15	2-2	ca. 650	bz	3.2	2.6*	1.1		destr.	30
Bastam	16	2-1	ca. 650	bz	4.2	3.9	1.4		destr.	27
Bastam	17	5a-1?	ca. 650	fe	4.0	3.9	1.6		destr.	98
Bastam	18	2-2	ca. 650	bz	5.1	3.7	0.9		destr.	29
Bastam	19	2-3	ca. 650	bz	3.9	3.2	0.6		destr.	31
Bastam	20	5b-1	UR	fe	4.3	3.6	1.5			116
Bastam	21	5y-3	UR	fe	9.8	4.2	1.7			216
Bastam	22	2-1	UR	bz	3.9	3.6	1.2			26
Bastam	23	2-2	UR	bz	3.5	2.7	1.1			28
Carchemish	1	3a-3	late 7th C	bz	4.5	3.9	1.1	4.5	destr.	42
Carchemish	2	3a-3	late 7th C	bz	4.5	3.9	1.1	4.5	destr.	42
Carchemish	3	2-3	late 7th C	bz	5.1	3.6	1.1	4.5	destr.	33

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Carchemish	4	2-3	late 7th C	bz	5.1	3.6	1.1	4.5	destr.	33
Carchemish	5	2-3	late 7th C	bz	5.0	3.0	1.0	5.5	destr.	31
Carchemish	6	4-18	late 7th C	bz	4.7	2.4	1.2	6.0	destr.	46
Carchemish	7	4-18	late 7th C	bz	4.8	2.5	1.3	7.0	destr.	46
Carchemish	8	2-3	late 7th C	bz	4.9	2.9	1.0	4.5	destr.	31
Carchemish	9	4-17	late 7th C	bz	4.3	2.4	1.0	5.0	destr.	46
Carchemish	10	4-17	late 7th C	bz	5.1	2.2	1.0	6.5	destr.	46
Carchemish	11	4-18	late 7th C	bz	5.0	2.1	0.9	6.5	destr.	46
Carchemish	12	3a-14	late 7th C	bz	3.0	2.1	1.1	3.0	destr.	44
Carchemish	13	3a-14	late 7th C	bz	3.0	2.1	1.1	3.0	destr.	44
Carchemish	14	3a-14	late 7th C	bz	3.0	2.1	1.1	2.5	destr.	44
Carchemish	15	2-2	late 7th C	bz	4.5	3.7	1.5	5.5	destr.	28
Carchemish	16	2-9	late 7th C	bz	3.1	2.1	1.1	3.5	destr.	36
Carchemish	17	3a-2	late 7th C	bz	4.0	3.0	1.0	4.0	destr.	38
Carchemish	18	3a-2	late 7th C	bz	4.1	3.1	1.0	5.0	destr.	38
Carchemish	19	3a-2	late 7th C	bz	4.1	3.0	1.0	4.5	destr.	38
Carchemish	20	5r-1	late 7th C	fe	9.6	5.1	2.0	15.0	destr.	212
Carchemish	21	5q-1	late 7th C	fe	5.6	3.0	1.5	6.0	destr.	204
Carchemish	22	5a-1	late 7th C	fe	6.1	3.4*	1.8	7.5	destr.	94
Carchemish	23	5a-1	late 7th C	fe	4.7	3.7	1.3	4.0	destr.	59
Carchemish	24	5p-1?	late 7th C	fe	3.1	2.2	1.3	2.0	destr.	195
Carchemish	25	5e-20	late 7th C	fe	6.0	3.2	1.1	7.5	destr.	186
Carchemish	26	5e-20	late 7th C	fe	5.3	2.8	1.1	5.0	destr.	186
Carchemish	27	5a-1?	late 7th C	fe	5.0	3.2	1.4	5.0	destr.	98
Carchemish	28	5b-37?	late 7th C	fe	5.6	3.8	1.5	6.0	destr.	183
Carchemish	29	5q-1	late 7th C	fe	5.6	3.7	1.4	6.0	destr.	204
Carchemish	30	5b-1	late 7th C	fe	6.8	3.4	1.8	9.0	destr.	115
Carchemish	31	5p-41	late 7th C	fe	9.9	8.4	2.0		destr.	204
Carchemish	32	5b-1?	late 7th C	fe	8.1	7.1	2.6		destr.	179
Carchemish	33	5q-1	late 7th C	fe	9.5	7.3	2.7		destr.	206
Carchemish	34	5b-1?	late 7th C	fe	7.1	5.8	2.2		destr.	178
Carchemish	35	5p-41	late 7th C	fe	9.3	7.7	1.9		destr.	204
Carchemish	36	5a-3?	late 7th C	fe	7.1	6.0*	3.3		destr.	108
Carchemish	37	5p-39	late 7th C	fe	11.5	9.3	2.2		destr.	203
Carchemish	38	5p-1	late 7th-early 6th C	bz	?	?	?		destr.	195
Carchemish	39	5f-1	late 7th-early 6th C	bz	?	?	?		destr.	188
Carchemish	40	5a-1	late 7th-early 6th C	fe	?	?	?		destr.	87
Carchemish	41	5p-39	late 7th-early 6th C	fe	?	?	?		destr.	203
Carchemish	42	5p-5	late 7th-early 6th C	fe	?	?	?		destr.	198
Carchemish	43	5p-5	late 7th-early 6th C	fe	?	?	?		destr.	198
Fakhariya	1	5a-28	NA	bz	11.3	8.4	2.4		burial	112
Fakhariya	2	5a-28	NA	bz	8.2	7.2	2.3		burial	112
Fakhariya	3	5a-28	NA	bz	10.1	6.0			burial	112
Fakhariya	4	5a-28	NA	bz	10.6	6.7	2.1		burial	112
Fakhariya	5	5a-28	NA	bz	8.2	6.9	2.0		burial	112
Fakhariya	6	5v-28	NA	bz	9.8	5.4	1.8		burial	215
Fakhariya	7	5u-28	NA	bz	9.6	5.6	1.6		burial	214
Fakhariya	8	5v-28	NA	bz	9.1	5.4	1.6		burial	215
Fakhariya	9	5v-28	NA	bz	8.9	5.5	1.8		burial	215
Fakhariya	10	5b-1?	NA	bz	6.8	4.5	1.6		burial	177
Fakhariya	11	5v-28!	NA	bz	6.5	3.5	1.5		burial	215
Fakhariya	12	5b-5	NA	bz	7.5	4.1	1.7		burial	181
Fakhariya	13	5a-5	Iron Age	bz	6.8	2.7	1.5			110
Fakhariya	14	5p-2	Iron Age	bz	8.9	7.2	1.8			196
Fakhariya	15	5a-1!	Iron Age	bz	7.9	4.5	1.4			68
Gerar	1	1a-2	?	bz	6.0	3.3	0.7			15
Gerar	2	5p-1	?	bz	8.5	4.6	1.3			192

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Gerar	3	5a-1	?	bz	3.3	1.8*	1.1			88
Gerar	4	5p-1	?	bz	7.3	4.9	1.3			192
Gerar	5	2-2	?	bz	3.2	2.0	1.0			28
Gerar	6	5b-1	?	fe	11.7	6.6*	2.2			175
Gerar	7	5a-1	?	fe	12.4	6.5	2.0			83
Gerar	8	1c-1	?	fe	5.9	4.0	0.9			21
Gerar	9	1c-2	?	fe	8.3	6.0	1.0			24
Gerar	10	1c-2	?	fe	6.8	4.9	1.2			24
Gerar	11	1c-1	?	fe	7.2	5.0	0.7			21
Gerar	12	1c-1	?	fe	5.6	3.3	0.8			20
Gerar	13	1c-2	?	fe	7.1	5.0	1.2			24
Gerar	14	1c-1?	?	fe	5.5	5.0*	1.3			23
Gerar	15	1c-2	?	fe	8.4	4.4	1.4			24
Gerar	16	2-5	?	bz	3.7	2.7*	1.1			35
Gerar	17	2-3	?	bz	5.2	3.3	1.0			32
Gerar	18	2-3	?	bz	5.1	3.2	1.3			32
Gerar	19	2-3	?	bz	4.7	3.3	1.2			32
Gerar	20	2-3	?	bz	4.0	2.6	0.9			30
Gerar	21	2-14	?	bz	3.7	2.9	1.3			36
Gerar	22	2-11	?	bz	3.5	2.5	1.2			36
Gerar	23	2-5	?	bz	4.8	3.4	1.5			35
Gerar	24	2-6	?	bz	4.1	2.1	1.4			35
Gerar	25	2-3	?	bz	3.3	2.3	0.9			30
Gerar	26	2-1?	?	bz	3.3	3.3	0.8			27
Gerar	27	3a-1	?	bz	3.8	3.8	1.4			37
Gerar	28	3b-16	?	fe	3.9	3.3	1.5			46
Gerar	29	3a-7	?	bz	3.4	3.4	1.3			43
Gerar	30	3a-4	?	bz	5.0	5.0	1.0			42
Gerar	31	3a-2	?	bz	4.5	3.7	0.9			39
Gerar	32	3a-2	?	bz	3.7	2.9	0.8			38
Gerar	33	3a-2?	?	bz	4.2	3.2	1.0			40
Gerar	34	3a-2	?	bz	4.6	4.0	1.3			40
Gerar	35	3a-3	?	bz	4.2	3.3	1.1			42
Gerar	36	3b-1	?	bz	2.8	2.8	1.1			45
Gerar	37	3b-4	?	bz	3.1	3.1	1.3			45
Gerar	38	5a-1	?	fe	4.3	3.0	1.3			52
Gerar	39	5a-1	?	fe	10.1	6.4?	1.5			97
Gerar	40	5a-1	?	fe	9.0	6.7	1.4			84
Gerar	41	5a-1	?	fe	9.0	6.8	1.3			84
Gerar	42	5a-1	?	fe	6.8	3.8*	1.3			95
Gerar	43	5a-1	?	fe	4.4	2.7*	1.1			91
Gerar	44	5a-1?	?	bz	8.4	8.4*	1.9			102
Gerar	45	5a-1	?	fe	7.3	5.3	1.2			76
Gerar	46	5a-1	?	fe	7.7	6.2	1.8			82
Gerar	47	5a-1	?	fe	6.8	5.8	1.7			79
Gerar	48	5a-1	?	fe	5.9	5.0	1.8			73
Gerar	49	5a-1	?	fe	5.8	4.9	1.5			72
Gerar	50	5a-1	?	fe	4.9	4.9*	1.6			97
Gerar	51	5p-1	?	fe	5.8	4.4	1.6			192
Gerar	52	5a-1	?	fe	6.7	4.3	1.7			65
Gerar	53	5a-1	?	fe	9.6	6.9	1.0			85
Gerar	54	5a-3	?	fe	8.4	7.1	2.3			107
Gerar	55	5a-1	?	fe	4.7	2.9	1.4			51
Gerar	56	5a-1	?	fe	6.9	4.7*	1.4			97
Gerar	57	5a-2	?	fe	7.9	7.3	1.4			104
Gerar	58	5a-1	?	fe	8.7	7.3?	4.4			98
Gerar	59	5a-1	?	fe	3.7	3.7*	1.1			95

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Gerar	60	5a-1	?	fe	3.4	2.6	1.2			49
Gerar	61	5a-2	?	fe	4.9	4.0	1.7			102
Gerar	62	5a-1	?	fe	8.6	5.3	1.2			77
Gerar	63	5a-1	?	fe	8.0	5.2	1.1			76
Gerar	64	5a-1	?	fe	7.9	3.6	1.1			59
Gerar	65	5p-1	?	fe	5.0	4.0	1.4			192
Gerar	66	5p-4	?	fe	6.0	5.4	1.7			197
Gerar	67	5q-1!	?	fe	6.4	6.2	2.0			206
Gerar	68	5b-1!	?	fe	7.7	6.0*	1.9			174
Gerar	69	1a-8	?	fe	3.8	3.3	1.0			20
Gerar	70	5a-1	?	fe	6.1	5.0*	2.3			97
Gerar	71	5a-1?	?	fe	7.5	7.3	1.5			101
Gerar	72	5p-1?	?	fe	7.1	7.1*	2.2			195
Gerar	73	5a-1	?	fe	6.2	5.7*	1.9			97
Gerar	74	5a-14?	?	fe	7.8	6.4*	1.9			111
Gerar	75	5b-21!	?	fe	8.3	5.1	1.4			182
Gerar	76	5p-4	?	fe	6.9	6.1	1.5			197
Gerar	77	5p-1?	?	fe	8.5	8.5*	2.2			195
Gerar	78	1a-4	?	fe	9.9	7.4	1.4			18
Gerar	79	1a-4?	?	fe	8.3	6.3	1.3			18
Gerar	80	5a-41	?	fe	8.5	8.1*	3.9			113
Gerar	81	5a-1	?	fe	8.0	5.2	1.6			76
Gerar	82	5b-1	?	fe	5.5	3.2	1.4			114
Gerar	83	5a-1	?	fe	6.9	5.5	1.5			78
Gerar	84	5a-14	?	fe	5.1	4.4*	1.6			111
Gerar	85	5b-1	?	fe	7.3	4.3	1.5			122
Gerar	86	1a-1	?	fe	8.8	6.1	0.8			12
Gerar	87	1a-1	?	fe	6.2	5.1	0.5			12
Gerar	88	1a-2	?	fe	11.5	9.4	0.8			17
Gerar	89	1a-1?	?	fe	5.7	4.8?	0.9			14
Gerar	90	1a-1?	?	fe	7.4	7.4*	0.8			14
Gerar	91	1a-1	?	fe	13.8	11.1	0.8			13
Gerar	92	1a-1?	?	fe	11.3	9.9	1.0			14
Hasanlu	1	5a-2	8th C	fe	10.6	8.2	2.0		destr.	106
Hasanlu	2	5a-2	8th C	fe	9.7	8.2	2.2		destr.	106
Hasanlu	3	5a-2	8th C	fe	9.5	8.2	2.0		destr.	105
Hasanlu	4	5a-1	8th C	fe	9.9	7.3	1.8		destr.	85
Hasanlu	5	5a-2	8th C	fe	8.2	7.3	2.2		destr.	104
Hasanlu	6	5a-2	8th C	fe	7.2	6.0	1.9		destr.	104
Hasanlu	7	5a-2	8th C	fe	6.0	5.3	2.2		destr.	103
Hasanlu	8	5a-2	8th C	fe	7.5	5.0	1.9		destr.	103
Hasanlu	9	5a-19	8th C	fe	8.2	5.4	1.6		destr.	111
Hasanlu	10	5a-2	8th C	fe	7.8	4.2	2.4		destr.	102
Hasanlu	11	5a-1	8th C	fe	5.1	2.7	1.2		destr.	50
Hasanlu	12	5a-1	8th C	fe	6.3	4.0	1.8		destr.	62
Hasanlu	13	5f-1	8th C	fe	4.7	4.2	1.1		destr.	187
Hasanlu	14	5b-19	8th C	fe	6.3	4.8	1.4		destr.	182
Hasanlu	15	5a-3?	8th C	fe	5.2	4.3	1.5		destr.	108
Hasanlu	16	5a-1	8th C	fe	5.9	4.3	1.4		destr.	64
Hasanlu	17	5a-4	8th C	fe	6.2	4.4	1.2		destr.	109
Hasanlu	18	5e-1	8th C	fe	11.1	6.5	1.7		destr.	185
Hasanlu	19	5b-1	8th C	fe	9.4	6.0	1.9		destr.	157
Hasanlu	20	5b-1	8th C	fe	8.0	5.3	1.9		destr.	143
Hasanlu	21	5b-1	8th C	fe	10.1	4.6	1.5		destr.	127
Hasanlu	22	5q-1	8th C	fe	7.6	4.0	1.6		destr.	205
Hasanlu	23	5b-1	8th C	fe	8.1	3.9*	1.4		destr.	172
Hasanlu	24	5a-1	8th C	fe	8.0	5.0	1.8		destr.	74

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Hasanlu	25	5b-1	8th C	fe	6.8	4.1	1.7		destr.	119
Hasanlu	26	5b-1	8th C	fe	7.8	5.0	1.6		destr.	135
Hasanlu	27	5a-1	8th C	fe	5.2	2.3*	1.7		destr.	89
Hasanlu	28	5b-1	8th C	fe	7.0	4.2	1.6		destr.	122
Hasanlu	29	5a-1	8th C	fe	6.3	4.7	1.9		destr.	69
Hasanlu	30	5a-1	8th C	fe	5.8	3.2	1.7		destr.	55
Hasanlu	31	5a-1?	8th C	fe	6.6	2.5*	1.6		destr.	101
Hasanlu	32	5b-1	8th C	fe	6.0	3.4	1.2		destr.	115
Hasanlu	33	5a-1?	8th C	fe	4.9	3.8	1.2		destr.	98
Hasanlu	34	5q-1	8th C	fe	3.8	2.7	1.3		destr.	204
Hasanlu	35	2-2!	8th C	fe	9.6	6.8	2.0		destr.	30
Hasanlu	36	2-2!	8th C	fe	10.4	6.6	1.9		destr.	30
Hasanlu	37	2-2!	8th C	fe	8.6	6.3	2.0		destr.	29
Hasanlu	38	2-2!	8th C	fe	7.4	5.8	1.9		destr.	29
Hasanlu	39	2-2	8th C	fe	8.9	5.8	1.7		destr.	29
Hasanlu	40	5a-5	8th C	fe	7.9	5.7	2.2		destr.	110
Hasanlu	41	5b-5	8th C	fe	6.9	4.1	1.8		destr.	181
Hasanlu	42	5a-9?	8th C	fe	4.7	4.7	1.9		destr.	110
Hasanlu	43	5b-5	8th C	fe	9.4	4.2	2.0		destr.	181
Hasanlu	44	5b-6	8th C	fe	8.7	3.8	1.9		destr.	181
Hasanlu	45	5b-6?	8th C	fe	5.8	3.8	2.1		destr.	181
Hasanlu	46	5b-6	8th C	fe	5.0	3.8	1.9		destr.	181
Hasanlu	47	7d	8th C	fe	8.5	6.8	1.6		destr.	218
Hasanlu	48	1a-2	8th C	fe	10.0	5.8	1.0		destr.	16
Hasanlu	49	1a-2	8th C	fe	7.1	4.5	1.0		destr.	15
Hasanlu	50	1a-2	8th C	fe	6.3	4.1	0.7		destr.	15
Hasanlu	51	1c-1	8th C	fe	5.3	3.5	1.0		destr.	21
Hasanlu	52	1c-1?	8th C	fe	5.2	2.8	1.0		destr.	22
Hasanlu	53	1c-2	8th C	fe	3.4	3.0	0.9		destr.	23
Hasanlu	54	5p-5	8th C	bz	10.1	6.7	2.8		destr.	198
Hasanlu	55	5p-1!	8th C	bz	8.1	4.7	1.7		destr.	192
Hasanlu	56	5v-1!	8th C	bz	6.1	2.7*	1.6		destr.	214
Hasanlu	57	5a-1	8th C	bz	7.2	5.5	1.8		destr.	78
Hasanlu	58	5u-1?	8th C	bz	7.6	4.0	1.8		destr.	213
Hasanlu	59	5q-8	8th C	bz	7.7	5.2	2.2		destr.	211
Hasanlu	60	5q-5!	8th C	bz	8.3	5.1	2.2		destr.	209
Hasanlu	61	5q-5	8th C	bz	5.1	4.7	2.0		destr.	209
Hasanlu	62	5r-5	8th C	bz	4.3	3.8	1.9		destr.	212
Hasanlu	63	5q-4	8th C	bz	6.8	3.8	2.0		destr.	208
Hasanlu	64	5a-5	8th C	bz	7.9	4.0	1.7		destr.	110
Hasanlu	65	5q-5	8th C	bz	6.8	3.5	2.0		destr.	209
Hasanlu	66	5a-1	8th C	bz	5.4	3.9	1.4		destr.	60
Hasanlu	67	5a-1	8th C	bz	6.2	3.5*	1.3		destr.	95
Hasanlu	68	1c-1	8th C	bz	6.3	4.7*	0.6		destr.	21
Hasanlu	69	9	8th C	os	6.3	5.1	1.7		destr.	222
Hasanlu	70	9	8th C	os	7.9	5.2	1.7		destr.	222
Hasanlu	71	9	8th C	os	6.6	5.1	1.7		destr.	222
Hasanlu	72	9	8th C	os	4.6	2.6	1.5		destr.	220
Hasanlu	73	9	8th C	os	4.8	3.0	1.5		destr.	220
Hasanlu	74	9	8th C	os	4.0	4.0	1.4		destr.	221
Hasanlu	75	9	8th C	os	4.1	4.1	1.5		destr.	221
Hasanlu	76	9	8th C	os	6.0	3.4	1.3		destr.	220
Hasanlu	77	9	8th C	os	7.2	7.2	0.9		destr.	222
Hasanlu	78	9	8th C	os	6.0	5.8	0.6		destr.	222
Hasanlu	79	9	8th C	os	4.8	4.4	0.8		destr.	221
Hasanlu	80	9	8th C	os	3.9	2.0*	0.6		destr.	223
Hasanlu	81	9	8th C	os	4.5	3.2	1.0		destr.	220

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Hasanlu	82	9	8th C	os	3.0	2.0*	0.7		destr.	223
Hasanlu	83	9	8th C	os	4.8	2.9	0.8		destr.	220
Hasanlu	84	9	8th C	os	3.5	1.7	0.9		destr.	220
Hasanlu	85	2-5	8th-4th C	bz	4.5	3.4	1.5			35
Hasanlu	86	2-14	8th-4th C	bz	3.4	2.6	1.6			36
Hasanlu	87	2-14	8th-4th C	bz	3.2	2.2	1.3			36
Hasanlu	88	3a-3	8th-4th C	bz	3.5	2.0	1.0			41
Hasanlu	89	3b-2	8th-4th C	bz	2.3	1.7	1.1			45
Hasanlu	90	3a-3	8th-4th C	bz	3.5	2.3	1.0			41
Hasanlu	91	3a-19	8th-4th C	bz	5.6	2.8	1.2			45
Hasanlu	92	2-2	8th-4th C	bz	4.7	3.8	1.5			29
Igdyr	1	5b-1	UR	fe	6.5	5.2	1.5		burial	139
Igdyr	2	5b-1	UR	fe	6.7	4.6	1.8		burial	126
Igdyr	3	5b-1	UR	fe	6.5	4.7	1.7		burial	128
Igdyr	4	5b-1	UR	fe	6.4	5.3	1.5		burial	142
Igdyr	5	5b-1	UR	fe	8.4	5.4	1.6		burial	146
Karchaghbyur	1	5p-8	8th-7th C	bz	6.4	2.9	2.3*		burial	199
Karchaghbyur	2	5p-4	8th-7th C	bz	7.6	3.2	1.6		burial	197
Karchaghbyur	3	9	8th-7th C	os	10.1	7.8	1.8		burial	222
Karchaghbyur	4	5g-5	8th-7th C	bz	7.6	3.5	2.0		burial	191
Karchaghbyur	5	5p-7	8th-7th C	bz	8.3	5.6	3.0		burial	198
Karchaghbyur	6	5p-8	8th-7th C	bz	6.8	3.0*	2.3*		burial	199
Karchaghbyur	7	5p-8	8th-7th C	bz	5.5	4.3	3.0		burial	199
Karchaghbyur	8	5p-5	8th-7th C	bz	6.3	4.4	1.9		burial	197
Karchaghbyur	9	3a-2?	8th-7th C	bz	3.2	3.2*	0.8		burial	40
Lachish	1	5a-1	7th C	fe	8.5	7.2	1.5		burial	85
Lachish	2	5a-1	7th C	?	8.6	5.8	1.9		burial	80
Lachish	3	1a-1	7th C	fe	6.8	4.8	1.1		burial	12
Lachish	4	5a-1	7th C	fe	7.1	4.5	1.6		burial	67
Lachish	5	5a-1	7th C	fe	6.6	5.6	1.3		burial	79
Lachish	6	5a-1	7th C	fe	6.7	4.2	1.6		burial	63
Lachish	7	5a-10	7th C	fe	6.5	5.8	1.6		burial	111
Lachish	8	5a-30!	7th C	fe	5.4	2.9	2.0		burial	113
Lachish	9	5a-1	9th-7th C	fe	6.9	5.7	1.4		burial	79
Lachish	10	9	8th C	os	6.4	5.2	1.1			222
Lachish	11	9	8th C	os	7.0	5.5?	0.8			223
Lachish	12	9	8th C	os	4.6	3.5	0.8			220
Lachish	13	5a-1	8th C	fe	6.6	4.3	1.7		destr?	65
Lachish	14	5a-1	8th-7th C	fe	7.4	4.7	1.6		cache	70
Lachish	15	5a-1	8th-7th C	fe	8.3	5.4	1.5		cache	78
Lachish	16	5a-1	8th-7th C	fe	7.3	5.3	2.0	7.4	cache	76
Lachish	17	5b-1	8th-7th C	fe	7.4	5.3	2.0	11.7	cache	143
Lachish	18	5a-1	8th-7th C	fe	5.5	4.2	1.6		cache	63
Lachish	19	5a-1	8th-7th C	fe	4.6	4.0?	1.8		cache	96
Lachish	20	1a-1	8th-7th C	fe	11.8	10.3	1.0	13.2	cache	13
Lachish	21	5b-1?	8th C?	fe	6.6	5.2	1.5		cache	178
Lachish	22	5a-1	7th C	fe	6.6	4.7	1.9		destr	70
Lachish	23	5a-1	7th C	fe	6.7	4.6	1.7		destr	68
Lachish	24	5a-1	7th C	fe	7.0	4.8	1.7	8.1	destr	71
Lachish	25	5q-1	8th-7th C	fe	5.7	3.0*	1.6			207
Lachish	26	5a-1	8th C	fe	5.5	4.3	1.4	4.7		63
Lachish	27	5a-1	8th C?	bz	6.0	5.6	1.9			79
Lachish	28	5a-1	8th C	fe	10.8	8.0	1.6		cache	86
Lachish	29	5a-1	8th C	fe	9.0	5.9	2.2	13.4	cache	81
Lachish	30	5a-1	8th C	fe	7.8	5.4	2.0		cache	78
Lachish	31	5a-1	8th C	fe	6.5	4.5	1.8	6.9	cache	66
Lachish	32	5b-1!	8th C	fe	4.6	2.6	1.7	6.9	cache	114

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Lachish	33	5a-1	8th C	fe	4.2	3.0	1.2	3.0	cache	52
Lachish	34	5a-1	7th C?	fe	6.5	4.4	1.8	8.0		65
Lachish	35	5a-1	8th C	fe	5.5	4.6	1.3			68
Lachish	36	1c-1	8th C	fe	7.0	6.3	0.9	8.0		21
Lachish	37	5b-1	8th C	bz	6.5	3.7	1.0		destr.	117
Lachish	38	5b-1	7th C	fe	9.4	5.3	2.5	18.5	destr.	144
Lachish	39	5b-1	7th C	fe	7.2	5.4	1.9		destr.	145
Lachish	40	5a-1	8th C	fe	6.1	5.2	2.1			75
Lachish	41	5a-1	8th C	fe	6.8	6.8*	1.4			97
Lachish	42	5a-1?	8th C	fe	5.3	4.8	2.0			99
Lachish	43	5a-1	8th C	fe	9.6	6.4	1.8	17.5		82
Lachish	44	5b-1	8th C	fe	9.4	5.3	1.5			144
Lachish	45	5a-1	8th C	fe	6.3	5.3	1.9			76
Lachish	46	5a-1	8th C	fe	6.3	4.8*	1.7			97
Lachish	47	5a-1	8th C	fe	7.5	5.0	1.3			74
Lachish	48	5a-1	8th C	fe	9.7	6.1	2.3	15.4		81
Lachish	49	5a-1	8th C	fe	7.3	6.0?	1.4			97
Lachish	50	5a-1?	8th C	fe	5.4	4.2	1.6			99
Lachish	51	5a-1	8th C	fe	7.5	6.1	1.6			81
Lachish	52	5a-1	8th C	fe	10.4	8.1	1.6			86
Lachish	53	5a-1	8th C	fe	7.5	4.9	2.0	12.4		72
Lachish	54	5a-1	8th C	fe	5.9	4.4	1.7			65
Lachish	55	5a-1	8th C	fe	9.0	6.5	1.9	12.4		82
Lachish	56	5a-1	8th C	fe	6.7	4.0	1.9			62
Lachish	57	5a-1	8th C	fe	5.6	3.7	1.4			59
Lachish	58	5a-1	7th C	fe	5.7	3.4	1.1	3.2		57
Lachish	59	5a-1	7th C	fe	7.3	4.5	1.6	8.8		67
Lachish	60	5a-1	7th C	fe	8.2	5.9	1.3			80
Lachish	61	5a-1	7th C	fe	8.6	7.1	2.3	17.4		85
Lachish	62	1a-1	7th C	fe	12.0	10.0	1.1	13.3		13
Lachish	63	5a-1	7th C	fe	9.0	6.6	1.5			83
Lachish	64	5a-1	7th C	fe	7.6	5.8	1.8			79
Lachish	65	5a-1	10th C	fe	6.6	4.3*	1.9	9.1		96
Lachish	66	5b-1	9th C	fe	10.3	7.2*	1.5	15.2		175
Lachish	67	5b-1?	9th C	fe	8.4	7.3	1.9	11.6		180
Lachish	68	5b-1	9th C	fe	8.3	7.2	1.5	12.9		168
Lachish	69	5?	9th C	fe	4.4	4.4*	1.3			47
Lachish	70	5g-1	8th C	fe	6.9	5.0	1.9	6.7		189
Lachish	71	5g-1?	8th C	fe	6.9	5.3	1.8	6.7		189
Lachish	72	5a-1?	8th C	fe	8.2	6.0	1.4	8.9		100
Lachish	73	1c-1	8th C	fe	5.6	4.3	0.9	4.6		21
Lachish	74	1c-1?	8th C	fe	6.6	5.0	1.1	11.6		22
Lachish	75	1c-1?	7th C	fe	4.9	4.7	1.2	4.3		22
Lachish	76	1c-2	7th C	fe	5.2	4.0	0.9	4.6		24
Lachish	77	1c-2	7th C	fe	6.4	4.6	1.1	7.0		24
Lachish	78	1c-2	7th C	fe	4.6	3.3	0.9	4.0		24
Lachish	79	5b-1	9th C	cu	5.5	3.4	1.4	5.5		115
Lachish	80	5a-1	8th C	cu	6.2	4.3	1.1	4.1		64
Lachish	81	5q-1	9th C	cu	8.5	6.1	1.7	14.4		206
Lachish	82	9	8th C	os	6.2	4.1	0.8	2.2		221
Lachish	83	9	8th C	os	4.4	3.8	1.7	2.0		220
Lachish	84	9	8th C	os	3.6	3.3	1.3	1.0		220
Lachish	85	9	8th C	os	4.4	4.4	1.6	1.8		221
Lachish	86	5b-1	9th C	fe	5.0	3.8*	1.3	5.6		172
Lachish	87	5a-28?	9th C	fe	6.0	3.8*	1.1	5.1		112
Lachish	88	5b-1	9th C	fe	8.0	5.3	1.1	6.0		143
Lachish	89	5b-1	9th C	fe	8.2	6.3	1.5	5.6		160

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Lachish	90	5b-1	9th C	fe	8.0	5.8	1.4	10.8		154
Lachish	91	5b-1	8th C	fe	7.2	3.8*	1.7	4.6		172
Lachish	92	5b-1?	8th C	fe	7.7	6.3	1.5	7.5		179
Lachish	93	5a-1?	8th C	fe	7.2	5.8	1.5	12.0		100
Lachish	94	5b-1	8th C	fe	8.2	4.8*	1.7	7.4		174
Lachish	95	5b-1	8th C	fe	9.6	6.6	1.3	10.3		164
Lachish	96	5b-1?	8th C	fe	5.9	4.5	1.7	5.6		177
Lachish	97	5b-1	8th C	fe	7.0	4.9	1.6	8.2		130
Lachish	98	5b-1	8th C	fe	7.2	4.9	1.9	7.0		131
Lachish	99	5b-1	8th C	fe	8.0	5.7	2.2	11.5		152
Lachish	100	5b-1	8th C	fe	7.7	6.5	1.6	11.0		162
Lachish	101	5b-1	8th C	fe	9.1	6.3	1.7	14.0		161
Lachish	102	5b-1	8th C	fe	7.4	4.9	1.9	8.1		131
Lachish	103	5a-1	8th C	fe	9.4	7.3	1.4	10.6		85
Lachish	104	5b-1	8th C	fe	9.5	7.1	1.5	8.1		168
Lachish	105	5b-1	8th C	fe	8.0	5.6*	1.6	8.4		174
Lachish	106	5b-1	8th C	fe	7.2	4.4*	1.2	5.6		173
Lachish	107	5b-1	7th C?	fe	8.0	7.0	1.5	10.4		166
Lachish	108	5b-1	8th C	fe	8.0	6.1	1.3	8.8		158
Lachish	109	5b-1	9th-8th C	fe	10.6	7.2	1.7	10.8		168
Lachish	110	5b-1	8th C	fe	9.8	7.4	1.7	17.3		169
Lachish	111	5b-1	7th C?	fe	10.2	7.3	1.8	20.7		169
Lachish	112	5b-1	8th C	fe	7.9	5.2	1.5	9.7		141
Lachish	113	5b-1	7th C?	fe	8.5	5.8	1.8	11.3		155
Lachish	114	5b-1	8th C	fe	7.0	5.0	1.7	9.0		134
Lachish	115	5b-1	8th C	fe	7.3	4.5	2.0	9.8		126
Lachish	116	5b-1	8th C	fe	8.7	4.4	1.8	11.2		125
Lachish	117	5q-1	8th C	fe	7.7	4.4*	2.3	16.7		207
Lachish	118	5q-1	8th C	fe	7.3	4.7*	1.9	8.4		207
Lachish	119	5q-1	7th C	fe	6.5	4.4	1.9	10.6		205
Lachish	120	5q-1	9th-8th C	fe	6.2	4.7	1.5	8.3		205
Lachish	121	5a-1	8th C	fe	5.3	3.5	1.9	6.7		58
Lachish	122	5b-1	8th C	fe	7.2	5.3	1.7	10.5		142
Lachish	123	5b-1	8th C?	fe	7.8	5.1	2.0	10.6		138
Lachish	124	5a-1	8th C	fe	6.7	4.6*	1.8	8.4		97
Lachish	125	5a-1	7th C?	fe	7.1	4.1*	1.7	7.7		96
Lachish	126	5b-1	8th C	fe	6.6	4.1	1.7	9.3		119
Lachish	127	5b-1	8th C	fe	6.8	4.3	1.6	8.4		122
Lachish	128	5b-1	8th C	fe	6.5	4.2	1.6			120
Lachish	129	5a-1	8th C	fe	6.1	4.2	1.6	5.1		63
Lachish	130	5a-1	7th C	fe	6.0	3.8	1.6	6.2		60
Lachish	131	5b-1	8th C	fe	7.1	4.9	1.6	5.6		131
Lachish	132	5a-1	8th C	fe	7.4	5.4	1.5	5.5		77
Lachish	133	5b-1	8th C	fe	7.7	5.5	1.5	7.4		148
Lachish	134	5b-1	8th-7th C?	fe	6.8	5.3	1.4	4.1		142
Lachish	135	1a-2	8th-7th C	fe	11.5	9.8	1.2	20.9		17
Lachish	136	1a-1?	8th C	fe	7.0	5.9*	1.0	10.9		14
Lachish	137	1a-1	7th C	fe	6.5	5.4*	1.2	10.1		13
Lachish	138	1c-1	8th C	fe	7.6	6.0*	1.6	19.1		21
Lachish	139	1c-2	8th C	fe	8.8	7.2	1.4	17.2		25
Lachish	140	1c-1	8th C	fe	9.7	9.7*	0.9	8.3		21
Lachish	141	1c-1?	8th C	fe	6.5	6.5*	1.0	8.1		23
Lachish	142	1c-1?	8th C	fe	6.5	6.5*	0.9	3.9		23
Lachish	143	5b-1	7th C	fe	12.2	9.0	1.6	20.1		171
Lachish	144	5b-1	8th C	fe	8.5	6.1	1.7	10.6		158
Lachish	145	5b-1	8th C	fe	8.7	4.6	1.4	10.8		127
Lachish	146	5b-1	8th C	fe	9.8	7.0	1.6	8.4		167

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Lachish	147	5a-1	8th C	fe	9.4	6.4	1.7	9.9		82
Lachish	148	5b-1	8th C	fe	8.3	5.7	1.8	7.4		152
Lachish	149	5q-1	8th C	fe	9.5	5.9	1.6	9.8		206
Lachish	150	5b-1	8th C	fe	8.8	6.5	1.3	8.9		163
Lachish	151	5b-2	8th C	fe	8.8	6.0	1.5	9.0		180
Lachish	152	5b-1	8th C	fe	9.6	6.2	1.7	11.1		159
Lachish	153	5b-1	8th C	fe	9.3	6.5	1.4	9.8		163
Lachish	154	5b-1	8th C	fe	8.4	5.8	1.6	11.5		155
Lachish	155	5b-1	8th C	fe	8.6	5.9	1.7	8.9		156
Lachish	156	5b-1	8th C	fe	8.5	6.8	1.4	12.5		165
Lachish	157	5b-1	8th C	fe	8.3	6.1	1.3	6.0		158
Lachish	158	5b-1	8th C	fe	9.0	6.2	1.3	11.1		159
Lachish	159	5b-1	7th C	fe	9.0	6.9	1.4	6.9		166
Lachish	160	5b-1	8th C	fe	8.8	6.8	1.2	9.5		165
Lachish	161	5b-1	8th C	fe	8.6	5.8	1.4	7.5		155
Lachish	162	5b-1	8th C	fe	9.4	7.9	1.6	16.6		170
Lachish	163	5b-1	8th C	fe	9.0	7.9	1.5	12.9		170
Lachish	164	5b-1?	8th C	fe	7.7	5.0	1.4	7.6		178
Lachish	165	5b-1?	8th C	fe	7.9	6.8	1.4	7.5		179
Lachish	166	5b-1	8th C	fe	8.2	7.0	1.6	9.1		167
Lachish	167	5b-1	8th C	fe	8.0	5.8	1.5	9.8		154
Lachish	168	5b-1	8th C	fe	7.8	5.9	1.6	13.0		156
Lachish	169	5b-1	8th C	fe	7.5	6.2	1.4	6.7		158
Lachish	170	5b-1	8th C	fe	7.4	6.3	1.4	7.3		160
Lachish	171	5b-1	8th C	fe	7.2	5.8	1.2	7.7		154
Lachish	172	5b-1	8th C	fe	8.0	5.6	1.2	6.1		150
Lachish	173	5a-1	8th C	fe	8.4	6.7	1.3	7.5		83
Lachish	174	5b-1	8th C	fe	8.3	5.9	1.2	6.5		156
Lachish	175	5a-1?	8th C	fe	7.1	5.4	1.1	4.4		100
Lachish	176	5a-2	8th C	fe	7.6	4.9	1.4	4.0		102
Lachish	177	1c-1?	8th C	fe	9.9	9.4	1.2	22.1		22
Lachish	178	1c-1?	8th C	fe	7.4	6.4	1.0	11.1		22
Lachish	179	1a-2	8th C	fe	7.2	6.2	0.9	10.1		16
Lachish	180	1a-1	8th C	fe	8.0	6.6	1.0	9.6		12
Lachish	181	1a-1	8th C	fe	5.4	4.6	0.9	5.7		12
Lachish	182	5b-1	8th C	fe	8.2	5.7	1.7	9.7		152
Lachish	183	5b-1	8th C	fe	8.1	5.1	1.7	9.5		139
Lachish	184	5b-1	8th C	fe	7.4	5.0	1.6	8.7		134
Lachish	185	5b-1	8th C	fe	8.6	6.1	1.5	8.9		158
Lachish	186	5b-1	8th C	fe	8.0	5.7	1.7	7.6		152
Lachish	187	5b-1	8th C	fe	7.8	5.4	1.7	10.6		146
Lachish	188	5a-1	8th C	fe	7.2	5.0	1.5	10.6		73
Lachish	189	5a-1	8th C	fe	7.3	5.6	1.6	9.4		79
Lachish	190	5a-1	8th C	fe	7.9	6.0	1.4	6.6		81
Lachish	191	5a-2	8th C	fe	8.5	6.0	1.5	10.1		104
Lachish	192	5b-1	8th C	fe	8.7	6.5	1.5	9.8		162
Lachish	193	5b-1	8th C	fe	8.1	6.3	1.5	11.4		160
Lachish	194	5a-1	8th C	fe	7.2	5.2	1.4	6.2		75
Lachish	195	5a-1	8th C	fe	7.3	5.9	1.3	9.3		80
Lachish	196	5b-1	8th C	fe	7.4	5.5	1.6	9.1		147
Lachish	197	5a-1	8th C	fe	6.5	5.2	1.5	8.8		75
Lachish	198	5a-1	8th C	fe	7.0	5.2	1.5	6.1		75
Lachish	199	5b-1	8th C	fe	6.6	4.8	1.2	4.9		128
Lachish	200	5b-1	8th C	fe	6.9	5.2	1.2	7.2		139
Lachish	201	5b-1	8th C	fe	8.1	7.6	0.7	4.5		169
Lachish	202	5b-1	8th C	fe	6.8	5.2	1.1	3.6		139
Lachish	203	5b-1	8th C	fe	7.4	5.1	1.2	4.5		137

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Lachish	204	5b-1	8th C	fe	6.4	5.0	1.2	4.9		133
Lachish	205	5b-1	8th C	fe	5.5	5.2	1.0	2.8		139
Lachish	206	5a-1?	8th C	fe	5.4	5.0	0.9	3.0		100
Lachish	207	5b-1	8th C	fe	6.1	4.7	1.3	5.3		127
Lachish	208	5b-1	8th C	fe	6.9	5.4	1.3	7.0		145
Lachish	209	5b-1	8th C	fe	6.7	4.8	1.5	8.3		129
Lachish	210	5b-1	8th C	fe	7.0	6.5	1.3	10.2		161
Lachish	211	5b-1	8th C	fe	7.4	5.3	1.3	7.5		143
Lachish	212	5a-1	8th C	fe	6.7	5.4	1.6	7.9		77
Lachish	213	5b-1	8th C	fe	7.3	5.7	1.5	7.1		151
Lachish	214	5b-1	8th C	fe	7.5	5.5	1.3	6.8		147
Lachish	215	5b-1?	8th C	fe	7.4	6.3	1.5	7.2		179
Lachish	216	5a-2	8th C	fe	6.6	5.6	1.6	5.4		103
Lachish	217	5b-1	8th C	fe	7.2	4.9	1.7	11.3		131
Lachish	218	5b-1	8th C	fe	7.5	5.2	1.9	11.9		141
Lachish	219	5b-1	8th C	fe	7.5	4.7*	1.8	10.9		173
Lachish	220	5b-1	8th C	fe	7.3	5.6	1.9	12.4		150
Lachish	221	5b-1	8th C	fe	7.6	6.5	2.0	10.5		162
Lachish	222	5b-1	8th C	fe	7.3	5.6	1.7	7.2		149
Lachish	223	5b-1?	8th C	fe	10.2	5.2	2.2	11.5		178
Lachish	224	5b-1	8th C	fe	8.5	6.4	2.5	9.8		161
Lachish	225	5b-1	8th C	fe	8.0	5.3	2.0	9.6		143
Lachish	226	5b-1	8th C	fe	7.3	5.0	2.0	8.9		134
Lachish	227	5b-1	8th C	fe	7.4	5.2	2.0	12.4		141
Lachish	228	5b-1	8th C	fe	8.4	5.0	1.9	9.0		135
Lachish	229	5b-1	8th C	fe	7.9	5.2	1.8	10.6		142
Lachish	230	5b-1	8th C	fe	7.7	4.5	1.9	8.5		126
Lachish	231	5b-1	8th C	fe	7.3	5.1	1.5	8.1		137
Lachish	232	5b-1	8th C	fe	6.6	4.6	1.6	8.4		126
Lachish	233	5b-1	8th C	fe	7.5	5.0	1.7	8.1		134
Lachish	234	5a-1	8th C	fe	7.4	5.0	1.9	9.6		74
Lachish	235	5a-1	8th C	fe	7.7	5.1	1.8	6.9		75
Lachish	236	5b-1	8th C	fe	7.8	5.1	1.6	6.0		138
Lachish	237	5b-1	8th C	fe	7.4	5.2	1.9	11.7		140
Lachish	238	5b-1	8th C	fe	6.9	4.9	1.6	7.4		130
Lachish	239	5b-1	8th C	fe	6.9	5.2	1.8	8.0		140
Lachish	240	5a-1	8th C	fe	7.8	5.4	1.7	8.3		77
Lachish	241	5a-1	8th C	fe	7.8	5.4	1.8	8.2		77
Lachish	242	5b-1	8th C	fe	8.5	5.4	1.8	8.3		147
Lachish	243	5b-1	8th C	fe	8.8	5.1	1.8	7.6		139
Lachish	244	5b-1	8th C	fe	6.7	4.5	1.9	8.0		126
Lachish	245	5b-1	8th C	fe	7.3	4.6	1.7	10.7		127
Lachish	246	5b-1	8th C	fe	8.2	5.4	1.9	8.3		146
Lachish	247	5b-1	8th C	fe	7.5	4.9	1.8	7.2		132
Lachish	248	5b-1	8th C	fe	7.3	5.2	1.6	7.3		140
Lachish	249	5b-1?	8th C	fe	8.1	4.4	1.9	12.3		177
Lachish	250	5b-1	8th C	fe	6.9	4.9	1.4	5.8		130
Lachish	251	5b-1	8th C	fe	6.6	5.0	1.6	5.9		133
Lachish	252	5b-1	8th C	fe	7.4	5.1	1.9	9.0		138
Lachish	253	5b-1	8th C	fe	6.8	4.8	1.9	8.0		129
Lachish	254	5a-1	8th C	fe	7.0	4.7	1.9	8.7		70
Lachish	255	5a-1	8th C	fe	7.5	4.7	1.6	7.9		70
Lachish	256	5a-1	8th C	fe	7.7	4.9	1.6	7.9		73
Lachish	257	5a-1	8th C	fe	8.1	5.2	1.8	9.2		76
Lachish	258	5b-1	8th C	fe	8.0	5.4	1.9	9.5		146
Lachish	259	5b-1	8th C	fe	8.6	4.9	1.5	7.6		132
Lachish	260	5b-1	8th C	fe	8.2	4.9	1.9	12.3		132

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Lachish	261	5b-1	8th C	fe	7.7	4.8	1.6	12.7		129
Lachish	262	5a-1	7th C	fe	7.3	4.5*	2.2	11.5		96
Lachish	263	5b-1	8th C	fe	8.5	5.2	1.8	10.0		142
Lachish	264	5a-1	8th C	fe	7.9	4.8	1.7	11.3		72
Lachish	265	5b-1	8th C	fe	7.4	5.4	1.8	9.8		145
Lachish	266	5b-1	8th C	fe	6.9	5.1	1.8	9.5		137
Lachish	267	5b-1	8th C	fe	6.5	5.0	1.6	10.2		133
Lachish	268	5b-1	8th C	fe	6.2	4.4	1.7	6.3		123
Lachish	269	5a-1	8th C	fe	7.0	4.5	1.6	8.1		67
Lachish	270	5a-1	8th C	fe	7.3	4.7	1.8	9.9		70
Lachish	271	5a-1	8th C	fe	7.4	5.0	1.9	10.1		74
Lachish	272	5a-1	8th C	fe	7.1	4.6	1.7	8.0		69
Lachish	273	5a-1	8th C	fe	7.3	4.8	1.8	8.0		72
Lachish	274	5a-1	8th C	fe	7.0	4.5	1.6	6.9		67
Lachish	275	5b-1	8th C	fe	9.9	6.5	2.2	12.5		163
Lachish	276	5b-1	8th C	fe	10.3	6.6	1.7	16.3		164
Lachish	277	5b-1	8th C	fe	10.0	7.6	1.3	12.7		170
Lachish	278	5b-1	8th C	fe	8.9	5.3	1.7	12.6		144
Lachish	279	5b-1	8th C	fe	8.1	4.8	1.9	11.9		130
Lachish	280	5b-1	8th C	fe	8.2	4.2	1.5	10.3		122
Lachish	281	5b-1	8th C	fe	8.1	4.4	1.6	8.6		125
Lachish	282	5b-1	8th C	fe	6.5	4.2	1.7	10.4		121
Lachish	283	5b-1	8th C	fe	7.2	3.9	1.4	9.2		118
Lachish	284	5b-1	8th C	fe	8.1	4.1	1.6	9.8		120
Lachish	285	5b-1	8th C	fe	7.3	3.8	1.8	8.3		117
Lachish	286	5b-1	8th C	fe	7.1	4.4	1.8	8.0		124
Lachish	287	5b-1	8th C	fe	8.3	3.5	1.1	12.0		116
Lachish	288	5b-1	8th C	fe	8.6	5.0	1.7	15.3		136
Lachish	289	5b-1	8th C	fe	8.4	5.4	2.0	8.9		147
Lachish	290	5b-1	8th C	fe	8.5	5.0*	1.5	11.1		174
Lachish	291	5b-1	8th C	fe	8.5	4.8	1.6	7.8		130
Lachish	292	5b-1	8th C	fe	8.4	4.9	1.4	9.5		132
Lachish	293	5b-1	8th C	fe	8.4	6.9	1.6	12.2		166
Lachish	294	5b-1	8th C	fe	10.0	5.7	1.8	13.3		154
Lachish	295	5b-1	8th C	fe	8.1	5.3	1.7	7.6		144
Lachish	296	5b-1	8th C	fe	7.9	5.4	2.3	15.1		146
Lachish	297	5b-1	8th C	fe	6.7	4.2	1.6	6.2		121
Lachish	298	5b-1	8th C	fe	5.6	3.1	1.6	6.1		114
Lachish	299	5b-1	8th C	fe	6.5	4.2	2.0	8.3		121
Lachish	300	5b-1	8th C	fe	7.0	4.1	1.9	8.6		120
Lachish	301	5b-1	8th C	fe	6.5	3.4	1.7	9.4		115
Lachish	302	5b-1	8th C	fe	7.3	4.4	1.9	10.8		124
Lachish	303	5a-1	8th C	fe	7.3	4.5	1.8	6.2		68
Lachish	304	5b-1	8th C	fe	6.5	4.4	1.8	6.7		123
Lachish	305	5a-1	8th C	fe	7.0	4.6	1.7	7.5		69
Lachish	306	5a-1	8th C	fe	6.5	4.7	1.9	6.1		70
Lachish	307	5b-1	8th C	fe	6.6	4.4	1.7	9.0		123
Lachish	308	5a-1	8th C	fe	6.3	4.5	1.6	6.6		66
Lachish	309	5a-1	8th C	fe	6.5	3.6	1.5	6.7		59
Lachish	310	5a-1	8th C	fe	6.4	4.2	1.6	5.4		63
Lachish	311	5b-1	8th C	fe	6.8	5.1	1.4	6.3		137
Lachish	312	5b-1	8th C	fe	6.5	4.2	1.5	4.7		120
Lachish	313	5a-1	8th C	fe	5.9	4.3	1.7	5.1		64
Lachish	314	5b-1	8th C	fe	5.5	3.7	1.5	5.3		116
Lachish	315	5b-1	8th C	fe	5.6	4.0	1.5	6.1		118
Lachish	316	5b-1	8th C	fe	5.7	3.2	1.5	7.0		114
Lachish	317	5a-1	8th C	fe	7.1	3.9	1.3	5.7		61

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Lachish	318	5a-1	8th C	fe	6.6	4.0	1.3	3.3		62
Lachish	319	5b-1	8th C	fe	6.9	4.2	1.5	8.0		121
Lachish	320	5b-1	7th C	fe	7.4	4.4	1.6	8.4		124
Lachish	321	5a-1	8th C	fe	7.5	4.5	1.6	5.7		68
Lachish	322	5a-1	8th C	fe	7.5	4.2	1.6	6.3		63
Lachish	323	5a-1	7th C	fe	6.9	4.3	1.6	6.4		65
Lachish	324	5a-1	8th C	fe	7.3	4.5	1.7	9.3		67
Lachish	325	5a-1	8th C	fe	6.6	4.3	1.6	5.5		64
Lachish	326	5b-1	8th C	fe	6.5	4.0	1.4	6.2		118
Lachish	327	5b-1	8th C	fe	6.6	4.7*	1.7	5.9		173
Lachish	328	5b-1	8th C	fe	6.2	4.1	1.3	8.2		119
Lachish	329	5a-1	8th C	fe	6.0	4.5	1.7	6.8		66
Lachish	330	5a-1	8th C	fe	7.3	5.0	1.7	7.1		73
Lachish	331	5b-1	8th C	fe	6.2	4.7	1.7	8.2		127
Lachish	332	5b-1	8th C	fe	6.3	4.5	1.6	7.0		125
Lachish	333	5b-1	8th C	fe	6.5	4.7	1.9	9.5		128
Lachish	334	5b-1	8th C	fe	6.3	4.5	1.7	7.9		125
Lachish	335	5a-1?	8th C	fe	5.7	3.5	1.1	4.6		98
Lachish	336	5b-1	8th C	fe	6.2	4.2	1.3	3.1		120
Lachish	337	5b-1		fe	5.7	3.8	1.2	3.8		117
Lachish	338	5a-1	8th C	fe	6.0	4.0	1.3	5.4		61
Lachish	339	5b-1	8th C	fe	6.1	4.1	1.5	6.8		119
Lachish	340	5a-1	8th C	fe	6.0	4.0*	1.3	5.6		95
Lachish	341	5a-1	7th C	fe	6.3	4.7	1.2	4.6		69
Lachish	342	5b-1	8th C	fe	6.1	4.4	1.5	7.2		123
Lachish	343	5b-1	8th C	fe	5.8	3.7	1.2	4.6		117
Lachish	344	5a-1	8th C	fe	5.9	3.9*	1.8	6.9		95
Lachish	345	5a-1	8th C	fe	6.0	4.8	1.8	7.4		71
Lachish	346	5a-1	8th C	fe	6.1	3.7	1.6	5.5		59
Lachish	347	5a-1	8th C	fe	6.0	3.8	1.6	3.9		60
Lachish	348	5b-1	8th C	fe	5.2	2.8	1.5	4.9		114
Lachish	349	5a-1	8th C	fe	4.6	2.7	1.3	3.6		49
Lachish	350	5a-1	8th C	fe	5.3	3.3	1.5	3.8		56
Lachish	351	5b-1	8th C	fe	5.1	3.0	1.3	3.8		114
Lachish	352	5b-1	8th C	fe	3.9	2.2	0.9	2.9		114
Lachish	353	5a-1	8th C	fe	8.8	7.5	1.2	8.9		86
Lachish	354	5b-1	8th C	fe	9.4	6.9	1.6	14.4		166
Lachish	355	5a-1?	8th-7th C	fe	7.7	6.4	1.6	6.5	cache	101
Lachish	356	5a-1	7th C	fe	8.9	5.9	1.7	15.6		80
Lachish	357	5a-1	7th C	fe	9.0	5.8	1.4	14.3		80
Lachish	358	5b-1	7th C	fe	6.8	4.0	1.7	9.3	destr	119
Lachish	359	5b-1	7th C	fe	7.6	5.2	1.5	7.4		141
Lachish	360	5a-1	8th-7th C	fe	8.3	5.8	1.5	9.5	cache	80
Lachish	361	5b-1	8th C	fe	8.5	5.6	2.1	14.9		151
Lachish	362	5a-1?	7th C	fe	7.0	4.9*	2.2	8.2		102
Lachish	363	5a-1	8th-7th C	fe	7.0	4.8	1.8	9.2	cache	71
Lachish	364	5b-1?	8th C	fe	6.8	5.2	1.8	9.2	cache	178
Lachish	365	5q-1	8th C	fe	7.4	4.4	1.7	12.1		205
Lachish	366	5b-1	8th-7th C	fe	7.0	4.4	1.6	6.4	cache	124
Lachish	367	5a-1?	8th-7th C	fe	5.4	4.4	1.7	5.0	cache	99
Lachish	368	5a-1	8th-7th C	fe	5.7	4.4*	1.6	8.0	cache	96
Lachish	369	5a-1	8th-7th C	fe	5.7	3.9	1.4	4.6	cache	61
Lachish	370	5a-1	8th-7th C	fe	7.3	5.5	1.5	6.4	cache	78
Marlik	1	8	?	bz	19.3	4.3	1.4		burial	219
Marlik	2	8	?	bz	18.0	5.1	1.6*		burial	219
Marlik	3	7d	?	bz	15.0	9.1	2.2		burial	218
Marlik	4	1c-6	1450-950	bz	7.6	4.2	0.7		burial	25

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Marlik	5	5p-7	1550-950	bz	8.0	7.2	4.4		burial	198
Marlik	6	5p-8	1550-950	bz	7.1	6.0	2.9*		burial	199
Marlik	7	5p-8	1550-950	bz	8.9	5.5	3.7		burial	199
Marlik	8	5a-9	1550-950	bz	6.3	6.0	3.7		burial	110
Marlik	9	5q-5	1550-1050	bz	7.1	3.0	1.5		burial	209
Marlik	10	5q-4	1550-1050	bz	7.6	4.1	1.7		burial	208
Marlik	11	5q-4	1550-1050	bz	8.1	3.6	2.5		burial	208
Marlik	12	5q-4	1450-950	bz	7.2	3.4	1.7		burial	208
Marlik	13	5q-22	1450-950	bz	8.5	3.8	2.1		burial	211
Marlik	14	5g-4	1450-950	bz	6.6	2.9	1.8		burial	190
Marlik	15	5g-4	1450-950	bz	7.3	2.7	1.8		burial	190
Marlik	16	5g-4	1450-950	bz	7.1	2.6	1.7		burial	190
Marlik	17	5q-5	1450-1050	bz	9.6	5.1	1.3		burial	210
Marlik	18	5q-5	1450-1050	bz	18.2	10.9	3.1		burial	210
Marlik	19	5q-5	1450-1050	bz	9.5	4.8	1.5		burial	209
Marlik	20	5q-5	1450-1050	bz	10.3	5.1	1.5		burial	210
Marlik	21	5g-4	1450-1050	bz	10.2	6.0	1.8		burial	190
Marlik	22	5g-1	1550-750	bz	10.6	6.5	1.6		burial	189
Marlik	23	5q-4	1550-750	bz	10.7	6.8	1.5		burial	208
Marlik	24	5g-4	1550-750	bz	16.8	9.8	3.0		burial	191
Marlik	25	3a-16	1250-750	bz	4.3	3.3	0.7		burial	45
Marlik	26	3a-16	1250-750	bz	6.1	5.0	1.4		burial	45
Marlik	27	3a-16	1250-750	bz	4.3	3.5	1.5		burial	45
Marlik	28	5p-5	1450-950	bz	7.9	5.5	2.1		burial	197
Marlik	29	5f-5	1450-950	bz	7.5	3.9	1.8		burial	188
Marlik	30	5u-22	1450-950	bz	9.9	7.0	3.0		burial	214
Marlik	31	5q-5	1450-950	bz	9.2	7.1	2.1*		burial	210
Marlik	32	5a-4	1450-950	bz	7.5	6.6	3.0		burial	109
Marlik	33	5f-1	1450-850	bz	9.0	6.2	2.5		burial	187
Marlik	34	5p-1	1450-850	bz	12.0	7.4	2.7		burial	193
Marlik	35	5f-1	1450-850	bz	8.9	6.8	1.8		burial	188
Marlik	36	5p-1!	1450-850	bz	9.3	5.9	2.1		burial	193
Marlik	37	5f-1	1450-850	bz	7.8	5.5	1.8		burial	187
Marlik	38	5p-1	1450-850	bz	6.9	4.3	2.1		burial	192
Marlik	39	5p-2	1450-850	bz	3.3	2.8	1.5		burial	196
Marlik	40	5a-3?	1450-850	bz	3.9	3.3	1.4		burial	108
Marlik	41	5q-6	1350-950	bz	7.1	4.1	1.7		burial	211
Marlik	42	9	?	os	7.4	?	1.8		burial	223
Marlik	43	9	?	os	9.6	9.6?	1.9		burial	223
Marlik	44	9	?	os	10.0	10.0?	1.9		burial	223
Marlik	45	9	?	os	6.8	?	2.2		burial	223
Marlik	46	9	?	os	7.5	?	2.0		burial	223
Marlik	47	9	?	os	5.8	5.8?	1.6		burial	223
Marlik	48	9	?	os	8.3	8.3?	1.8		burial	223
Nimrud	1	5b-1	late 7th C	fe	6.8	4.0	1.6	9.5	destr.	118
Nimrud	2	5b-1	late 7th C	fe	7.4	4.3	1.7	11	destr.	122
Nimrud	3	5b-1	late 7th C	fe	9.1	6.0	1.9	16	destr.	156
Nimrud	4	5b-1	late 7th C	fe	8.7	5.5	1.9	13	destr.	148
Nimrud	5	5b-1	late 7th C	fe	6.3	3.5	1.6	7.5	destr.	116
Nimrud	6	5b-1?	late 7th C	fe	7.6	5.1	1.9	12.5	destr.	178
Nimrud	7	5b-1	late 7th C	fe	6.9	4.2	1.7	11	destr.	121
Nimrud	8	5b-1	late 7th C	fe	6.3	3.9	1.7	9	destr.	118
Nimrud	9	5b-1	late 7th C	fe	6.0	4.4	1.8	11	destr.	123
Nimrud	10	5b-1	late 7th C	fe	7.2	4.7	1.9	12	destr.	128
Nimrud	11	5b-1	late 7th C	fe	7.2	4.9	1.6	10.5	destr.	131
Nimrud	12	5b-1	late 7th C	fe	7.8	4.8	1.4	6	destr.	129
Nimrud	13	5b-1	late 7th C	fe	10.7	6.7	2.3	24	destr.	165

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Nimrud	14	5b-1	late 7th C	fe	8.9	5.5	1.7	17	destr.	149
Nimrud	15	5b-1?	late 7th C	fe	8.9	7.9	1.6	13	destr.	180
Nimrud	16	5b-1?	late 7th C	fe	9.2	5.3	1.8	18	destr.	178
Nimrud	17	5b-1	late 7th C	fe	6.0	3.4	1.4	4	destr.	115
Nimrud	18	5b-1	late 7th C	fe	5.6	3.3	1.3	4.5	destr.	114
Nimrud	19	5b-1?	late 7th C	fe	5.0	3.9	1.5	4.5	destr.	176
Nimrud	20	5b-1?	late 7th C	fe	4.9	3.4	1.4	3.5	destr.	175
Nimrud	21	5b-1	late 7th C	fe	5.8	3.3	1.4	4.5	destr.	114
Nimrud	22	5b-1?	late 7th C	fe	4.8	3.5	1.4	4	destr.	176
Nimrud	23	5b-1?	late 7th C	fe	5.4	3.7	1.6	5	destr.	176
Nimrud	24	5b-1	late 7th C	fe	5.7	3.5	1.6	6.5	destr.	116
Nimrud	25	5b-1	late 7th C	fe	4,9	3.4	1.8	7	destr.	116
Nimrud	26	5b-1	late 7th C	fe	4.9	2.5*	1.4	4.5	destr.	171
Nimrud	27	5b-1	late 7th C	fe	4.9	3.2*	1.4	3.5	destr.	171
Nimrud	28	5b-1?	late 7th C	fe	4.1	2.0	1.2	2.5	destr.	175
Nimrud	29	5b-1	late 7th C	fe	7.0	5.2	1.4	10	destr.	140
Nimrud	30	5b-1	late 7th C	fe	6.7	3.8*	1.8	13.5	destr.	172
Nimrud	31	5b-1	late 7th C	fe	7.3	4.6	1.6	9.5	destr.	127
Nimrud	32	5b-1	late 7th C	fe	7.4	5.8	1.5	8.5	destr.	154
Nimrud	33	5b-1	late 7th C	fe	6.8	4.3*	1.7	8	destr.	173
Nimrud	34	5b-1	late 7th C	fe	6.8	4.7	1.4	8	destr.	128
Nimrud	35	5b-1	late 7th C	fe	5.4	2.9*	1.5	6.5	destr.	171
Nimrud	36	5b-1	late 7th C	fe	6.5	3.7	1.6	6	destr.	117
Nimrud	37	5b-1	late 7th C	fe	6.3	3.8	1.4	5	destr.	117
Nimrud	38	5b-1	late 7th C	fe	6.2	3.6*	1.6	6	destr.	172
Nimrud	39	5b-1	late 7th C	fe	7.1	4.0	1.5	6.5	destr.	119
Nimrud	40	5b-1	late 7th C	fe	5.2	2.9*	1.5	4.5	destr.	171
Nimrud	41	5b-1	late 7th C	fe	5.7	3.1*	1.7	5	destr.	171
Nimrud	42	5a-1	late 7th C	fe	5.3	3.5	1.5	5	destr.	58
Nimrud	43	5a-1	late 7th C	fe	5.1	3.4	1.5	4	destr.	56
Nimrud	44	5a-1	late 7th C	fe	5.3	2.9*	1.3	3	destr.	93
Nimrud	45	5a-1	late 7th C	fe	4.7	2.7	1.1	2.5	destr.	50
Nimrud	46	5a-1	late 7th C	fe	6.0	2.8*	1.5	3.5	destr.	92
Nimrud	47	5a-1	late 7th C	fe	4.6	2.5*	1.2	3	destr.	90
Nimrud	48	5a-1	late 7th C	fe	5.1	2.6*	1.5	3.5	destr.	90
Nimrud	49	5a-1	late 7th C	fe	4.6	2.5	1.2	3	destr.	48
Nimrud	50	5a-1	late 7th C	fe	5.1	3.0*	1.3	4	destr.	93
Nimrud	51	5a-1	late 7th C	fe	4.7	2.8	1.4	3.5	destr.	50
Nimrud	52	5a-1	late 7th C	fe	5.1	2.9*	1.5	3	destr.	92
Nimrud	53	5a-1	late 7th C	fe	5.2	3.4	1.4	3.5	destr.	56
Nimrud	54	5a-1	late 7th C	fe	5.7	3.4	1.5	5	destr.	57
Nimrud	55	5a-1	late 7th C	fe	5.2	3.2	1.3	3	destr.	55
Nimrud	56	5a-1	late 7th C	fe	5.0	2.7*	1.2	2.5	destr.	91
Nimrud	57	5a-1	late 7th C	fe	4.8	3.0*	1.5	4.5	destr.	93
Nimrud	58	5a-1	late 7th C	fe	5.6	3.5	1.4	4	destr.	58
Nimrud	59	5a-1	late 7th C	fe	5.6	3.4	1.6	5	destr.	57
Nimrud	60	5a-1	late 7th C	fe	4.2	3.1	1.3	2.5	destr.	53
Nimrud	61	5a-1	late 7th C	fe	4.5	2.3*	1.3	3	destr.	88
Nimrud	62	5a-1	late 7th C	fe	4.4	2.9	1.1	2	destr.	51
Nimrud	63	5a-1	late 7th C	fe	4.0	2.6	1.3	2.5	destr.	49
Nimrud	64	5a-1	late 7th C	fe	4.6	2.7*	1.2	4	destr.	91
Nimrud	65	5a-1	late 7th C	fe	3.7	2.1*	1.2	2	destr.	88
Nimrud	66	5a-1	late 7th C	fe	5.0	2.9	1.3	3	destr.	51
Nimrud	67	5a-1	late 7th C	fe	4.5	2.9	1.1	2.5	destr.	51
Nimrud	68	5a-1	late 7th C	fe	5.0	3.5	1.3	3.5	destr.	58
Nimrud	69	5a-1	late 7th C	fe	5.3	3.4	1.4	3	destr.	57
Nimrud	70	5a-1	late 7th C	fe	5.1	2.7	1.3	3.5	destr.	50

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Nimrud	71	5a-1	late 7th C	fe	5.1	3.0	1.1	3	destr.	52
Nimrud	72	5a-1	late 7th C	fe	4.5	2.6	1.3	2.5	destr.	49
Nimrud	73	5a-1	late 7th C	fe	4.7	2.9*	1.2	3.5	destr.	92
Nimrud	74	5a-1	late 7th C	fe	4.3	3.2	1.3	2.5	destr.	54
Nimrud	75	5a-1	late 7th C	fe	4.4	2.2*	1.1	1.5	destr.	88
Nimrud	76	5a-1	late 7th C	fe	5.0	3.2	1.2	4	destr.	54
Nimrud	77	5a-1	late 7th C	fe	5.2	3.1	1.5	4.5	destr.	54
Nimrud	78	5a-1	late 7th C	fe	4.7	3.0	1.4	2.5	destr.	52
Nimrud	79	5a-1	late 7th C	fe	4.5	2.3*	1.5	3.5	destr.	88
Nimrud	80	5a-1	late 7th C	fe	5.2	3.3	1.4	3	destr.	55
Nimrud	81	5a-1	late 7th C	fe	5.4	2.4*	1.3	3.5	destr.	89
Nimrud	82	5a-1	late 7th C	fe	4.5	2.6*	1.3	2.5	destr.	90
Nimrud	83	5a-1	late 7th C	fe	5.0	2.8	1.3	3.5	destr.	50
Nimrud	84	5a-1	late 7th C	fe	4.7	3.0*	1.3	2.5	destr.	93
Nimrud	85	5a-1	late 7th C	fe	5.3	3.3	1.3	4	destr.	55
Nimrud	86	5a-1	late 7th C	fe	5.1	2.9*	1.3	3.5	destr.	92
Nimrud	87	5a-1	late 7th C	fe	6.2	3.3*	1.5	3.5	destr.	94
Nimrud	88	5a-1	late 7th C	fe	5.3	3.1*	1.3	4	destr.	94
Nimrud	89	5a-1	late 7th C	fe	5.0	3.1	1.3	3	destr.	53
Nimrud	90	5a-1	late 7th C	fe	5.3	3.3*	1.3	3.5	destr.	94
Nimrud	91	5a-1	late 7th C	fe	4.9	2.8*	1.5	4	destr.	92
Nimrud	92	5a-1	late 7th C	fe	4.7	3.3	1.3	2.5	destr.	55
Nimrud	93	5a-1	late 7th C	fe	5.4	3.3	1.3	4.5	destr.	56
Nimrud	94	5a-1	late 7th C	fe	4.7	2.8	1.2	3	destr.	50
Nimrud	95	5a-1	late 7th C	fe	5.0	2.8	1.5	3	destr.	51
Nimrud	96	5a-1	late 7th C	fe	4.4	2.8	1.2	2.5	destr.	50
Nimrud	97	5a-1	late 7th C	fe	5.5	3.4	1.4	4	destr.	57
Nimrud	98	5a-1	late 7th C	fe	5.0	3.1*	1.4	3.5	destr.	94
Nimrud	99	5a-1	late 7th C	fe	4.8	2.8	1.4	4	destr.	50
Nimrud	100	5a-1	late 7th C	fe	5.6	3.6*	1.3	4	destr.	95
Nimrud	101	5a-1	late 7th C	fe	3.7	2.6*	1.3	2.5	destr.	90
Nimrud	102	5a-1	late 7th C	fe	4.2	2.4	1.3	3	destr.	48
Nimrud	103	5a-1	late 7th C	fe	4.5	2.5*	1.2	2	destr.	89
Nimrud	104	5a-1	late 7th C	fe	4.3	2.6*	1.1	2	destr.	90
Nimrud	105	5a-1	late 7th C	fe	4.7	2.8*	1	1.5	destr.	91
Nimrud	106	5a-1	late 7th C	fe	4.4	2.8	1.1	1.5	destr.	50
Nimrud	107	5a-1	late 7th C	fe	4.3	2.3*	1.2	2.5	destr.	88
Nimrud	108	5a-1	late 7th C	fe	4.7	2.9	1.2	2.5	destr.	51
Nimrud	109	5a-1	late 7th C	fe	4.7	3.0	1.3	2.5	destr.	52
Nimrud	110	5a-1	late 7th C	fe	4.2	2.5	1.2	2	destr.	48
Nimrud	111	5a-1	late 7th C	fe	4.9	2.7	1.2	2.5	destr.	50
Nimrud	112	5a-1	late 7th C	fe	5.6	3.1	1.2	3	destr.	54
Nimrud	113	5a-1	late 7th C	fe	5.0	3.0	1.2	4	destr.	52
Nimrud	114	5a-1	late 7th C	fe	5.2	3.0*	1.4	3.5	destr.	93
Nimrud	115	5a-1	late 7th C	fe	5.0	2.9*	1.3	3.5	destr.	92
Nimrud	116	5a-1	late 7th C	fe	5.3	3.1	1.3	3	destr.	54
Nimrud	117	5a-1	late 7th C	fe	4.9	2.9	1.3	3.5	destr.	51
Nimrud	118	5a-1	late 7th C	fe	4.8	2.8*	1.6	5.5	destr.	92
Nimrud	119	5a-1	late 7th C	fe	4.8	2.6*	1.3	3	destr.	90
Nimrud	120	5a-1	late 7th C	fe	5.1	3.1	1.7	4	destr.	54
Nimrud	121	5a-1	late 7th C	fe	5.1	2.5*	1.5	3	destr.	90
Nimrud	122	5a-1	late 7th C	fe	5.0	3.4	1.4	4	destr.	56
Nimrud	123	5a-1	late 7th C	fe	5.2	3.0	1.2	2	destr.	53
Nimrud	124	5a-1	late 7th C	fe	4.3	3.1	1.3	2.5	destr.	53
Nimrud	125	5a-1	late 7th C	fe	5.4	2.9	1.3	3.5	destr.	51
Nimrud	126	5a-1	late 7th C	fe	5.1	2.9*	1.2	2.5	destr.	92
Nimrud	127	5a-1	late 7th C	fe	4.0	2.0*	1.1	1.5	destr.	88

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Nimrud	128	5a-1	late 7th C	fe	4.4	2.4*	1.1	2.5	destr.	89
Nimrud	129	5a-1	late 7th C	fe	4.5	2.6	1	1.5	destr.	49
Nimrud	130	5a-1	late 7th C	fe	3.8	2.5	1	1.5	destr.	48
Nimrud	131	5a-1	late 7th C	fe	4.2	2.3*	1.3	2	destr.	88
Nimrud	132	5a-1	late 7th C	fe	5.0	3.3	1.2	4	destr.	55
Nimrud	133	5a-1	late 7th C	fe	5.0	3.0	1.1	3	destr.	52
Nimrud	134	5a-1	late 7th C	fe	5.1	2.8*	1.4	3.5	destr.	92
Nimrud	135	5a-1	late 7th C	fe	5.6	3.5	1.4	3.5	destr.	58
Nimrud	136	5a-1	late 7th C	fe	5.2	2.9*	1.3	3	destr.	92
Nimrud	137	5a-1	late 7th C	fe	5.7	3.4	1.4	5.5	destr.	57
Nimrud	138	5a-1	late 7th C	fe	6.4	3.9	1.5	5.5	destr.	61
Nimrud	139	5a-1	late 7th C	fe	6.0	4.3	1.3	4	destr.	64
Nimrud	140	5a-1	late 7th C	fe	6.0	3.7	1.6	6	destr.	59
Nimrud	141	5a-1	late 7th C	fe	6.0	3.9	1.4	4.5	destr.	61
Nimrud	142	5a-1	late 7th C	fe	5.0	3.0*	1.4	3.5	destr.	93
Nimrud	143	5a-1	late 7th C	fe	5.2	3.2	1.4	3.5	destr.	55
Nimrud	144	5a-1	late 7th C	fe	5.5	2.9	1.3	2.5	destr.	51
Nimrud	145	5a-1	late 7th C	fe	5.1	3.3*	1.3	3	destr.	94
Nimrud	146	5a-1	late 7th C	fe	4.8	3.0*	1.4	2.5	destr.	93
Nimrud	147	5a-1	late 7th C	fe	4.7	2.6*	1.3	4	destr.	90
Nimrud	148	5a-1	late 7th C	fe	4.9	3.1	1.5	3	destr.	53
Nimrud	149	5a-1	late 7th C	fe	3.9	2.8*	1.2	2.5	destr.	91
Nimrud	150	5a-1	late 7th C	fe	5.0	3.2*	1.5	3	destr.	94
Nimrud	151	5a-1	late 7th C	fe	4.9	3.1*	1.4	3	destr.	94
Nimrud	152	5a-1	late 7th C	fe	4.7	3.1	1.3	2.5	destr.	53
Nimrud	153	5a-1	late 7th C	fe	5.0	2.9*	1.3	3.5	destr.	92
Nimrud	154	5a-1	late 7th C	fe	4.6	2.5*	1.3	3	destr.	90
Nimrud	155	5a-1	late 7th C	fe	5.2	3.1	1.4	4	destr.	54
Nimrud	156	5a-1	late 7th C	fe	5.1	3.1*	1.3	3.5	destr.	94
Nimrud	157	5a-1	late 7th C	fe	4.6	3.1*	1.3	2.5	destr.	93
Nimrud	158	5a-1	late 7th C	fe	4.6	2.4*	1.5	4	destr.	89
Nimrud	159	5a-1	late 7th C	fe	4.7	2.6*	1.3	2	destr.	90
Nimrud	160	5a-1	late 7th C	fe	4.1	3.2	1.4	3.5	destr.	54
Nimrud	161	5a-1	late 7th C	fe	5.4	3.1*	1.4	4.5	destr.	94
Nimrud	162	5a-1	late 7th C	fe	4.5	2.9	1.3	2.5	destr.	51
Nimrud	163	5a-1	late 7th C	fe	5.1	3.6	1.6	4.5	destr.	58
Nimrud	164	5a-1	late 7th C	fe	5.3	3.1	1.3	4.5	destr.	54
Nimrud	165	5a-1	late 7th C	fe	5.1	3.2	1.3	2.5	destr.	54
Nimrud	166	5a-1	late 7th C	fe	4.7	3.8*	1.4	4	destr.	95
Nimrud	167	5a-1	late 7th C	fe	5.8	3.5	1.3	3.5	destr.	58
Nimrud	168	5a-1	late 7th C	fe	5.3	2.9*	1.2	3.5	destr.	92
Nimrud	169	5a-1	late 7th C	fe	5.4	3.3	1.5	4	destr.	56
Nimrud	170	5a-1	late 7th C	fe	5.8	3.5	1.4	4	destr.	58
Nimrud	171	5a-1	late 7th C	fe	5.2	2.6*	1.3	3	destr.	91
Nimrud	172	5a-1	late 7th C	fe	5.5	3.6	1.3	2.5	destr.	58
Nimrud	173	5a-1	late 7th C	fe	5.2	3.4	1.3	3	destr.	56
Nimrud	174	5a-1	late 7th C	fe	4.6	2.3*	1.2	2.5	destr.	89
Nimrud	175	5a-1	late 7th C	fe	4.8	2.7*	1.4	3	destr.	91
Nimrud	176	5a-1	late 7th C	fe	4.6	2.7	1.4	2.5	destr.	49
Nimrud	177	5a-1	late 7th C	fe	5.9	3.2	1.4	3	destr.	55
Nimrud	178	5a-1	late 7th C	fe	6.3	3.5	1.4	6	destr.	58
Nimrud	179	5a-1	late 7th C	fe	5.4	3.2	1.4	4	destr.	55
Nimrud	180	5a-1	late 7th C	fe	6.0	3.7	1.7	4.5	destr.	59
Nimrud	181	5a-1	late 7th C	fe	5.9	3.8	1.3	3.5	destr.	60
Nimrud	182	5a-1	late 7th C	fe	4.4	2.7*	1.2	2.5	destr.	91
Nimrud	183	5a-1	late 7th C	fe	5.0	2.9*	1.3	3.5	destr.	92
Nimrud	184	5a-1	late 7th C	fe	4.8	2.8*	1.3	2.5	destr.	91

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Nimrud	185	5a-1	late 7th C	fe	4.8	3.1	1.1	3	destr.	53
Nimrud	186	5a-1	late 7th C	fe	5.4	3.0*	1.4	4	destr.	93
Nimrud	187	5a-1	late 7th C	fe	5.5	3.3	1.6	4	destr.	56
Nimrud	188	5a-1	late 7th C	fe	5.3	3.0	1.1	3	destr.	53
Nimrud	189	5a-1	late 7th C	fe	4.8	2.2*	1.6	4	destr.	88
Nimrud	190	5a-1	late 7th C	fe	5.0	2.9	1.2	3	destr.	51
Nimrud	191	5a-1	late 7th C	fe	5.1	3.1	1.3	3.5	destr.	54
Nimrud	192	5a-1	late 7th C	fe	4.6	2.3*	1.3	3	destr.	89
Nimrud	193	5a-1	late 7th C	fe	4.4	3.2	1.4	2.5	destr.	54
Nimrud	194	5a-1	late 7th C	fe	4.2	2.8	1.4	3	destr.	50
Nimrud	195	5a-1	late 7th C	fe	3.3	2.2*	1.2	2	destr.	88
Nimrud	196	5a-1	late 7th C	fe	4.9	2.8	1.3	3	destr.	50
Nimrud	197	5a-1	late 7th C	fe	5.4	3.8	1.7	3.5	destr.	60
Nimrud	198	5a-1	late 7th C	fe	6.0	3.1*	1.6	5	destr.	94
Nimrud	199	5a-1	late 7th C	fe	5.1	3.1	1.5	3	destr.	54
Nimrud	200	5a-1	late 7th C	fe	6.4	3.8	1.1	4.5	destr.	60
Nimrud	201	5a-1	late 7th C	fe	5.2	3.1	1.3	3	destr.	54
Nimrud	202	5a-1	late 7th C	fe	4.6	2.6*	1.3	2.5	destr.	90
Nimrud	203	5a-1	late 7th C	fe	4.0	2.5*	1.1	2.5	destr.	89
Nimrud	204	5a-1	late 7th C	fe	4.5	2.4*	1.3	2.5	destr.	89
Nimrud	205	5a-1	late 7th C	fe	4.1	1.8*	1	2.5	destr.	88
Nimrud	206	5a-1	late 7th C	fe	4.8	2.8*	1.2	3	destr.	91
Nimrud	207	5a-1	late 7th C	fe	5.1	3.4	1.4	4	destr.	56
Nimrud	208	5a-1	late 7th C	fe	4.4	2.4*	1.4	3	destr.	89
Nimrud	209	5a-1	late 7th C	fe	4.7	3.3	1.4	3	destr.	55
Nimrud	210	5a-1	late 7th C	fe	4.8	3.3*	1.6	3.5	destr.	94
Nimrud	211	5a-1	late 7th C	fe	3.9	3.0*	1.3	3.5	destr.	93
Nimrud	212	5a-1	late 7th C	fe	4.5	2.7	1.3	2.5	destr.	49
Nimrud	213	5a-1	late 7th C	fe	3.9	2.5*	1.2	1.5	destr.	89
Nimrud	214	5a-1	late 7th C	fe	4.0	3.0	1.3	2.5	destr.	52
Nimrud	215	5a-1	late 7th C	fe	3.9	2.7	1.3	2	destr.	49
Nimrud	216	5a-1	late 7th C	fe	4.3	2.2*	1.1	3	destr.	88
Nimrud	217	5a-1	late 7th C	fe	3.8	3.0	1.3	2	destr.	52
Nimrud	218	5a-1	late 7th C	fe	3.2	2.8*	1.2	2.5	destr.	91
Nimrud	219	5a-1	late 7th C	fe	4.2	1.9*	1.1	2.5	destr.	88
Nimrud	220	5a-1	late 7th C	fe	4.1	2.7	1.1	2	destr.	49
Nimrud	221	5a-1	late 7th C	fe	3.9	2.6	1.1	1.5	destr.	49
Nimrud	222	5a-1	late 7th C	fe	5.0	2.8*	1.3	2.5	destr.	92
Nimrud	223	5a-1	late 7th C	fe	4.4	2.5*	1.1	2	destr.	89
Nimrud	224	5a-1	late 7th C	fe	4.5	2.4*	1.1	2	destr.	89
Nimrud	225	5a-1	late 7th C	fe	3.9	2.5	1.2	2.5	destr.	48
Nimrud	226	5a-1	late 7th C	fe	4.3	2.7*	1.2	2.5	destr.	91
Nimrud	227	5a-1	late 7th C	fe	4.5	2.5*	1.3	2.5	destr.	90
Nimrud	228	5a-1	late 7th C	fe	4.7	3.0	1.3	2.5	destr.	52
Nimrud	229	5a-1	late 7th C	fe	4.8	2.6*	1.3	2	destr.	90
Nimrud	230	5a-1	late 7th C	fe	4.9	2.5	1.3	3	destr.	48
Nimrud	231	5b-1	late 7th C	fe	7.8	4.3	1.7	13	destr.	122
Nimrud	232	5b-1	late 7th C	fe	7.9	5.1	2	16	destr.	138
Nimrud	233	5q-1	late 7th C	fe	8.6	5.9	1.6	15.0	destr.	206
Nimrud	234	5q-1	late 7th C	fe	8.7	5.9	1.0	10.0	destr.	206
Nimrud	235	5b-1	late 7th C	fe	7.8	5.7	1,5	12	destr.	152
Nimrud	236	5b-1	late 7th C	fe	9.3	5.8*	1.6	19.5	destr.	174
Nimrud	237	5b-1	late 7th C	fe	8.0	3.6	1.4	10	destr.	116
Nimrud	238	5b-1	late 7th C	fe	7.5	3.7*	1.4	10.5	destr.	172
Nimrud	239	5b-1?	late 7th C	fe	6.1	3.9	1.3	7	destr.	176
Nimrud	240	5?	late 7th C	fe	5.9	5.9	2.3	11	destr.	47
Nimrud	241	5a-1	late 7th C	fe	5.1	4.0	1.8	6	destr.	61

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Nimrud	242	5a-1?	late 7th C	fe	4.4	3.6	1.6	4	destr.	98
Nimrud	243	5?	late 7th C	fe	3.5	n/a	2.1	4.5	destr.	47
Nimrud	244	5?	late 7th C	fe	5.1	n/a	2	6	destr.	47
Nimrud	245	5a-1	NA	fe	5.5	3.4	1.4	3	cache	57
Nimrud	246	5a-1	NA	fe	5.3	2.9*	1.3	4	cache	93
Nimrud	247	5a-1	NA	fe	5.0	2.6*	1.3	3	cache	90
Nimrud	248	5a-1	NA	fe	4.7	2.8*	1.2	2.5	cache	91
Nimrud	249	5a-1	NA	fe	3.6	2.1*	1.1	20	cache	88
Nimrud	250	5z-14	NA	fe	6.2	5.4*	1.8	13.0	cache	217
Nimrud	251	5b-1	late 7th C	fe	8.8	5.5	1.5	16	destr.	149
Nimrud	252	5b-1	late 7th C	fe	7.6	4.9*	2	12	destr.	174
Nimrud	253	5a-1	late 7th C	fe	6.6	4.3*	1.7	13	destr.	96
Nimrud	254	5a-1	late 7th C	fe	5.0	3.5*	1.7	8	destr.	94
Nimrud	255	5a-1	late 7th C	fe	6.4	3.9*	1.5	5	destr.	95
Nimrud	256	5a-1	late 7th C	fe	5.5	3.5	1.5	4.5	destr.	58
Nimrud	257	5a-1	late 7th C	fe	5.0	2.7	1.1	2.5	destr.	50
Nimrud	258	5a-1	late 7th C	fe	6.7	4.0	1.5	9	destr.	62
Nimrud	259	5a-1	late 7th C	fe	5.4	3.2	1.2	25	destr.	55
Nimrud	260	5a-1?	late 7th C	fe	5.0	3.9	1.7	7.5	destr.	98
Nimrud	261	5a-1	late 7th C	fe	4.5	2.7*	1.1	2.5	destr.	91
Nimrud	262	5a-1	late 7th C	fe	3.6	2.4	1.1	1.5	destr.	48
Nimrud	263	1a-8	late 7th C	fe	6.8	5.2*	1.6	15.5	destr.	20
Nimrud	264	2-3	late 7th C	bz	3.6	2.6*	0.7	5	destr.	34
Nimrud	265	3a-1	late 7th C	bz	3.3	3.3	1.2	4.5	destr.	37
Nimrud	266	3a-8	late 7th C	bz	3.7	2.5	1.1	5	destr.	43
Nimrud	267	3a-2?	late 7th C	bz	2.7	1.5*	0.7	1.5	destr.	40
Nimrud	268	3a-2	late 7th C	bz	4.5	3.8	1.2	3	destr.	39
Nineveh	1	2-1	612	bz	5.0		2.0		destr.	
Nineveh	2	2-1	612	bz	4.5		1.6		destr.	
Nineveh	3	2-1	612	bz	4.7		1.4		destr.	
Nineveh	4	2-3	612	bz	4.6		1.3		destr.	
Nineveh	5	2-1	612	bz	4.6		1.5			
Nineveh	6	3b-3	612	bz	3.3		0.9		destr.	
Nineveh	7	3b-2?	612	bz	2.7		0.7		destr.	
Nineveh	8	3b-2?	612	bz	2.8		0.8		destr.	
Nineveh	9	3a-3	612	bz	3.2		0.8		destr.	
Nineveh	10	3a-3	612	bz	4.2		1.2			
Nineveh	11	3a-2?	612	bz	4.8		1.1		destr.	
Nineveh	12	3a-2?	612	bz	4.2		1.1		destr.	
Nineveh	13	3a-2?	612	bz	5.5		1.7		destr.	
Nineveh	14	3a-2?	612	bz	4.2		1.2		destr.	
Nineveh	15	3a-2?	612	bz	5.6		1.2		destr.	
Nineveh	16	3a-2?	612	bz	4.0		1.1		destr.	
Nineveh	17	3a-2?	612	bz	5.1		1.2		destr.	
Nineveh	18	3a-2?	612	bz	3.7		1.0		destr.	
Nineveh	19	3a-2?	612	bz	3.0				destr.	
Nineveh	20	3a-2?	612	bz	3.8		1.1		destr.	
Nineveh	21	3a-2?	612	bz	3.6		1.0		destr.	
Nineveh	22	5b-1	612	fe	7.0		0.8		destr.	
Nippur	1	5a-1	NA	bz	5.3	3.0	1.2			53
Nippur	2	5p-1	NA	fe	6.0	3.8*	1.6		burial	195
Nippur	3	3a-1?	NB-Ach	bz	3.1	3.1*	1.0			37
Nippur	4	6	NB-Ach	bz	4.0	1.9	0.9			218
Nippur	5	5b-1	NB-Ach	fe	9.9	5.7	1.8		burial	153
Nush-i Jan	1	5a-1	700-500	fe	4.2	3.5	1.2			57
Nush-i Jan	2	5b-4?	700-500	fe	3.2	1.5*	1.1			181
Nush-i Jan	3	5a-2?	700-500	fe	3.8	2.1*	1.9			106

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Nush-i Jan	4	5b-1?	700-500	fe	3.0	1.8*	1.3			180
Nush-i Jan	5	5?	700-500	fe	4.4	?	1.6			47
Nush-i Jan	6	1a-3	700-500	fe	3.3	1.9*	0.9			18
Nush-i Jan	7	5a-21	700-500	bz	3.6	2.6	1.2			111
Nush-i Jan	8	5p-20	700-500	bz	3.1	2.7	1.5			200
Nush-i Jan	9	5a-21	700-500	bz	2.5	1.5	1.0			111
Nush-i Jan	10	5a-1?	700-500	bz	2.8	1.5*	1.1			101
Nush-i Jan	11	5a-1!	700-500	bz	11.3	8.2	1.9			87
Nush-i Jan	12	3a-2	700-500	bz	4.4	3.6	1.0			39
Nush-i Jan	13	3a-11	700-500	bz	3.2	2.9*	1.2			44
Nush-i Jan	14	3a-5?	700-500	bz	2.3	2.1	1.2			42
Nush-i Jan	15	3a-2?	700-500	bz	3.3	3.8	0.8			40
Sialk	1	1a-2	9th-7th C	bz	13.1	8.5	2.9		burial	17
Sialk	2	1a-2	9th-7th C	bz	11.8	7.2	2.7		burial	17
Sialk	3	1a-2	9th-7th C	bz	9.9	5.9	2.6		burial	16
Sialk	4	1a-7	9th-7th C	bz	10.9	4.5	2.5		burial	19
Sialk	5	1a-7	9th-7th C	bz	7.4	4.4	2.3		burial	19
Sialk	6	1a-7	9th-7th C	bz	6.6	4.4	2.7		burial	19
Sialk	7	1a-7?	9th-7th C	bz	12.6	3.7	3.1		burial	19
Sialk	8	5a-1	9th-7th C	fe	13.8	8.5	2.8		burial	87
Sialk	9	5p-1	9th-7th C	fe	19.7	11.8	3.3		burial	194
Sialk	10	5a-1	9th-7th C	fe	11.0	7.5	2.6		burial	86
Sialk	11	5a-1	9th-7th C	fe	10.8	7.6	2.4		burial	86
Sialk	12	5a-1	9th-7th C	fe	10.8	6.8	2.2		burial	85
Sialk	13	5a-1	9th-7th C	fe	9.0	6.5	2.3		burial	82
Sialk	14	5a-1	9th-7th C	fe	9.1	6.5	2.3		burial	83
Sialk	15	5a-1	9th-7th C	fe	8.6	5.4	2.3		burial	78
Sialk	16	5a-3	9th-7th C	bz	14.7	6.5*	3.8		burial	108
Sialk	17	5p-19?	9th-7th C	bz	11.4	7.8	2.7		burial	200
Sialk	18	5a-2	9th-7th C	bz	9.8	6.7	2.3		burial	104
Sialk	19	5p-20?	9th-7th C	bz	9.7	7.3	2.5		burial	201
Sialk	20	5p-19?	9th-7th C	bz	11.9	8.9	2.6		burial	200
Sialk	21	5p-20?	9th-7th C	bz	11.9	8.6	2.8		burial	202
Sialk	22	5a-2	9th-7th C	bz	11.6	7.4	3.5		burial	105
Sialk	23	5a-1	9th-7th C	fe	9.6	6.6	2.2		burial	83
Sialk	24	5a-1	9th-7th C	fe	7.5	5.2	2.2		burial	75
Sialk	25	1a-2	9th-7th C	fe	8.0	3.1	1.1		burial	15
Sialk	26	1a-2	9th-7th C	fe	6.9	3.5	1.0		burial	15
Sialk	27	1a-2	9th-7th C	fe	6.4	3.1	0.9		burial	15
Sialk	28	5a-1	9th-7th C	fe	8.5	7.1	2.0		burial	85
Sialk	29	5a-1	9th-7th C	fe	5.4	4.7	1.2		burial	69
Sialk	30	5a-1	9th-7th C	?	7.8	5.4	2.0		burial	77
Sialk	31	5a-1	9th-7th C	?	7.9	5.8	1.9		burial	79
Sialk	32	5p-20?	9th-7th C	?	7.8	6.0	1.9		burial	201
Sialk	33	5p-20?	9th-7th C	?	7.4	5.8	1.9		burial	201
Sialk	34	5a-2	9th-7th C	?	7.6	5.8	1.7		burial	103
Sialk	35	5a-4?	9th-7th C	fe	7.3	4.6	1.9		burial	109
Sialk	36	5a-4	9th-7th C		14.6	11.2	3.1		burial	109
Sialk	37	5a-1	9th-7th C	bz	9.5	6.2	2.0		burial	82
Sialk	38	5f-1?	9th-7th C	bz	9.1	6.0	1.9		burial	188
Sialk	39	5a-1	9th-7th C	bz	8.2	5.8	1.9		burial	79
Sialk	40	5a-1	9th-7th C	bz	8.8	6.8	1.7		burial	84
Sialk	41	5p-20	9th-7th C	bz?	13.3	8.0	2.8		burial	201
Sialk	42	5p-23	9th-7th C	??	10.2	7.0	3.1		burial	203
Sialk	43	5p-22	9th-7th C	??	9.9	6.4	2.8		burial	203
Sialk	44	5a-1	9th-7th C	bz	10.4	6.8	2.0		burial	84
Sialk	45	5p-1	9th-7th C	bz	10.5	7.3	2.6		burial	193

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Sialk	46	5b-1	9th-7th C	bz	10.5	4.9	1.9		burial	133
Sialk	47	5b-1	9th-7th C	bz	10.4	4.2	1.8		burial	122
Sialk	48	5a-3	9th-7th C	bz	11.9	8.0	2.8		burial	107
Sialk	49	5p-20?	9th-7th C	bz	17.5	12.7	3.9		burial	202
Sialk	50	5p-1	9th-7th C	bz	12.4	8.2	2.9		burial	194
Sialk	51	1a-4	9th-7th C	bz	11.5	6.6	1.2		burial	18
Sialk	52	1a-4	9th-7th C	bz	9.0	5.4	1.0		burial	18
Sialk	53	5a-2	9th-7th C	bz	10.8	6.6	2.1		burial	104
Sialk	54	5a-1	9th-7th C	bz	8.4	5.2	1.6		burial	76
Sialk	55	5a-3	9th-7th C	bz	11.9	7.8	2.5		burial	107
Sialk	56	5a-2	9th-7th C	bz	8.9	5.7	1.7		burial	103
Sialk	57	5a-1	9th-7th C	??	10.0	7.5	2.1		burial	86
Sialk	58	5u-1	9th-7th C	??	9.5	7.0	1.5		burial	213
Sialk	59	5u-1	9th-7th C	??	9.5	7.2	1.0		burial	213
Sialk	60	5a-1	9th-7th C	??	7.2	4.6	1.3		burial	69
Sialk	61	5a-1	9th-7th C	??	4.7	3.1	0.8		burial	53
Sialk	62	5a-1	9th-7th C	??	3.7	2.2	0.6		burial	48
Sialk	63	1c-2	9th-7th C	??	2.2	1.0	0.4		burial	23
Sialk	64	1c-2	9th-7th C	??	3.5	1.2	0.5		burial	23
Sialk	65	1c-2	9th-7th C	??	3.9	1.3	0.6		burial	23
Sialk	66	1a-2	9th-7th C	??	5.3	2.4	0.8		burial	15
Sialk	67	1a-4	9th-7th C	??	6.4	2.9	0.8		burial	18
Sialk	68	1a-4	9th-7th C	??	8.2	4.7	1.0		burial	18
Sialk	69	5u-21	9th-7th C	??	9.0	5.2	1.6		burial	213
Sialk	70	5u-21	9th-7th C	??	8.5	5.6	2.3		burial	213
Sialk	71	5r-20	9th-7th C	??	5.1	1.6	1.2		burial	212
Sialk	72	5u-21!	9th-7th C	??	4.5	1.8	1.7		burial	213
Sialk	73	3b-2	9th-7th C	??	2.2	1.7	0.8		burial	45
Sialk	74	3a-5	9th-7th C	??	2.6	2.0	1.1		burial	42
Sialk	75	5p-1	9th-7th C	??	11.1	7.6	1.4		burial	194
Sialk	76	5r-1	9th-7th C	??	13.5	7.4	2.1		burial	212
Sialk	77	5r-4	9th-7th C	??	9.9	4.5	2.8		burial	212
Sialk	78	5p-1	9th-7th C	??	6.1	4.4	2.8		burial	192
Sialk	79	5a-49	9th-7th C	??	8.5	4.9	2.3		burial	113
Sultantepe	1	5q-5	late NA?	bz	8.2	4.2	2.1		destr.	209
Sultantepe	2	5a-1	late NA?	fe	7.6	5.5	1.7		destr.	78
Sultantepe	3	3a-19	post NA?	fe	7.1	5.3	1.5		burial	45
Sultantepe	4	3a-2	late NA?	bz	4.4	3.6	1.2		destr.	39
Sultantepe	5	3a-19	late NA?	fe	3.9	3.5	1.3		destr.	45
Tell Knedig	1	5b-1	NA	fe	7.2	6.2	1.6		burial	158
Tell Knedig	2	5b-1	NA	fe	7.5	6.0	1.9		burial	156
Tell Knedig	3	5b-1	NA	fe	10.1	6.3	1.6		burial	161
Tell Knedig	4	5b-1	NA	fe	9.5	5.6	1.3		burial	151
Tell Knedig	5	5b-1	NA	fe	9.7	5.9	1.7		burial	156
Tell Knedig	6	5b-1	NA	fe	9.1	5.9	1.4		burial	156
Tell Knedig	7	5b-1	NA	fe	9.3	6.4	1.9		burial	161
Tell Knedig	8	5b-1	NA	fe	9.4	5.7	1.6		burial	153
Tell Knedig	9	5b-1	NA	fe	11.1	6.2	1.7		burial	160
Tell Knedig	10	5b-37	NA	fe	7.8	5.4	2.3		burial	183
Tell Knedig	11	5b-37	NA	fe	8.7	6.3	2.3		burial	183
Tell Knedig	12	5b-37	NA	fe	8.4	5.6	2.3		burial	183
Tell Knedig	13	5?	NA	fe	3.4	1.8*	1.3*		burial	47
Tell Knedig	14	5b-1	NA	fe	8.6	5.5	1.7			148
Tell Knedig	15	1a-1?	NA	fe	5.1	2.3	1.3		burial	14
Toprakkale	1	3a-3	ca. 650-590	bz	3.7	2.7	0.8			41
Toprakkale	2	3a-3	ca. 650-590	bz	3.9	2.5	0.9			41
Toprakkale	3	2-3	ca. 650-590	bz	3.7	2.7	1			31

Site	No.	Type	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
Toprakkale	4	2-3	ca. 650-590	bz	4.2	3.7	1.3			33
Toprakkale	5	5g-1	ca. 650-590	fe	10.1	5.1	1.6			189
Toprakkale	6	5g-1	ca. 650-590	fe	8.7	6.4	1.9			189
Toprakkale	7	5b-1	ca. 650-590	fe	10.8	5.6	1.4			151
Toprakkale	8	5b-1	ca. 650-590	fe	10.0	5.0	1.8			136
Toprakkale	9	5b-1	ca. 650-590	fe	6.6	3.7	1.9			117
Toprakkale	10	5g-1	ca. 650-590	fe	6.5	3.0	1.2			189
Toprakkale	11	5b-1	ca. 650-590	fe	9.9	6.2	2.4			159
Toprakkale	12	5f-1	ca. 650-590	fe	5.5	3.5	1.1			187
Toprakkale	13	5a-1	ca. 650-590	fe	7.3	4.3	1.6			65
Toprakkale	14	5f-1!	ca. 650-590	fe	7.3	4.4	1.4			187
Toprakkale	15	2-2!	ca. 650-590	fe	6.0	3.5	1.3			28
Toprakkale	16	1a-8?	ca. 650-590	fe	5.7	4.4*	1.1			20
Toprakkale	17	5e-57	ca. 650-590	fe	5.8	2.3	1.4			186
Toprakkale	18	1c-5	ca. 650-590	fe	11.3	7	0.5			25
Toprakkale	19	1c-2	ca. 650-590	fe	7.5	3.4	0.5			24
Toprakkale	20	1c-2	ca. 650-590	fe	6.2	3.5	0.5			24
Toprakkale	21	1a-3	ca. 650-590	fe	7.5	3.2	0.7			18
Toprakkale	22	3a-16!	ca. 650-590	fe	4.6	1.4	0.9			45
Uruk	1	5b-1	NB	fe	7.3	4.0	2.0		burial	119
Uruk	2	5b-1	NB	fe	6.0	3.8	2.0		burial	117
Uruk	3	5a-1	NB	fe	6.7	4.4	2.7		burial	65
Uruk	4	5b-1!	NB	fe	8.6	4.9	2.0		burial	133
Uruk	5	5b-1	NB	fe	8.3	3.8	2.3		burial	118
Uruk	6	5b-1!	NB	fe	9.8	5.0	1.9		burial	136
Uruk	7	5b-1	NB	fe	7.8	4.3*	2.3		burial	173
Uruk	8	5b-1?	NB	fe	6.9	4.3	1.8		burial	176
Uruk	9	5b-1?	NB	fe	7.3	6.2	2.0		burial	179
Uruk	10	5b-1?	NB	fe	6.1	4.5	1.9		burial	177
Uruk	11	5a-1?	NB	fe	6.6	3.9	1.8		burial	99
Uruk	12	1c-1	NB	bz	3.4	1.2	0.6			20
Uruk	13	5b-1	NB	bz	6.0	2.8	1.7		destr?	114
Uruk	14	5q-2!	NB or Ach	bz	4.3	2.9	1.3			207
Uruk	15	2-5	6th C?	bz	4.0	2.7	1.2			35
Uruk	16	2-1	7th-6th C	bz	4.5	3.4	1.8			26
Uruk	17	2-1	7th-6th C	bz	4.8	4.0	1.5			27
Uruk	18	3a-1	7th-6th C	bz	3.8	3.3	1.1			37
Uruk	19	3a-4	NB	bz	3.0	2.7	1.5		burial	42
Uruk	20	3a-7	7th-6th C	bz	3.8	3.2	0.9			43
Uruk	21	3a-2	7th-6th C	bz	4.8	4.4	1.4			40
Uruk	22	5p-2	NB?	bz	7.7	6.5	1.8			196
Uruk	23	1c-1?	NB	bz	3.5	2.2	0.6			22
Uruk	24	5a-1	NB?	bz	4.6	4.0	1.6			61
Uruk	25	5p-1	NB?	bz	4.4	2.9*	1.8			195
Uruk	26	3a-5	7th-6th C	bz	2.5	2.0	0.8			42
Uruk	27	3a-2	7th-6th C	bz	3.9	3.3	1.0			38
Uruk	28	3a-2	7th-6th C	bz	4.0	3.6	1.1			39
Uruk	29	5b-1	NB	fe	7.9	5.6	2.4			150

Appendix B: Arrowheads by Type

The arrowheads are sorted by increasing blade length, with first certain examples with intact blades, then certain examples with broken blades, uncertain examples with intact blades and finally uncertain examples with broken blades. For comparative analysis of arrowhead length, only certain examples with intact blades are used.

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
1a-1	Ayanis	4	ca. 650-590	fe	6.6	3.3	1.3		destr.	12
1a-1	Ayanis	2	ca. 650-590	fe	4.6	3.4	1.3		destr.	12
1a-1	Lachish	181	8th C	fe	5.4	4.6	0.9	5.7		12
1a-1	Lachish	3	7th C	fe	6.8	4.8	1.1		burial	12
1a-1	Gerar	87	?	fe	6.2	5.1	0.5			12
1a-1	Gerar	86	?	fe	8.8	6.1	0.8			12
1a-1	Lachish	180	8th C	fe	8.0	6.6	1.0	9.6		12
1a-1	Lachish	62	7th C	fe	12.0	10.0	1.1	13.3		13
1a-1	Lachish	20	8th-7th C	fe	11.8	10.3	1.0	13.2	cache	13
1a-1	Gerar	91	?	fe	13.8	11.1	0.8			13
1a-1	Lachish	137	7th C	fe	6.5	5.4*	1.2	10.1		13
1a-1?	Tell Knedig	15	NA	fe	5.1	2.3	1.3		burial	14
1a-1?	Gerar	92	?	fe	11.3	9.9	1.0			14
1a-1?	Gerar	89	?	fe	5.7	4.8?	0.9			14
1a-1?	Lachish	136	8th C	fe	7.0	5.9*	1.0	10.9		14
1a-1?	Gerar	90	?	fe	7.4	7.4*	0.8			14
1a-2	Sialk	66	9th-7th C	??	5.3	2.4	0.8		burial	15
1a-2	Sialk	27	9th-7th C	fe	6.4	3.1	0.9		burial	15
1a-2	Sialk	25	9th-7th C	fe	8.0	3.1	1.1		burial	15
1a-2	Gerar	1	?	bz	6.0	3.3	0.7			15
1a-2	Ayanis	3	ca. 650-590	fe	6.2	3.3	1.1		destr.	15
1a-2	Sialk	26	9th-7th C	fe	6.9	3.5	1.0		burial	15
1a-2	Hasanlu	50	8th C	fe	6.3	4.1	0.7		destr.	15
1a-2	Hasanlu	49	8th C	fe	7.1	4.5	1.0		destr.	15
1a-2	Hasanlu	48	8th C	fe	10.0	5.8	1.0		destr.	16
1a-2	Sialk	3	9th-7th C	bz	9.9	5.9	2.6		burial	16
1a-2	Lachish	179	8th C	fe	7.2	6.2	0.9	10.1		16
1a-2	Sialk	2	9th-7th C	bz	11.8	7.2	2.7		burial	17
1a-2	Sialk	1	9th-7th C	bz	13.1	8.5	2.9		burial	17
1a-2	Gerar	88	?	fe	11.5	9.4	0.8			17
1a-2	Lachish	135	8th-7th C	fe	11.5	9.8	1.2	20.9		17
1a-3	Toprakkale	21	ca. 650-590	fe	7.5	3.2	0.7			18
1a-3	Nush-i Jan	6	700-500	fe	3.3	1.9*	0.9			18
1a-4	Sialk	67	9th-7th C	??	6.4	2.9	0.8		burial	18
1a-4	Sialk	68	9th-7th C	??	8.2	4.7	1.0		burial	18
1a-4	Sialk	52	9th-7th C	bz	9.0	5.4	1.0		burial	18
1a-4	Sialk	51	9th-7th C	bz	11.5	6.6	1.2		burial	18
1a-4	Gerar	78	?	fe	9.9	7.4	1.4			18
1a-4?	Gerar	79	?	fe	8.3	6.3	1.3			18
1a-7	Sialk	6	9th-7th C	bz	6.6	4.4	2.7		burial	19
1a-7	Sialk	5	9th-7th C	bz	7.4	4.4	2.3		burial	19
1a-7	Sialk	4	9th-7th C	bz	10.9	4.5	2.5		burial	19
1a-7?	Sialk	7	9th-7th C	bz	12.6	3.7	3.1		burial	19
1a-8	Gerar	69	?	fe	3.8	3.3	1.0			20
1a-8	Nimrud	263	late 7th C	fe	6.8	5.2*	1.6	15.5	destr.	20
1a-8?	Toprakkale	16	ca. 650-590	fe	5.7	4.4*	1.1			20
1c-1	Assur	50	NA?	bz	3.3	1.0	0.4			20
1c-1	Uruk	12	NB	bz	3.4	1.2	0.6			20

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
1c-1	Assur	51	NA?	bz	2.9	1.3	0.3			20
1c-1	Assur	4	NA	bz	3.6	1.7	0.3		burial	20
1c-1	Gerar	12	?	fe	5.6	3.3	0.8			20
1c-1	Hasanlu	51	8th C	fe	5.3	3.5	1.0		destr.	21
1c-1	Gerar	8	?	fe	5.9	4.0	0.9			21
1c-1	Lachish	73	8th C	fe	5.6	4.3	0.9	4.6		21
1c-1	Gerar	11	?	fe	7.2	5.0	0.7			21
1c-1	Lachish	36	8th C	fe	7.0	6.3	0.9	8.0		21
1c-1	Hasanlu	68	8th C	bz	6.3	4.7*	0.6		destr.	21
1c-1	Lachish	138	8th C	fe	7.6	6.0*	1.6	19.1		21
1c-1	Lachish	140	8th C	fe	9.7	9.7*	0.9	8.3		21
1c-1?	Uruk	23	NB	bz	3.5	2.2	0.6			22
1c-1?	Hasanlu	52	8th C	fe	5.2	2.8	1.0		destr.	22
1c-1?	Lachish	75	7th C	fe	4.9	4.7	1.2	4.3		22
1c-1?	Lachish	74	8th C	fe	6.6	5.0	1.1	11.6		22
1c-1?	Lachish	178	8th C	fe	7.4	6.4	1.0	11.1		22
1c-1?	Lachish	177	8th C	fe	9.9	9.4	1.2	22.1		22
1c-1?	Gerar	14	?	fe	5.5	5.0*	1.3			23
1c-1?	Lachish	142	8th C	fe	6.5	6.5*	0.9	3.9		23
1c-1?	Lachish	141	8th C	fe	6.5	6.5*	1.0	8.1		23
1c-2	Sialk	63	9th-7th C	??	2.2	1.0	0.4		burial	23
1c-2	Sialk	64	9th-7th C	??	3.5	1.2	0.5		burial	23
1c-2	Sialk	65	9th-7th C	??	3.9	1.3	0.6		burial	23
1c-2	Hasanlu	53	8th C	fe	3.4	3.0	0.9		destr.	23
1c-2	Ayanis	1	ca. 650-590	fe	6.8	3.0	0.8		destr.	23
1c-2	Ayanis	108	ca. 650-590	bz	6.8	3.1	0.9		destr.	24
1c-2	Lachish	78	7th C	fe	4.6	3.3	0.9	4.0		24
1c-2	Toprakkale	19	ca. 650-590	fe	7.5	3.4	0.5			24
1c-2	Toprakkale	20	ca. 650-590	fe	6.2	3.5	0.5			24
1c-2	Lachish	76	7th C	fe	5.2	4.0	0.9	4.6		24
1c-2	Gerar	15	?	fe	8.4	4.4	1.4			24
1c-2	Lachish	77	7th C	fe	6.4	4.6	1.1	7.0		24
1c-2	Gerar	10	?	fe	6.8	4.9	1.2			24
1c-2	Gerar	13	?	fe	7.1	5.0	1.2			24
1c-2	Gerar	9	?	fe	8.3	6.0	1.0			24
1c-2	Lachish	139	8th C	fe	8.8	7.2	1.4	17.2		25
1c-5	Toprakkale	18	ca. 650-590	fe	11.3	7	0.5			25
1c-6	Marlik	4	1450-950	bz	7.6	4.2	0.7		burial	25
2-1	Uruk	16	7th-6th C	bz	4.5	3.4	1.8			26
2-1	Bastam	22	UR	bz	3.9	3.6	1.2			26
2-1	Ayanis	106	ca. 650-590	bz	3.9	3.6	1.4		destr.	26
2-1	Ayanis	99	ca. 650-590	bz	4.3	3.6	1.3		destr.	26
2-1	Ayanis	98	ca. 650-590	bz	4.4	3.7	1.3		destr.	26
2-1	Ayanis	100	ca. 650-590	bz	4.4	3.7	1.6		destr.	26
2-1	Ayanis	92	ca. 650-590	bz	4.2	3.8	1.3		destr.	26
2-1	Ayanis	93	ca. 650-590	bz	4.6	3.8	1.3		destr.	26
2-1	Ayanis	102	ca. 650-590	bz	4.2	3.9	1.3		destr.	26
2-1	Bastam	16	ca. 650	bz	4.2	3.9	1.4		destr.	27
2-1	Ayanis	91	ca. 650-590	bz	4.2	4.0	1.3		destr.	27
2-1	Ayanis	94	ca. 650-590	bz	4.6	4.0	1.4		destr.	27
2-1	Uruk	17	7th-6th C	bz	4.8	4.0	1.5			27
2-1	Ayanis	103	ca. 650-590	bz	4.2	4.1	2.0		destr.	27
2-1	Ayanis	96	ca. 650-590	bz	4.4	4.1	1.3		destr.	27
2-1	Ayanis	101	ca. 650-590	bz	4.3	4.3	1.2		destr.	27
2-1	Ayanis	95	ca. 650-590	bz	4.7	4.7	1.4		destr.	27
2-1	Ayanis	97	ca. 650-590	bz	4.4	4.4*	1.4		destr.	27

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
2-1	Nineveh	2	612	bz	4.5		1.6		destr.	
2-1	Nineveh	5	612	bz	4.6		1.5			
2-1	Nineveh	3	612	bz	4.7		1.4		destr.	
2-1	Nineveh	1	612	bz	5.0		2.0		destr.	
2-1?	Gerar	26	?	bz	3.3	3.3	0.8			27
2-2	Gerar	5	?	bz	3.2	2.0	1.0			28
2-2	Assur	11	?	bz	3.1	2.4	1.0			28
2-2	Assur	9	?	bz	3.1	2.4	1.1			28
2-2	Assur	38	?	bz	3.6	2.4	1.0			28
2-2	Bastam	23	UR	bz	3.5	2.7	1.1			28
2-2	Bastam	8	ca. 650	bz	3.4	2.8	0.9			28
2-2	Bastam	3	UR	bz	3.2	2.9	1.0			28
2-2!	Toprakkale	15	ca. 650-590	fe	6.0	3.5	1.3			28
2-2	Carchemish	15	late 7th C	bz	4.5	3.7	1.5	5.5	destr.	28
2-2	Bastam	18	ca. 650	bz	5.1	3.7	0.9		destr.	29
2-2	Hasanlu	92	8th-4th C	bz	4.7	3.8	1.5			29
2-2	Bastam	14	ca. 650	bz	4.7	4.1	1.3		destr.	29
2-2!	Hasanlu	38	8th C	fe	7.4	5.8	1.9		destr.	29
2-2	Hasanlu	39	8th C	fe	8.9	5.8	1.7		destr.	29
2-2!	Hasanlu	37	8th C	fe	8.6	6.3	2.0		destr.	29
2-2!	Hasanlu	36	8th C	fe	10.4	6.6	1.9		destr.	30
2-2!	Hasanlu	35	8th C	fe	9.6	6.8	2.0		destr.	30
2-2	Bastam	15	ca. 650	bz	3.2	2.6*	1.1		destr.	30
2-2	Ayanis	104	ca. 650-590	bz	4.3	3.0*	1.2		destr.	30
2-3	Assur	47	NA?	bz	3.0	2.0	1.0			30
2-3	Assur	29	?	bz	3.2	2.1	1.0			30
2-3	Gerar	25	?	bz	3.3	2.3	0.9			30
2-3	Gerar	20	?	bz	4.0	2.6	0.9			30
2-3	Toprakkale	3	ca. 650-590	bz	3.7	2.7	1			31
2-3	Ayanis	83	ca. 650-590	bz	4.0	2.7	1.3		destr.	31
2-3	Ayanis	81	ca. 650-590	bz	4.6	2.7	1.2		destr.	31
2-3	Carchemish	8	late 7th C	bz	4.9	2.9	1.0	4.5	destr.	31
2-3	Ayanis	82	ca. 650-590	bz	4.1	3.0	1.1		destr.	31
2-3	Carchemish	5	late 7th C	bz	5.0	3.0	1.0	5.5	destr.	31
2-3	Assur	30	?	bz	4.9	3.1	1.2			31
2-3	Bastam	19	ca. 650	bz	3.9	3.2	0.6		destr.	31
2-3	Ayanis	85	ca. 650-590	bz	4.5	3.2	1.1		destr.	32
2-3	Gerar	18	?	bz	5.1	3.2	1.3			32
2-3	Ayanis	86	ca. 650-590	bz	4.2	3.3	0.8		destr.	32
2-3	Gerar	19	?	bz	4.7	3.3	1.2			32
2-3	Gerar	17	?	bz	5.2	3.3	1.0			32
2-3	Ayanis	80	ca. 650-590	bz	4.8	3.4	1.3		destr.	32
2-3	Ayanis	84	ca. 650-590	bz	5.1	3.4	1.3		destr.	32
2-3	Ayanis	79	ca. 650-590	bz	4.7	3.5	1.3		destr.	32
2-3	Bastam	2	UR	bz	5.6	3.5	1.5			33
2-3	Carchemish	3	late 7th C	bz	5.1	3.6	1.1	4.5	destr.	33
2-3	Carchemish	4	late 7th C	bz	5.1	3.6	1.1	4.5	destr.	33
2-3	Toprakkale	4	ca. 650-590	bz	4.2	3.7	1.3			33
2-3	Ayanis	75	ca. 650-590	bz	4.7	3.7	1.4		destr.	33
2-3	Ayanis	76	ca. 650-590	bz	4.8	3.8	1.4		destr.	33
2-3	Ayanis	78	ca. 650-590	bz	5.1	3.8	1.2		destr.	34
2-3	Ayanis	77	ca. 650-590	bz	5.2	3.9	1.3		destr.	34
2-3	Ayanis	72	ca. 650-590	bz	5.7	4.0	1.4		destr.	34
2-3	Ayanis	71	ca. 650-590	bz	5.0	4.1	1.4		destr.	34
2-3	Ayanis	74	ca. 650-590	bz	4.8	4.2	1.4		destr.	34
2-3	Ayanis	87	ca. 650-590	bz	3.2	2.0*	1.1		destr.	34
2-3	Nimrud	264	late 7th C	bz	3.6	2.6*	0.7	5	destr.	34

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
2-3	Nineveh	4	612	bz	4.6		1.3		destr.	
2-5	Uruk	15	6th C?	bz	4.0	2.7	1.2			35
2-5	Hasanlu	85	8th-4th C	bz	4.5	3.4	1.5			35
2-5	Gerar	23	?	bz	4.8	3.4	1.5			35
2-5	Gerar	16	?	bz	3.7	2.7*	1.1			35
2-6	Gerar	24	?	bz	4.1	2.1	1.4			35
2-6	Ayanis	73	ca. 650-590	bz	5.9	4.0	1.5		destr.	35
2-7	Ayanis	105	ca. 650-590	bz	3.7	3.3	1.1		destr.	35
2-9	Carchemish	16	late 7th C	bz	3.1	2.1	1.1	3.5	destr.	36
2-11	Gerar	22	?	bz	3.5	2.5	1.2			36
2-14	Hasanlu	87	8th-4th C	bz	3.2	2.2	1.3			36
2-14	Hasanlu	86	8th-4th C	bz	3.4	2.6	1.6			36
2-14	Gerar	21	?	bz	3.7	2.9	1.3			36
3a-1	Assur	33	?	bz	3.5	3.0	1.0*			37
3a-1	Nimrud	265	late 7th C	bz	3.3	3.3	1.2	4.5	destr.	37
3a-1	Uruk	18	7th-6th C	bz	3.8	3.3	1.1			37
3a-1	Gerar	27	?	bz	3.8	3.8	1.4			37
3a-1	Assur	42	?	bz	4.2	4.2	1.3*			37
3a-1?	Assur	43	?	bz	2.9	2.5	1.3			37
3a-1?	Nippur	3	NB-Ach	bz	3.1	3.1*	1.0			37
3a-2	Assur	45	?	bz	2.2	1.7	0.5			37
3a-2	Assur	46	NA?		2.3	1.8	0.5			37
3a-2	Assur	18	?	bz	2.8	1.9	0.8			37
3a-2	Assur	14	?	bz	2.9	1.9	0.9			37
3a-2	Assur	20	?	bz	3.5	2.2	0.8			37
3a-2	Assur	15	?	bz	3.3	2.4	1.1			37
3a-2	Assur	17	?	bz	3.7	2.4	0.9			37
3a-2	Assur	16	?	bz	3.4	2.5	1.0			38
3a-2	Assur	34	?	bz	4.0	2.7	1.1			38
3a-2	Assur	5	?	bz	3.6	2.8	1.1			38
3a-2	Assur	25	?	bz	3.3	2.9	0.9			38
3a-2	Gerar	32	?	bz	3.7	2.9	0.8			38
3a-2	Carchemish	17	late 7th C	bz	4.0	3.0	1.0	4.0	destr.	38
3a-2	Assur	36	?	bz	4.0	3.0	1.0			38
3a-2	Carchemish	19	late 7th C	bz	4.1	3.0	1.0	4.5	destr.	38
3a-2	Assur	35	?	bz	4.2	3.0	1.2			38
3a-2	Carchemish	18	late 7th C	bz	4.1	3.1	1.0	5.0	destr.	38
3a-2	Assur	39	?	bz	4.0	3.2	0.9			38
3a-2	Uruk	27	7th-6th C	bz	3.9	3.3	1.0			38
3a-2	Assur	6	?	bz	4.2	3.4	1.0			38
3a-2	Uruk	28	7th-6th C	bz	4.0	3.6	1.1			39
3a-2	Nush-i Jan	12	700-500	bz	4.4	3.6	1.0			39
3a-2	Sultantepe	4	late NA?	bz	4.4	3.6	1.2		destr.	39
3a-2	Assur	12	?	bz	4.9	3.6	1.1			39
3a-2	Assur	1	NA?	bz	4.1	3.7	1.4		burial	39
3a-2	Gerar	31	?	bz	4.5	3.7	0.9			39
3a-2	Assur	8	?	bz	4.4	3.8	1.1			39
3a-2	Nimrud	268	late 7th C	bz	4.5	3.8	1.2	3	destr.	39
3a-2	Assur	19	?	bz	5.1	3.8	0.9			39
3a-2	Gerar	34	?	bz	4.6	4.0	1.3			40
3a-2	Assur	37	?	bz	5.4	4.2	1.1			40
3a-2	Uruk	21	7th-6th C	bz	4.8	4.4	1.4			40
3a-2	Assur	10	?	bz	5.6	4.4	1.1			40
3a-2	Assur	13	?	bz	5.2	4.8	1.1			40
3a-2?	Gerar	33	?	bz	4.2	3.2	1.0			40
3a-2?	Nush-i Jan	15	700-500	bz	3.3	3.8	0.8			40

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3a-2?	Assur	7	?	bz	4.7	4.4	1.2			40
3a-2?	Nimrud	267	late 7th C	bz	2.7	1.5*	0.7	1.5	destr.	40
3a-2?	Karchaghbyur	9	8th-7th C	bz	3.2	3.2*	0.8		burial	40
3a-2?	Nineveh	19	612	bz	3.0				destr.	
3a-2?	Nineveh	21	612	bz	3.6		1.0		destr.	
3a-2?	Nineveh	18	612	bz	3.7		1.0		destr.	
3a-2?	Nineveh	20	612	bz	3.8		1.1		destr.	
3a-2?	Nineveh	16	612	bz	4.0		1.1		destr.	
3a-2?	Nineveh	12	612	bz	4.2		1.1		destr.	
3a-2?	Nineveh	14	612	bz	4.2		1.2		destr.	
3a-2?	Nineveh	11	612	bz	4.8		1.1		destr.	
3a-2?	Nineveh	17	612	bz	5.1		1.2		destr.	
3a-2?	Nineveh	13	612	bz	5.5		1.7		destr.	
3a-2?	Nineveh	15	612	bz	5.6		1.2		destr.	
3a-3!	Assur	40	?	bz	2.3	1.4	0.8			41
3a-3	Hasanlu	88	8th-4th C	bz	3.5	2.0	1.0			41
3a-3	Assur	52	?	bz	3.5	2.2	0.9			41
3a-3	Hasanlu	90	8th-4th C	bz	3.5	2.3	1.0			41
3a-3	Assur	27	?	bz	3.4	2.4	1.0			41
3a-3	Assur	22	?	bz	3.4	2.5	0.9			41
3a-3	Toprakkale	2	ca. 650-590	bz	3.9	2.5	0.9			41
3a-3	Assur	23	?	bz	4.2	2.5	0.9			41
3a-3	Assur	28	?	bz	3.5	2.7	0.9			41
3a-3	Toprakkale	1	ca. 650-590	bz	3.7	2.7	0.8			41
3a-3	Assur	31	?	bz	4.6	2.9	1.3			41
3a-3	Assur	49	614	bz	4.1	3.0	0.9		destr.	41
3a-3	Assur	24	?	bz	4.8	3.1	0.9			41
3a-3	Assur	32	?	bz	4.9	3.2	1.2			41
3a-3	Gerar	35	?	bz	4.2	3.3	1.1			42
3a-3	Carchemish	1	late 7th C	bz	4.5	3.9	1.1	4.5	destr.	42
3a-3	Carchemish	2	late 7th C	bz	4.5	3.9	1.1	4.5	destr.	42
3a-3	Assur	21	?	bz	6.1	4.7	1.1			42
3a-3	Nineveh	9	612	bz	3.2		0.8		destr.	
3a-3	Nineveh	10	612	bz	4.2		1.2			
3a-4	Uruk	19	NB	bz	3.0	2.7	1.5		burial	42
3a-4	Gerar	30	?	bz	5.0	5.0	1.0			42
3a-5	Uruk	26	7th-6th C	bz	2.5	2.0	0.8			42
3a-5	Sialk	74	9th-7th C	??	2.6	2.0	1.1		burial	42
3a-5	Bastam	10	UR	bz	3.4	2.4	1.1			42
3a-5?	Nush-i Jan	14	700-500	bz	2.3	2.1	1.2			42
3a-7	Assur	48	?	bz	3.9	2.8	1.2			43
3a-7	Uruk	20	7th-6th C	bz	3.8	3.2	0.9			43
3a-7	Gerar	29	?	bz	3.4	3.4	1.3			43
3a-8	Nimrud	266	late 7th C	bz	3.7	2.5	1.1	5	destr.	43
3a-8	Assur	41	?	bz	3.9	2.9	1.0			43
3a-11	Assur	53	?	bz	2.6	2.0	1.1			44
3a-11	Ayanis	107	ca. 650-590	bz	3.5	2.3	1.2		destr.	44
3a-11	Nush-i Jan	13	700-500	bz	3.2	2.9*	1.2			44
3a-14	Carchemish	12	late 7th C	bz	3.0	2.1	1.1	3.0	destr.	44
3a-14	Carchemish	13	late 7th C	bz	3.0	2.1	1.1	3.0	destr.	44
3a-14	Carchemish	14	late 7th C	bz	3.0	2.1	1.1	2.5	destr.	44
3a-14?	Assur	44	?	bz	5.6	4.3	1.3			44
3a-16!	Toprakkale	22	ca. 650-590	fe	4.6	1.4	0.9			45
3a-16	Marlik	25	1250-750	bz	4.3	3.3	0.7		burial	45
3a-16	Marlik	27	1250-750	bz	4.3	3.5	1.5		burial	45
3a-16	Marlik	26	1250-750	bz	6.1	5.0	1.4		burial	45

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3a-19	Hasanlu	91	8th-4th C	bz	5.6	2.8	1.2			45
3a-19	Sultantepe	5	late NA?	fe	3.9	3.5	1.3		destr.	45
3a-19	Sultantepe	3	post NA?	fe	7.1	5.3	1.5		burial	45
3b-1	Gerar	36	?	bz	2.8	2.8	1.1			45
3b-2	Sialk	73	9th-7th C	??	2.2	1.7	0.8		burial	45
3b-2	Hasanlu	89	8th-4th C	bz	2.3	1.7	1.1			45
3b-2?	Nineveh	7	612	bz	2.7		0.7		destr.	
3b-2?	Nineveh	8	612	bz	2.8		0.8		destr.	
3b-3	Nineveh	6	612	bz	3.3		0.9		destr.	
3b-4	Gerar	37	?	bz	3.1	3.1	1.3			45
3b-16	Gerar	28	?	fe	3.9	3.3	1.5			46
3c-2	Assur	26	?	bz	2.6	1.3	0.7			46
4-17	Carchemish	10	late 7th C	bz	5.1	2.2	1.0	6.5	destr.	46
4-17	Carchemish	9	late 7th C	bz	4.3	2.4	1.0	5.0	destr.	46
4-18	Carchemish	11	late 7th C	bz	5.0	2.1	0.9	6.5	destr.	46
4-18	Carchemish	6	late 7th C	bz	4.7	2.4	1.2	6.0	destr.	46
4-18	Carchemish	7	late 7th C	bz	4.8	2.5	1.3	7.0	destr.	46
5?	Nimrud	240	late 7th C	fe	5.9	5.9	2.3	11	destr.	47
5?	Nush-i Jan	5	700-500	fe	4.4	?	1.6			47
5?	Tell Knedig	13	NA	fe	3.4	1.8*	1.3*		burial	47
5?	Lachish	69	9th C	fe	4.4	4.4*	1.3			47
5?	Nimrud	243	late 7th C	fe	3.5	n/a	2.1	4.5	destr.	47
5?	Nimrud	244	late 7th C	fe	5.1	n/a	2	6	destr.	47
5a-1	Sialk	62	9th-7th C	??	3.7	2.2	0.6		burial	48
5a-1	Nimrud	262	late 7th C	fe	3.6	2.4	1.1	1.5	destr.	48
5a-1	Nimrud	102	late 7th C	fe	4.2	2.4	1.3	3	destr.	48
5a-1	Nimrud	130	late 7th C	fe	3.8	2.5	1	1.5	destr.	48
5a-1	Nimrud	225	late 7th C	fe	3.9	2.5	1.2	2.5	destr.	48
5a-1	Nimrud	110	late 7th C	fe	4.2	2.5	1.2	2	destr.	48
5a-1	Nimrud	49	late 7th C	fe	4.6	2.5	1.2	3	destr.	48
5a-1	Ayanis	37	ca. 650-590	fe	4.8	2.5	1.7		destr.	48
5a-1	Nimrud	230	late 7th C	fe	4.9	2.5	1.3	3	destr.	48
5a-1	Gerar	60	?	fe	3.4	2.6	1.2			49
5a-1	Nimrud	221	late 7th C	fe	3.9	2.6	1.1	1.5	destr.	49
5a-1	Nimrud	63	late 7th C	fe	4.0	2.6	1.3	2.5	destr.	49
5a-1	Nimrud	129	late 7th C	fe	4.5	2.6	1	1.5	destr.	49
5a-1	Nimrud	72	late 7th C	fe	4.5	2.6	1.3	2.5	destr.	49
5a-1	Ayanis	5	ca. 650-590	fe	3.7	2.7	1.1		destr.	49
5a-1	Nimrud	215	late 7th C	fe	3.9	2.7	1.3	2	destr.	49
5a-1	Nimrud	220	late 7th C	fe	4.1	2.7	1.1	2	destr.	49
5a-1	Nimrud	212	late 7th C	fe	4.5	2.7	1.3	2.5	destr.	49
5a-1	Lachish	349	8th C	fe	4.6	2.7	1.3	3.6		49
5a-1	Nimrud	176	late 7th C	fe	4.6	2.7	1.4	2.5	destr.	49
5a-1	Nimrud	45	late 7th C	fe	4.7	2.7	1.1	2.5	destr.	50
5a-1	Nimrud	111	late 7th C	fe	4.9	2.7	1.2	2.5	destr.	50
5a-1	Nimrud	257	late 7th C	fe	5.0	2.7	1.1	2.5	destr.	50
5a-1	Hasanlu	11	8th C	fe	5.1	2.7	1.2		destr.	50
5a-1	Nimrud	70	late 7th C	fe	5.1	2.7	1.3	3.5	destr.	50
5a-1	Nimrud	194	late 7th C	fe	4.2	2.8	1.4	3	destr.	50
5a-1	Nimrud	106	late 7th C	fe	4.4	2.8	1.1	1.5	destr.	50
5a-1	Nimrud	96	late 7th C	fe	4.4	2.8	1.2	2.5	destr.	50
5a-1	Nimrud	94	late 7th C	fe	4.7	2.8	1.2	3	destr.	50
5a-1	Nimrud	51	late 7th C	fe	4.7	2.8	1.4	3.5	destr.	50
5a-1	Nimrud	99	late 7th C	fe	4.8	2.8	1.4	4	destr.	50
5a-1	Nimrud	196	late 7th C	fe	4.9	2.8	1.3	3	destr.	50
5a-1	Nimrud	83	late 7th C	fe	5.0	2.8	1.3	3.5	destr.	50

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5a-1	Nimrud	95	late 7th C	fe	5.0	2.8	1.5	3	destr.	51
5a-1	Nimrud	62	late 7th C	fe	4.4	2.9	1.1	2	destr.	51
5a-1	Nimrud	67	late 7th C	fe	4.5	2.9	1.1	2.5	destr.	51
5a-1	Nimrud	162	late 7th C	fe	4.5	2.9	1.3	2.5	destr.	51
5a-1	Nimrud	108	late 7th C	fe	4.7	2.9	1.2	2.5	destr.	51
5a-1	Gerar	55	?	fe	4.7	2.9	1.4			51
5a-1	Nimrud	117	late 7th C	fe	4.9	2.9	1.3	3.5	destr.	51
5a-1	Nimrud	190	late 7th C	fe	5.0	2.9	1.2	3	destr.	51
5a-1	Nimrud	66	late 7th C	fe	5.0	2.9	1.3	3	destr.	51
5a-1	Nimrud	125	late 7th C	fe	5.4	2.9	1.3	3.5	destr.	51
5a-1	Nimrud	144	late 7th C	fe	5.5	2.9	1.3	2.5	destr.	51
5a-1	Nimrud	217	late 7th C	fe	3.8	3.0	1.3	2	destr.	52
5a-1	Nimrud	214	late 7th C	fe	4.0	3.0	1.3	2.5	destr.	52
5a-1	Lachish	33	8th C	fe	4.2	3.0	1.2	3.0	cache	52
5a-1	Ayanis	8	ca. 650-590	fe	4.3	3.0	1.2		destr.	52
5a-1	Gerar	38	?	fe	4.3	3.0	1.3			52
5a-1	Nimrud	109	late 7th C	fe	4.7	3.0	1.3	2.5	destr.	52
5a-1	Nimrud	228	late 7th C	fe	4.7	3.0	1.3	2.5	destr.	52
5a-1	Nimrud	78	late 7th C	fe	4.7	3.0	1.4	2.5	destr.	52
5a-1	Nimrud	133	late 7th C	fe	5.0	3.0	1.1	3	destr.	52
5a-1	Nimrud	113	late 7th C	fe	5.0	3.0	1.2	4	destr.	52
5a-1	Nimrud	71	late 7th C	fe	5.1	3.0	1.1	3	destr.	52
5a-1	Nimrud	123	late 7th C	fe	5.2	3.0	1.2	2	destr.	53
5a-1	Nimrud	188	late 7th C	fe	5.3	3.0	1.1	3	destr.	53
5a-1	Nippur	1	NA	bz	5.3	3.0	1.2			53
5a-1	Ayanis	15	ca. 650-590	fe	5.5	3.0	1.6		destr.	53
5a-1	Nimrud	60	late 7th C	fe	4.2	3.1	1.3	2.5	destr.	53
5a-1	Nimrud	124	late 7th C	fe	4.3	3.1	1.3	2.5	destr.	53
5a-1	Sialk	61	9th-7th C	??	4.7	3.1	0.8		burial	53
5a-1	Nimrud	152	late 7th C	fe	4.7	3.1	1.3	2.5	destr.	53
5a-1	Nimrud	185	late 7th C	fe	4.8	3.1	1.1	3	destr.	53
5a-1	Nimrud	148	late 7th C	fe	4.9	3.1	1.5	3	destr.	53
5a-1	Nimrud	89	late 7th C	fe	5.0	3.1	1.3	3	destr.	53
5a-1	Nimrud	191	late 7th C	fe	5.1	3.1	1.3	3.5	destr.	54
5a-1	Nimrud	199	late 7th C	fe	5.1	3.1	1.5	3	destr.	54
5a-1	Nimrud	120	late 7th C	fe	5.1	3.1	1.7	4	destr.	54
5a-1	Nimrud	201	late 7th C	fe	5.2	3.1	1.3	3	destr.	54
5a-1	Nimrud	155	late 7th C	fe	5.2	3.1	1.4	4	destr.	54
5a-1	Nimrud	77	late 7th C	fe	5.2	3.1	1.5	4.5	destr.	54
5a-1	Nimrud	116	late 7th C	fe	5.3	3.1	1.3	3	destr.	54
5a-1	Nimrud	164	late 7th C	fe	5.3	3.1	1.3	4.5	destr.	54
5a-1	Nimrud	112	late 7th C	fe	5.6	3.1	1.2	3	destr.	54
5a-1	Nimrud	160	late 7th C	fe	4.1	3.2	1.4	3.5	destr.	54
5a-1	Nimrud	74	late 7th C	fe	4.3	3.2	1.3	2.5	destr.	54
5a-1	Nimrud	193	late 7th C	fe	4.4	3.2	1.4	2.5	destr.	54
5a-1	Nimrud	76	late 7th C	fe	5.0	3.2	1.2	4	destr.	54
5a-1	Nimrud	165	late 7th C	fe	5.1	3.2	1.3	2.5	destr.	54
5a-1	Nimrud	55	late 7th C	fe	5.2	3.2	1.3	3	destr.	55
5a-1	Nimrud	143	late 7th C	fe	5.2	3.2	1.4	3.5	destr.	55
5a-1	Nimrud	259	late 7th C	fe	5.4	3.2	1.2	25	destr.	55
5a-1	Nimrud	179	late 7th C	fe	5.4	3.2	1.4	4	destr.	55
5a-1	Hasanlu	30	8th C	fe	5.8	3.2	1.7		destr.	55
5a-1	Nimrud	177	late 7th C	fe	5.9	3.2	1.4	3	destr.	55
5a-1	Nimrud	92	late 7th C	fe	4.7	3.3	1.3	2.5	destr.	55
5a-1	Nimrud	209	late 7th C	fe	4.7	3.3	1.4	3	destr.	55
5a-1	Nimrud	132	late 7th C	fe	5.0	3.3	1.2	4	destr.	55
5a-1	Nimrud	80	late 7th C	fe	5.2	3.3	1.4	3	destr.	55

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5a-1	Nimrud	85	late 7th C	fe	5.3	3.3	1.3	4	destr.	55
5a-1	Lachish	350	8th C	fe	5.3	3.3	1.5	3.8		56
5a-1	Nimrud	93	late 7th C	fe	5.4	3.3	1.3	4.5	destr.	56
5a-1	Nimrud	169	late 7th C	fe	5.4	3.3	1.5	4	destr.	56
5a-1	Nimrud	187	late 7th C	fe	5.5	3.3	1.6	4	destr.	56
5a-1	Ayanis	7	ca. 650-590	fe	3.6	3.4	1.1		destr.	56
5a-1	Nimrud	122	late 7th C	fe	5.0	3.4	1.4	4	destr.	56
5a-1	Nimrud	207	late 7th C	fe	5.1	3.4	1.4	4	destr.	56
5a-1	Nimrud	43	late 7th C	fe	5.1	3.4	1.5	4	destr.	56
5a-1	Nimrud	173	late 7th C	fe	5.2	3.4	1.3	3	destr.	56
5a-1	Nimrud	53	late 7th C	fe	5.2	3.4	1.4	3.5	destr.	56
5a-1	Nimrud	69	late 7th C	fe	5.3	3.4	1.4	3	destr.	57
5a-1	Nimrud	97	late 7th C	fe	5.5	3.4	1.4	4	destr.	57
5a-1	Nimrud	245	NA	fe	5.5	3.4	1.4	3	cache	57
5a-1	Nimrud	59	late 7th C	fe	5.6	3.4	1.6	5	destr.	57
5a-1	Lachish	58	7th C	fe	5.7	3.4	1.1	3.2		57
5a-1	Nimrud	137	late 7th C	fe	5.7	3.4	1.4	5.5	destr.	57
5a-1	Nimrud	54	late 7th C	fe	5.7	3.4	1.5	5	destr.	57
5a-1	Nush-i Jan	1	700-500	fe	4.2	3.5	1.2			57
5a-1	Ayanis	6	ca. 650-590	fe	4.9	3.5	1.1		destr.	57
5a-1	Nimrud	68	late 7th C	fe	5.0	3.5	1.3	3.5	destr.	58
5a-1	Nimrud	42	late 7th C	fe	5.3	3.5	1.5	5	destr.	58
5a-1	Lachish	121	8th C	fe	5.3	3.5	1.9	6.7		58
5a-1	Nimrud	256	late 7th C	fe	5.5	3.5	1.5	4.5	destr.	58
5a-1	Nimrud	58	late 7th C	fe	5.6	3.5	1.4	4	destr.	58
5a-1	Nimrud	135	late 7th C	fe	5.6	3.5	1.4	3.5	destr.	58
5a-1	Nimrud	167	late 7th C	fe	5.8	3.5	1.3	3.5	destr.	58
5a-1	Nimrud	170	late 7th C	fe	5.8	3.5	1.4	4	destr.	58
5a-1	Nimrud	178	late 7th C	fe	6.3	3.5	1.4	6	destr.	58
5a-1	Nimrud	163	late 7th C	fe	5.1	3.6	1.6	4.5	destr.	58
5a-1	Nimrud	172	late 7th C	fe	5.5	3.6	1.3	2.5	destr.	58
5a-1	Lachish	309	8th C	fe	6.5	3.6	1.5	6.7		59
5a-1	Gerar	64	?	fe	7.9	3.6	1.1			59
5a-1	Carchemish	23	late 7th C	fe	4.7	3.7	1.3	4.0	destr.	59
5a-1	Ayanis	9	ca. 650-590	fe	5.4	3.7	1.6		destr.	59
5a-1	Lachish	57	8th C	fe	5.6	3.7	1.4			59
5a-1	Nimrud	140	late 7th C	fe	6.0	3.7	1.6	6	destr.	59
5a-1	Nimrud	180	late 7th C	fe	6.0	3.7	1.7	4.5	destr.	59
5a-1	Lachish	346	8th C	fe	6.1	3.7	1.6	5.5		59
5a-1	Ayanis	10	ca. 650-590	fe	6.6	3.7	1.3		destr.	60
5a-1	Nimrud	197	late 7th C	fe	5.4	3.8	1.7	3.5	destr.	60
5a-1	Nimrud	181	late 7th C	fe	5.9	3.8	1.3	3.5	destr.	60
5a-1	Lachish	130	7th C	fe	6.0	3.8	1.6	6.2		60
5a-1	Lachish	347	8th C	fe	6.0	3.8	1.6	3.9		60
5a-1	Nimrud	200	late 7th C	fe	6.4	3.8	1.1	4.5	destr.	60
5a-1	Hasanlu	66	8th C	bz	5.4	3.9	1.4		destr.	60
5a-1	Lachish	369	8th-7th C	fe	5.7	3.9	1.4	4.6	cache	61
5a-1	Nimrud	141	late 7th C	fe	6.0	3.9	1.4	4.5	destr.	61
5a-1	Nimrud	138	late 7th C	fe	6.4	3.9	1.5	5.5	destr.	61
5a-1	Lachish	317	8th C	fe	7.1	3.9	1.3	5.7		61
5a-1	Uruk	24	NB?	bz	4.6	4.0	1.6			61
5a-1	Nimrud	241	late 7th C	fe	5.1	4.0	1.8	6	destr.	61
5a-1	Lachish	338	8th C	fe	6.0	4.0	1.3	5.4		61
5a-1	Ayanis	12	ca. 650-590	fe	6.2	4.0	1.4		destr.	62
5a-1	Ayanis	20	ca. 650-590	fe	6.3	4.0	1.5		destr.	62
5a-1	Hasanlu	12	8th C	fe	6.3	4.0	1.8		destr.	62
5a-1	Lachish	318	8th C	fe	6.6	4.0	1.3	3.3		62

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5a-1	Nimrud	258	late 7th C	fe	6.7	4.0	1.5	9	destr.	62
5a-1	Lachish	56	8th C	fe	6.7	4.0	1.9			62
5a-1	Ayanis	21	ca. 650-590	fe	6.8	4.0	1.8		destr.	62
5a-1	Lachish	18	8th-7th C	fe	5.5	4.2	1.6		cache	63
5a-1	Lachish	129	8th C	fe	6.1	4.2	1.6	5.1		63
5a-1	Lachish	310	8th C	fe	6.4	4.2	1.6	5.4		63
5a-1	Lachish	6	7th C	fe	6.7	4.2	1.6		burial	63
5a-1	Lachish	322	8th C	fe	7.5	4.2	1.6	6.3		63
5a-1	Ayanis	13	ca. 650-590	fe	8.2	4.2	1.4		destr.	63
5a-1	Lachish	26	8th C	fe	5.5	4.3	1.4	4.7		63
5a-1	Hasanlu	16	8th C	fe	5.9	4.3	1.4		destr.	64
5a-1	Lachish	313	8th C	fe	5.9	4.3	1.7	5.1		64
5a-1	Nimrud	139	late 7th C	fe	6.0	4.3	1.3	4	destr.	64
5a-1	Lachish	80	8th C	cu	6.2	4.3	1.1	4.1		64
5a-1	Ayanis	19	ca. 650-590	fe	6.3	4.3	1.7		destr.	64
5a-1	Lachish	325	8th C	fe	6.6	4.3	1.6	5.5		64
5a-1	Lachish	13	8th C	fe	6.6	4.3	1.7		destr?	65
5a-1	Gerar	52	?	fe	6.7	4.3	1.7			65
5a-1	Lachish	323	7th C	fe	6.9	4.3	1.6	6.4		65
5a-1	Toprakkale	13	ca. 650-590	fe	7.3	4.3	1.6			65
5a-1	Lachish	54	8th C	fe	5.9	4.4	1.7			65
5a-1	Lachish	34	7th C?	fe	6.5	4.4	1.8	8.0		65
5a-1	Uruk	3	NB	fe	6.7	4.4	2.7		burial	65
5a-1	Ayanis	17	ca. 650-590	fe	5.6	4.5	1.7		destr.	66
5a-1	Lachish	329	8th C	fe	6.0	4.5	1.7	6.8		66
5a-1	Ayanis	14	ca. 650-590	fe	6.2	4.5	1.6		destr.	66
5a-1	Lachish	308	8th C	fe	6.3	4.5	1.6	6.6		66
5a-1	Lachish	31	8th C	fe	6.5	4.5	1.8	6.9	cache	66
5a-1	Lachish	269	8th C	fe	7.0	4.5	1.6	8.1		67
5a-1	Lachish	274	8th C	fe	7.0	4.5	1.6	6.9		67
5a-1	Lachish	4	7th C	fe	7.1	4.5	1.6		burial	67
5a-1	Lachish	59	7th C	fe	7.3	4.5	1.6	8.8		67
5a-1	Lachish	324	8th C	fe	7.3	4.5	1.7	9.3		67
5a-1	Lachish	303	8th C	fe	7.3	4.5	1.8	6.2		68
5a-1	Lachish	321	8th C	fe	7.5	4.5	1.6	5.7		68
5a-1!	Fakhariya	15	Iron Age	bz	7.9	4.5	1.4			68
5a-1	Lachish	35	8th C	fe	5.5	4.6	1.3			68
5a-1	Lachish	23	7th C	fe	6.7	4.6	1.7		destr	68
5a-1	Lachish	305	8th C	fe	7.0	4.6	1.7	7.5		69
5a-1	Lachish	272	8th C	fe	7.1	4.6	1.7	8.0		69
5a-1	Sialk	60	9th-7th C	??	7.2	4.6	1.3		burial	69
5a-1	Sialk	29	9th-7th C	fe	5.4	4.7	1.2		burial	69
5a-1	Lachish	341	7th C	fe	6.3	4.7	1.2	4.6		69
5a-1	Hasanlu	29	8th C	fe	6.3	4.7	1.9		destr.	69
5a-1	Lachish	306	8th C	fe	6.5	4.7	1.9	6.1		70
5a-1	Lachish	22	7th C	fe	6.6	4.7	1.9		destr	70
5a-1	Lachish	254	8th C	fe	7.0	4.7	1.9	8.7		70
5a-1	Lachish	270	8th C	fe	7.3	4.7	1.8	9.9		70
5a-1	Lachish	14	8th-7th C	fe	7.4	4.7	1.6		cache	70
5a-1	Lachish	255	8th C	fe	7.5	4.7	1.6	7.9		70
5a-1	Ayanis	35	ca. 650-590	fe	8.7	4.7	1.8		destr.	71
5a-1	Lachish	345	8th C	fe	6.0	4.8	1.8	7.4		71
5a-1	Lachish	24	7th C	fe	7.0	4.8	1.7	8.1	destr	71
5a-1	Lachish	363	8th-7th C	fe	7.0	4.8	1.8	9.2	cache	71
5a-1	Lachish	273	8th C	fe	7.3	4.8	1.8	8.0		72
5a-1	Lachish	264	8th C	fe	7.9	4.8	1.7	11.3		72
5a-1	Gerar	49	?	fe	5.8	4.9	1.5			72

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5a-1	Ayanis	38	ca. 650-590	fe	7.1	4.9	1.8		destr.	72
5a-1	Lachish	53	8th C	fe	7.5	4.9	2.0	12.4		72
5a-1	Lachish	256	8th C	fe	7.7	4.9	1.6	7.9		73
5a-1	Ayanis	22	ca. 650-590	fe	5.4	5.0	1.5		destr.	73
5a-1	Gerar	48	?	fe	5.9	5.0	1.8			73
5a-1	Ayanis	18	ca. 650-590	fe	6.1	5.0	1.5		destr.	73
5a-1	Lachish	188	8th C	fe	7.2	5.0	1.5	10.6		73
5a-1	Lachish	330	8th C	fe	7.3	5.0	1.7	7.1		73
5a-1	Lachish	234	8th C	fe	7.4	5.0	1.9	9.6		74
5a-1	Lachish	271	8th C	fe	7.4	5.0	1.9	10.1		74
5a-1	Lachish	47	8th C	fe	7.5	5.0	1.3			74
5a-1	Ayanis	23	ca. 650-590	fe	7.6	5.0	1.6		destr.	74
5a-1	Hasanlu	24	8th C	fe	8.0	5.0	1.8		destr.	74
5a-1	Lachish	235	8th C	fe	7.7	5.1	1.8	6.9		75
5a-1	Lachish	40	8th C	fe	6.1	5.2	2.1			75
5a-1	Lachish	197	8th C	fe	6.5	5.2	1.5	8.8		75
5a-1	Lachish	198	8th C	fe	7.0	5.2	1.5	6.1		75
5a-1	Lachish	194	8th C	fe	7.2	5.2	1.4	6.2		75
5a-1	Sialk	24	9th-7th C	fe	7.5	5.2	2.2		burial	75
5a-1	Gerar	63	?	fe	8.0	5.2	1.1			76
5a-1	Gerar	81	?	fe	8.0	5.2	1.6			76
5a-1	Lachish	257	8th C	fe	8.1	5.2	1.8	9.2		76
5a-1	Sialk	54	9th-7th C	bz	8.4	5.2	1.6		burial	76
5a-1	Lachish	45	8th C	fe	6.3	5.3	1.9			76
5a-1	Gerar	45	?	fe	7.3	5.3	1.2			76
5a-1	Lachish	16	8th-7th C	fe	7.3	5.3	2.0	7.4	cache	76
5a-1	Gerar	62	?	fe	8.6	5.3	1.2			77
5a-1	Lachish	212	8th C	fe	6.7	5.4	1.6	7.9		77
5a-1	Lachish	132	8th C	fe	7.4	5.4	1.5	5.5		77
5a-1	Lachish	240	8th C	fe	7.8	5.4	1.7	8.3		77
5a-1	Lachish	241	8th C	fe	7.8	5.4	1.8	8.2		77
5a-1	Sialk	30	9th-7th C	?	7.8	5.4	2.0		burial	77
5a-1	Lachish	30	8th C	fe	7.8	5.4	2.0		cache	78
5a-1	Lachish	15	8th-7th C	fe	8.3	5.4	1.5		cache	78
5a-1	Sialk	15	9th-7th C	fe	8.6	5.4	2.3		burial	78
5a-1	Gerar	83	?	fe	6.9	5.5	1.5			78
5a-1	Hasanlu	57	8th C	bz	7.2	5.5	1.8		destr.	78
5a-1	Lachish	370	8th-7th C	fe	7.3	5.5	1.5	6.4	cache	78
5a-1	Sultantepe	2	late NA?	fe	7.6	5.5	1.7		destr.	78
5a-1	Lachish	27	8th C?	bz	6.0	5.6	1.9			79
5a-1	Lachish	5	7th C	fe	6.6	5.6	1.3		burial	79
5a-1	Lachish	189	8th C	fe	7.3	5.6	1.6	9.4		79
5a-1	Lachish	9	9th-7th C	fe	6.9	5.7	1.4		burial	79
5a-1	Gerar	47	?	fe	6.8	5.8	1.7			79
5a-1	Lachish	64	7th C	fe	7.6	5.8	1.8			79
5a-1	Sialk	31	9th-7th C	?	7.9	5.8	1.9		burial	79
5a-1	Sialk	39	9th-7th C	bz	8.2	5.8	1.9		burial	79
5a-1	Lachish	360	8th-7th C	fe	8.3	5.8	1.5	9.5	cache	80
5a-1	Lachish	2	7th C	?	8.6	5.8	1.9		burial	80
5a-1	Lachish	357	7th C	fe	9.0	5.8	1.4	14.3		80
5a-1	Lachish	195	8th C	fe	7.3	5.9	1.3	9.3		80
5a-1	Lachish	60	7th C	fe	8.2	5.9	1.3			80
5a-1	Lachish	356	7th C	fe	8.9	5.9	1.7	15.6		80
5a-1	Lachish	29	8th C	fe	9.0	5.9	2.2	13.4	cache	81
5a-1	Lachish	190	8th C	fe	7.9	6.0	1.4	6.6		81
5a-1	Ayanis	34	ca. 650-590	fe	10.3	6.0	1.8		destr.	81
5a-1	Lachish	51	8th C	fe	7.5	6.1	1.6			81

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5a-1	Lachish	48	8th C	fe	9.7	6.1	2.3	15.4		81
5a-1	Gerar	46	?	fe	7.7	6.2	1.8			82
5a-1	Sialk	37	9th-7th C	bz	9.5	6.2	2.0		burial	82
5a-1	Lachish	147	8th C	fe	9.4	6.4	1.7	9.9		82
5a-1	Lachish	43	8th C	fe	9.6	6.4	1.8	17.5		82
5a-1	Lachish	55	8th C	fe	9.0	6.5	1.9	12.4		82
5a-1	Sialk	13	9th-7th C	fe	9.0	6.5	2.3		burial	82
5a-1	Sialk	14	9th-7th C	fe	9.1	6.5	2.3		burial	83
5a-1	Gerar	7	?	fe	12.4	6.5	2.0			83
5a-1	Lachish	63	7th C	fe	9.0	6.6	1.5			83
5a-1	Sialk	23	9th-7th C	fe	9.6	6.6	2.2		burial	83
5a-1	Lachish	173	8th C	fe	8.4	6.7	1.3	7.5		83
5a-1	Gerar	40	?	fe	9.0	6.7	1.4			84
5a-1	Sialk	40	9th-7th C	bz	8.8	6.8	1.7		burial	84
5a-1	Gerar	41	?	fe	9.0	6.8	1.3			84
5a-1	Sialk	44	9th-7th C	bz	10.4	6.8	2.0		burial	84
5a-1	Sialk	12	9th-7th C	fe	10.8	6.8	2.2		burial	85
5a-1	Gerar	53	?	fe	9.6	6.9	1.0			85
5a-1	Sialk	28	9th-7th C	fe	8.5	7.1	2.0		burial	85
5a-1	Lachish	61	7th C	fe	8.6	7.1	2.3	17.4		85
5a-1	Lachish	1	7th C	fe	8.5	7.2	1.5		burial	85
5a-1	Lachish	103	8th C	fe	9.4	7.3	1.4	10.6		85
5a-1	Hasanlu	4	8th C	fe	9.9	7.3	1.8		destr.	85
5a-1	Lachish	353	8th C	fe	8.8	7.5	1.2	8.9		86
5a-1	Sialk	57	9th-7th C	??	10.0	7.5	2.1		burial	86
5a-1	Sialk	10	9th-7th C	fe	11.0	7.5	2.6		burial	86
5a-1	Sialk	11	9th-7th C	fe	10.8	7.6	2.4		burial	86
5a-1	Lachish	28	8th C	fe	10.8	8.0	1.6		cache	86
5a-1	Lachish	52	8th C	fe	10.4	8.1	1.6			86
5a-1!	Nush-i Jan	11	700-500	bz	11.3	8.2	1.9			87
5a-1	Sialk	8	9th-7th C	fe	13.8	8.5	2.8		burial	87
5a-1	Carchemish	40	late 7th-early 6th C	fe	?	?	?		destr.	87
5a-1	Gerar	3	?	bz	3.3	1.8*	1.1			88
5a-1	Nimrud	205	late 7th C	fe	4.1	1.8*	1	2.5	destr.	88
5a-1	Nimrud	219	late 7th C	fe	4.2	1.9*	1.1	2.5	destr.	88
5a-1	Nimrud	127	late 7th C	fe	4.0	2.0*	1.1	1.5	destr.	88
5a-1	Nimrud	249	NA	fe	3.6	2.1*	1.1	20	cache	88
5a-1	Nimrud	65	late 7th C	fe	3.7	2.1*	1.2	2	destr.	88
5a-1	Nimrud	195	late 7th C	fe	3.3	2.2*	1.2	2	destr.	88
5a-1	Nimrud	216	late 7th C	fe	4.3	2.2*	1.1	3	destr.	88
5a-1	Nimrud	75	late 7th C	fe	4.4	2.2*	1.1	1.5	destr.	88
5a-1	Nimrud	189	late 7th C	fe	4.8	2.2*	1.6	4	destr.	88
5a-1	Nimrud	131	late 7th C	fe	4.2	2.3*	1.3	2	destr.	88
5a-1	Nimrud	107	late 7th C	fe	4.3	2.3*	1.2	2.5	destr.	88
5a-1	Nimrud	61	late 7th C	fe	4.5	2.3*	1.3	3	destr.	88
5a-1	Nimrud	79	late 7th C	fe	4.5	2.3*	1.5	3.5	destr.	88
5a-1	Nimrud	174	late 7th C	fe	4.6	2.3*	1.2	2.5	destr.	89
5a-1	Nimrud	192	late 7th C	fe	4.6	2.3*	1.3	3	destr.	89
5a-1	Hasanlu	27	8th C	fe	5.2	2.3*	1.7		destr.	89
5a-1	Nimrud	128	late 7th C	fe	4.4	2.4*	1.1	2.5	destr.	89
5a-1	Nimrud	208	late 7th C	fe	4.4	2.4*	1.4	3	destr.	89
5a-1	Nimrud	224	late 7th C	fe	4.5	2.4*	1.1	2	destr.	89
5a-1	Nimrud	204	late 7th C	fe	4.5	2.4*	1.3	2.5	destr.	89
5a-1	Nimrud	158	late 7th C	fe	4.6	2.4*	1.5	4	destr.	89
5a-1	Nimrud	81	late 7th C	fe	5.4	2.4*	1.3	3.5	destr.	89
5a-1	Nimrud	213	late 7th C	fe	3.9	2.5*	1.2	1.5	destr.	89
5a-1	Nimrud	203	late 7th C	fe	4.0	2.5*	1.1	2.5	destr.	89

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5a-1	Nimrud	223	late 7th C	fe	4.4	2.5*	1.1	2	destr.	89
5a-1	Nimrud	103	late 7th C	fe	4.5	2.5*	1.2	2	destr.	89
5a-1	Nimrud	227	late 7th C	fe	4.5	2.5*	1.3	2.5	destr.	90
5a-1	Nimrud	47	late 7th C	fe	4.6	2.5*	1.2	3	destr.	90
5a-1	Nimrud	154	late 7th C	fe	4.6	2.5*	1.3	3	destr.	90
5a-1	Nimrud	121	late 7th C	fe	5.1	2.5*	1.5	3	destr.	90
5a-1	Nimrud	101	late 7th C	fe	3.7	2.6*	1.3	2.5	destr.	90
5a-1	Nimrud	104	late 7th C	fe	4.3	2.6*	1.1	2	destr.	90
5a-1	Nimrud	82	late 7th C	fe	4.5	2.6*	1.3	2.5	destr.	90
5a-1	Nimrud	202	late 7th C	fe	4.6	2.6*	1.3	2.5	destr.	90
5a-1	Nimrud	147	late 7th C	fe	4.7	2.6*	1.3	4	destr.	90
5a-1	Nimrud	159	late 7th C	fe	4.7	2.6*	1.3	2	destr.	90
5a-1	Nimrud	119	late 7th C	fe	4.8	2.6*	1.3	3	destr.	90
5a-1	Nimrud	229	late 7th C	fe	4.8	2.6*	1.3	2	destr.	90
5a-1	Nimrud	247	NA	fe	5.0	2.6*	1.3	3	cache	90
5a-1	Nimrud	48	late 7th C	fe	5.1	2.6*	1.5	3.5	destr.	90
5a-1	Nimrud	171	late 7th C	fe	5.2	2.6*	1.3	3	destr.	91
5a-1	Nimrud	226	late 7th C	fe	4.3	2.7*	1.2	2.5	destr.	91
5a-1	Gerar	43	?	fe	4.4	2.7*	1.1			91
5a-1	Nimrud	182	late 7th C	fe	4.4	2.7*	1.2	2.5	destr.	91
5a-1	Nimrud	261	late 7th C	fe	4.5	2.7*	1.1	2.5	destr.	91
5a-1	Nimrud	64	late 7th C	fe	4.6	2.7*	1.2	4	destr.	91
5a-1	Nimrud	175	late 7th C	fe	4.8	2.7*	1.4	3	destr.	91
5a-1	Nimrud	56	late 7th C	fe	5.0	2.7*	1.2	2.5	destr.	91
5a-1	Nimrud	218	late 7th C	fe	3.2	2.8*	1.2	2.5	destr.	91
5a-1	Nimrud	149	late 7th C	fe	3.9	2.8*	1.2	2.5	destr.	91
5a-1	Nimrud	105	late 7th C	fe	4.7	2.8*	1	1.5	destr.	91
5a-1	Nimrud	248	NA	fe	4.7	2.8*	1.2	2.5	cache	91
5a-1	Nimrud	206	late 7th C	fe	4.8	2.8*	1.2	3	destr.	91
5a-1	Nimrud	184	late 7th C	fe	4.8	2.8*	1.3	2.5	destr.	91
5a-1	Nimrud	118	late 7th C	fe	4.8	2.8*	1.6	5.5	destr.	92
5a-1	Nimrud	91	late 7th C	fe	4.9	2.8*	1.5	4	destr.	92
5a-1	Nimrud	222	late 7th C	fe	5.0	2.8*	1.3	2.5	destr.	92
5a-1	Nimrud	134	late 7th C	fe	5.1	2.8*	1.4	3.5	destr.	92
5a-1	Nimrud	46	late 7th C	fe	6.0	2.8*	1.5	3.5	destr.	92
5a-1	Nimrud	73	late 7th C	fe	4.7	2.9*	1.2	3.5	destr.	92
5a-1	Nimrud	115	late 7th C	fe	5.0	2.9*	1.3	3.5	destr.	92
5a-1	Nimrud	153	late 7th C	fe	5.0	2.9*	1.3	3.5	destr.	92
5a-1	Nimrud	183	late 7th C	fe	5.0	2.9*	1.3	3.5	destr.	92
5a-1	Nimrud	126	late 7th C	fe	5.1	2.9*	1.2	2.5	destr.	92
5a-1	Nimrud	86	late 7th C	fe	5.1	2.9*	1.3	3.5	destr.	92
5a-1	Nimrud	52	late 7th C	fe	5.1	2.9*	1.5	3	destr.	92
5a-1	Nimrud	136	late 7th C	fe	5.2	2.9*	1.3	3	destr.	92
5a-1	Nimrud	168	late 7th C	fe	5.3	2.9*	1.2	3.5	destr.	92
5a-1	Nimrud	44	late 7th C	fe	5.3	2.9*	1.3	3	destr.	93
5a-1	Nimrud	246	NA	fe	5.3	2.9*	1.3	4	cache	93
5a-1	Nimrud	211	late 7th C	fe	3.9	3.0*	1.3	3.5	destr.	93
5a-1	Nimrud	84	late 7th C	fe	4.7	3.0*	1.3	2.5	destr.	93
5a-1	Nimrud	146	late 7th C	fe	4.8	3.0*	1.4	2.5	destr.	93
5a-1	Nimrud	57	late 7th C	fe	4.8	3.0*	1.5	4.5	destr.	93
5a-1	Ayanis	36	ca. 650-590	fe	4.8	3.0*	1.6		destr.	93
5a-1	Nimrud	142	late 7th C	fe	5.0	3.0*	1.4	3.5	destr.	93
5a-1	Nimrud	50	late 7th C	fe	5.1	3.0*	1.3	4	destr.	93
5a-1	Nimrud	114	late 7th C	fe	5.2	3.0*	1.4	3.5	destr.	93
5a-1	Nimrud	186	late 7th C	fe	5.4	3.0*	1.4	4	destr.	93
5a-1	Nimrud	157	late 7th C	fe	4.6	3.1*	1.3	2.5	destr.	93
5a-1	Nimrud	151	late 7th C	fe	4.9	3.1*	1.4	3	destr.	94

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5a-1	Nimrud	98	late 7th C	fe	5.0	3.1*	1.4	3.5	destr.	94
5a-1	Nimrud	156	late 7th C	fe	5.1	3.1*	1.3	3.5	destr.	94
5a-1	Nimrud	88	late 7th C	fe	5.3	3.1*	1.3	4	destr.	94
5a-1	Nimrud	161	late 7th C	fe	5.4	3.1*	1.4	4.5	destr.	94
5a-1	Nimrud	198	late 7th C	fe	6.0	3.1*	1.6	5	destr.	94
5a-1	Nimrud	150	late 7th C	fe	5.0	3.2*	1.5	3	destr.	94
5a-1	Nimrud	210	late 7th C	fe	4.8	3.3*	1.6	3.5	destr.	94
5a-1	Nimrud	145	late 7th C	fe	5.1	3.3*	1.3	3	destr.	94
5a-1	Nimrud	90	late 7th C	fe	5.3	3.3*	1.3	3.5	destr.	94
5a-1	Nimrud	87	late 7th C	fe	6.2	3.3*	1.5	3.5	destr.	94
5a-1	Carchemish	22	late 7th C	fe	6.1	3.4*	1.8	7.5	destr.	94
5a-1	Nimrud	254	late 7th C	fe	5.0	3.5*	1.7	8	destr.	94
5a-1	Hasanlu	67	8th C	bz	6.2	3.5*	1.3		destr.	95
5a-1	Nimrud	100	late 7th C	fe	5.6	3.6*	1.3	4	destr.	95
5a-1	Gerar	59	?	fe	3.7	3.7*	1.1			95
5a-1	Nimrud	166	late 7th C	fe	4.7	3.8*	1.4	4	destr.	95
5a-1	Gerar	42	?	fe	6.8	3.8*	1.3			95
5a-1	Lachish	344	8th C	fe	5.9	3.9*	1.8	6.9		95
5a-1	Nimrud	255	late 7th C	fe	6.4	3.9*	1.5	5	destr.	95
5a-1	Lachish	340	8th C	fe	6.0	4.0*	1.3	5.6		95
5a-1	Lachish	19	8th-7th C	fe	4.6	4.0?	1.8		cache	96
5a-1	Lachish	125	7th C?	fe	7.1	4.1*	1.7	7.7		96
5a-1	Nimrud	253	late 7th C	fe	6.6	4.3*	1.7	13	destr.	96
5a-1	Lachish	65	10th C	fe	6.6	4.3*	1.9	9.1		96
5a-1	Lachish	368	8th-7th C	fe	5.7	4.4*	1.6	8.0	cache	96
5a-1	Lachish	262	7th C	fe	7.3	4.5*	2.2	11.5		96
5a-1	Lachish	124	8th C	fe	6.7	4.6*	1.8	8.4		97
5a-1	Gerar	56	?	fe	6.9	4.7*	1.4			97
5a-1	Lachish	46	8th C	fe	6.3	4.8*	1.7			97
5a-1	Gerar	50	?	fe	4.9	4.9*	1.6			97
5a-1	Gerar	70	?	fe	6.1	5.0*	2.3			97
5a-1	Gerar	73	?	fe	6.2	5.7*	1.9			97
5a-1	Lachish	49	8th C	fe	7.3	6.0?	1.4			97
5a-1	Gerar	39	?	fe	10.1	6.4?	1.5			97
5a-1	Lachish	41	8th C	fe	6.8	6.8*	1.4			97
5a-1	Gerar	58	?	fe	8.7	7.3?	4.4			98
5a-1?	Carchemish	27	late 7th C	fe	5.0	3.2	1.4	5.0	destr.	98
5a-1?	Lachish	335	8th C	fe	5.7	3.5	1.1	4.6		98
5a-1?	Nimrud	242	late 7th C	fe	4.4	3.6	1.6	4	destr.	98
5a-1?	Hasanlu	33	8th C	fe	4.9	3.8	1.2		destr.	98
5a-1?	Bastam	17	ca. 650	fe	4.0	3.9	1.6		destr.	98
5a-1?	Bastam	6	ca. 650	fe	4.4	3.9	1.6		destr.	98
5a-1?	Nimrud	260	late 7th C	fe	5.0	3.9	1.7	7.5	destr.	98
5a-1?	Uruk	11	NB	fe	6.6	3.9	1.8		burial	99
5a-1?	Lachish	50	8th C	fe	5.4	4.2	1.6			99
5a-1?	Lachish	367	8th-7th C	fe	5.4	4.4	1.7	5.0	cache	99
5a-1?	Bastam	9	UR	fe	6.5	4.5	1.4*			99
5a-1?	Lachish	42	8th C	fe	5.3	4.8	2.0			99
5a-1?	Lachish	206	8th C	fe	5.4	5.0	0.9	3.0		100
5a-1?	Lachish	175	8th C	fe	7.1	5.4	1.1	4.4		100
5a-1?	Lachish	93	8th C	fe	7.2	5.8	1.5	12.0		100
5a-1?	Lachish	72	8th C	fe	8.2	6.0	1.4	8.9		100
5a-1?	Lachish	355	8th-7th C	fe	7.7	6.4	1.6	6.5	cache	101
5a-1?	Gerar	71	?	fe	7.5	7.3	1.5			101
5a-1?	Nush-i Jan	10	700-500	bz	2.8	1.5*	1.1			101
5a-1?	Hasanlu	31	8th C	fe	6.6	2.5*	1.6		destr.	101
5a-1?	Bastam	12	UR	fe	4.0	3.0*	2.2*			101

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5a-1?	Lachish	362	7th C	fe	7.0	4.9*	2.2	8.2		102
5a-1?	Gerar	44	?	bz	8.4	8.4*	1.9			102
5a-2	Gerar	61	?	fe	4.9	4.0	1.7			102
5a-2	Hasanlu	10	8th C	fe	7.8	4.2	2.4		destr.	102
5a-2	Lachish	176	8th C	fe	7.6	4.9	1.4	4.0		102
5a-2	Hasanlu	8	8th C	fe	7.5	5.0	1.9		destr.	103
5a-2	Hasanlu	7	8th C	fe	6.0	5.3	2.2		destr.	103
5a-2	Lachish	216	8th C	fe	6.6	5.6	1.6	5.4		103
5a-2	Sialk	56	9th-7th C	bz	8.9	5.7	1.7		burial	103
5a-2	Sialk	34	9th-7th C	?	7.6	5.8	1.7		burial	103
5a-2	Hasanlu	6	8th C	fe	7.2	6.0	1.9		destr.	104
5a-2	Lachish	191	8th C	fe	8.5	6.0	1.5	10.1		104
5a-2	Sialk	53	9th-7th C	bz	10.8	6.6	2.1		burial	104
5a-2	Sialk	18	9th-7th C	bz	9.8	6.7	2.3		burial	104
5a-2	Gerar	57	?	fe	7.9	7.3	1.4			104
5a-2	Hasanlu	5	8th C	fe	8.2	7.3	2.2		destr.	104
5a-2	Sialk	22	9th-7th C	bz	11.6	7.4	3.5		burial	105
5a-2	Hasanlu	3	8th C	fe	9.5	8.2	2.0		destr.	105
5a-2	Hasanlu	2	8th C	fe	9.7	8.2	2.2		destr.	106
5a-2	Hasanlu	1	8th C	fe	10.6	8.2	2.0		destr.	106
5a-2?	Nush-i Jan	3	700-500	fe	3.8	2.1*	1.9			106
5a-3	Bastam	4	UR	bz	4.6	1.6	1.3			107
5a-3	Gerar	54	?	fe	8.4	7.1	2.3			107
5a-3	Sialk	55	9th-7th C	bz	11.9	7.8	2.5		burial	107
5a-3	Sialk	48	9th-7th C	bz	11.9	8.0	2.8		burial	107
5a-3	Sialk	16	9th-7th C	bz	14.7	6.5*	3.8		burial	108
5a-3?	Marlik	40	1450-850	bz	3.9	3.3	1.4		burial	108
5a-3?	Hasanlu	15	8th C	fe	5.2	4.3	1.5		destr.	108
5a-3?	Carchemish	36	late 7th C	fe	7.1	6.0*	3.3		destr.	108
5a-4	Ayanis	11	ca. 650-590	fe	6.2	4.0	1.3		destr.	109
5a-4	Hasanlu	17	8th C	fe	6.2	4.4	1.2		destr.	109
5a-4	Marlik	32	1450-950	bz	7.5	6.6	3.0		burial	109
5a-4	Sialk	36	9th-7th C		14.6	11.2	3.1		burial	109
5a-4?	Sialk	35	9th-7th C	fe	7.3	4.6	1.9		burial	109
5a-5	Fakhariya	13	Iron Age	bz	6.8	2.7	1.5			110
5a-5	Hasanlu	64	8th C	bz	7.9	4.0	1.7		destr.	110
5a-5	Hasanlu	40	8th C	fe	7.9	5.7	2.2		destr.	110
5a-9	Marlik	8	1550-950	bz	6.3	6.0	3.7		burial	110
5a-9?	Hasanlu	42	8th C	fe	4.7	4.7	1.9		destr.	110
5a-10	Lachish	7	7th C	fe	6.5	5.8	1.6		burial	111
5a-14	Gerar	84	?	fe	5.1	4.4*	1.6			111
5a-14?	Gerar	74	?	fe	7.8	6.4*	1.9			111
5a-19	Hasanlu	9	8th C	fe	8.2	5.4	1.6		destr.	111
5a-21	Nush-i Jan	9	700-500	bz	2.5	1.5	1.0			111
5a-21	Nush-i Jan	7	700-500	bz	3.6	2.6	1.2			111
5a-28	Fakhariya	3	NA	bz	10.1	6.0			burial	112
5a-28	Fakhariya	4	NA	bz	10.6	6.7	2.1		burial	112
5a-28	Fakhariya	5	NA	bz	8.2	6.9	2.0		burial	112
5a-28	Fakhariya	2	NA	bz	8.2	7.2	2.3		burial	112
5a-28	Fakhariya	1	NA	bz	11.3	8.4	2.4		burial	112
5a-28?	Lachish	87	9th C	fe	6.0	3.8*	1.1	5.1		112
5a-30!	Lachish	8	7th C	fe	5.4	2.9	2.0		burial	113
5a-41	Gerar	80	?	fe	8.5	8.1*	3.9			113
5a-49	Sialk	79	9th-7th C	??	8.5	4.9	2.3		burial	113
5b-1	Lachish	352	8th C	fe	3.9	2.2	0.9	2.9		114
5b-1!	Lachish	32	8th C	fe	4.6	2.6	1.7	6.9	cache	114

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5b-1	Lachish	348	8th C	fe	5.2	2.8	1.5	4.9		114
5b-1	Uruk	13	NB	bz	6.0	2.8	1.7		destr?	114
5b-1	Lachish	351	8th C	fe	5.1	3.0	1.3	3.8		114
5b-1	Lachish	298	8th C	fe	5.6	3.1	1.6	6.1		114
5b-1	Gerar	82	?	fe	5.5	3.2	1.4			114
5b-1	Lachish	316	8th C	fe	5.7	3.2	1.5	7.0		114
5b-1	Nimrud	18	late 7th C	fe	5.6	3.3	1.3	4.5	destr.	114
5b-1	Nimrud	21	late 7th C	fe	5.8	3.3	1.4	4.5	destr.	114
5b-1!	Ayanis	68	ca. 650-590	fe	8.3	3.3	1.7		destr.	114
5b-1	Lachish	79	9th C	cu	5.5	3.4	1.4	5.5		115
5b-1	Hasanlu	32	8th C	fe	6.0	3.4	1.2		destr.	115
5b-1	Nimrud	17	late 7th C	fe	6.0	3.4	1.4	4	destr.	115
5b-1	Lachish	301	8th C	fe	6.5	3.4	1.7	9.4		115
5b-1	Carchemish	30	late 7th C	fe	6.8	3.4	1.8	9.0	destr.	115
5b-1	Nimrud	25	late 7th C	fe	4,9	3.4	1.8	7	destr.	116
5b-1	Nimrud	24	late 7th C	fe	5.7	3.5	1.6	6.5	destr.	116
5b-1	Nimrud	5	late 7th C	fe	6.3	3.5	1.6	7.5	destr.	116
5b-1	Lachish	287	8th C	fe	8.3	3.5	1.1	12.0		116
5b-1	Bastam	20	UR	fe	4.3	3.6	1.5			116
5b-1	Nimrud	237	late 7th C	fe	8.0	3.6	1.4	10	destr.	116
5b-1	Lachish	314	8th C	fe	5.5	3.7	1.5	5.3		116
5b-1	Lachish	343	8th C	fe	5.8	3.7	1.2	4.6		117
5b-1	Lachish	37	8th C	bz	6.5	3.7	1.0		destr.	117
5b-1	Nimrud	36	late 7th C	fe	6.5	3.7	1.6	6	destr.	117
5b-1	Toprakkale	9	ca. 650-590	fe	6.6	3.7	1.9			117
5b-1	Lachish	337		fe	5.7	3.8	1.2	3.8		117
5b-1	Uruk	2	NB	fe	6.0	3.8	2.0		burial	117
5b-1	Nimrud	37	late 7th C	fe	6.3	3.8	1.4	5	destr.	117
5b-1	Lachish	285	8th C	fe	7.3	3.8	1.8	8.3		117
5b-1	Uruk	5	NB	fe	8.3	3.8	2.3		burial	118
5b-1	Nimrud	8	late 7th C	fe	6.3	3.9	1.7	9	destr.	118
5b-1	Lachish	283	8th C	fe	7.2	3.9	1.4	9.2		118
5b-1	Lachish	315	8th C	fe	5.6	4.0	1.5	6.1		118
5b-1	Lachish	326	8th C	fe	6.5	4.0	1.4	6.2		118
5b-1	Nimrud	1	late 7th C	fe	6.8	4.0	1.6	9.5	destr.	118
5b-1	Lachish	358	7th C	fe	6.8	4.0	1.7	9.3	destr	119
5b-1	Nimrud	39	late 7th C	fe	7.1	4.0	1.5	6.5	destr.	119
5b-1	Uruk	1	NB	fe	7.3	4.0	2.0		burial	119
5b-1	Lachish	339	8th C	fe	6.1	4.1	1.5	6.8		119
5b-1	Lachish	328	8th C	fe	6.2	4.1	1.3	8.2		119
5b-1	Lachish	126	8th C	fe	6.6	4.1	1.7	9.3		119
5b-1	Hasanlu	25	8th C	fe	6.8	4.1	1.7		destr.	119
5b-1	Lachish	300	8th C	fe	7.0	4.1	1.9	8.6		120
5b-1	Lachish	284	8th C	fe	8.1	4.1	1.6	9.8		120
5b-1	Lachish	336	8th C	fe	6.2	4.2	1.3	3.1		120
5b-1	Lachish	312	8th C	fe	6.5	4.2	1.5	4.7		120
5b-1	Lachish	128	8th C	fe	6.5	4.2	1.6			120
5b-1	Lachish	282	8th C	fe	6.5	4.2	1.7	10.4		121
5b-1	Lachish	299	8th C	fe	6.5	4.2	2.0	8.3		121
5b-1	Lachish	297	8th C	fe	6.7	4.2	1.6	6.2		121
5b-1	Lachish	319	8th C	fe	6.9	4.2	1.5	8.0		121
5b-1	Nimrud	7	late 7th C	fe	6.9	4.2	1.7	11	destr.	121
5b-1	Hasanlu	28	8th C	fe	7.0	4.2	1.6		destr.	122
5b-1	Lachish	280	8th C	fe	8.2	4.2	1.5	10.3		122
5b-1	Sialk	47	9th-7th C	bz	10.4	4.2	1.8		burial	122
5b-1	Lachish	127	8th C	fe	6.8	4.3	1.6	8.4		122
5b-1	Gerar	85	?	fe	7.3	4.3	1.5			122

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5b-1	Nimrud	2	late 7th C	fe	7.4	4.3	1.7	11	destr.	122
5b-1	Nimrud	231	late 7th C	fe	7.8	4.3	1.7	13	destr.	122
5b-1	Nimrud	9	late 7th C	fe	6.0	4.4	1.8	11	destr.	123
5b-1	Lachish	342	8th C	fe	6.1	4.4	1.5	7.2		123
5b-1	Lachish	268	8th C	fe	6.2	4.4	1.7	6.3		123
5b-1	Lachish	304	8th C	fe	6.5	4.4	1.8	6.7		123
5b-1	Lachish	307	8th C	fe	6.6	4.4	1.7	9.0		123
5b-1	Lachish	366	8th-7th C	fe	7.0	4.4	1.6	6.4	cache	124
5b-1	Lachish	286	8th C	fe	7.1	4.4	1.8	8.0		124
5b-1	Lachish	302	8th C	fe	7.3	4.4	1.9	10.8		124
5b-1	Lachish	320	7th C	fe	7.4	4.4	1.6	8.4		124
5b-1	Lachish	281	8th C	fe	8.1	4.4	1.6	8.6		125
5b-1	Lachish	116	8th C	fe	8.7	4.4	1.8	11.2		125
5b-1	Lachish	332	8th C	fe	6.3	4.5	1.6	7.0		125
5b-1	Lachish	334	8th C	fe	6.3	4.5	1.7	7.9		125
5b-1	Lachish	244	8th C	fe	6.7	4.5	1.9	8.0		126
5b-1	Lachish	115	8th C	fe	7.3	4.5	2.0	9.8		126
5b-1	Lachish	230	8th C	fe	7.7	4.5	1.9	8.5		126
5b-1	Lachish	232	8th C	fe	6.6	4.6	1.6	8.4		126
5b-1	Igdyr	2	UR	fe	6.7	4.6	1.8		burial	126
5b-1	Nimrud	31	late 7th C	fe	7.3	4.6	1.6	9.5	destr.	127
5b-1	Lachish	245	8th C	fe	7.3	4.6	1.7	10.7		127
5b-1	Lachish	145	8th C	fe	8.7	4.6	1.4	10.8		127
5b-1	Hasanlu	21	8th C	fe	10.1	4.6	1.5		destr.	127
5b-1	Lachish	207	8th C	fe	6.1	4.7	1.3	5.3		127
5b-1	Lachish	331	8th C	fe	6.2	4.7	1.7	8.2		127
5b-1	Igdyr	3	UR	fe	6.5	4.7	1.7		burial	128
5b-1	Lachish	333	8th C	fe	6.5	4.7	1.9	9.5		128
5b-1	Nimrud	34	late 7th C	fe	6.8	4.7	1.4	8	destr.	128
5b-1	Nimrud	10	late 7th C	fe	7.2	4.7	1.9	12	destr.	128
5b-1	Lachish	199	8th C	fe	6.6	4.8	1.2	4.9		128
5b-1	Lachish	209	8th C	fe	6.7	4.8	1.5	8.3		129
5b-1	Lachish	253	8th C	fe	6.8	4.8	1.9	8.0		129
5b-1	Lachish	261	8th C	fe	7.7	4.8	1.6	12.7		129
5b-1	Nimrud	12	late 7th C	fe	7.8	4.8	1.4	6	destr.	129
5b-1	Lachish	279	8th C	fe	8.1	4.8	1.9	11.9		130
5b-1	Lachish	291	8th C	fe	8.5	4.8	1.6	7.8		130
5b-1	Lachish	250	8th C	fe	6.9	4.9	1.4	5.8		130
5b-1	Lachish	238	8th C	fe	6.9	4.9	1.6	7.4		130
5b-1	Lachish	97	8th C	fe	7.0	4.9	1.6	8.2		130
5b-1	Lachish	131	8th C	fe	7.1	4.9	1.6	5.6		131
5b-1	Nimrud	11	late 7th C	fe	7.2	4.9	1.6	10.5	destr.	131
5b-1	Lachish	217	8th C	fe	7.2	4.9	1.7	11.3		131
5b-1	Lachish	98	8th C	fe	7.2	4.9	1.9	7.0		131
5b-1	Lachish	102	8th C	fe	7.4	4.9	1.9	8.1		131
5b-1	Lachish	247	8th C	fe	7.5	4.9	1.8	7.2		132
5b-1	Lachish	260	8th C	fe	8.2	4.9	1.9	12.3		132
5b-1	Lachish	292	8th C	fe	8.4	4.9	1.4	9.5		132
5b-1	Lachish	259	8th C	fe	8.6	4.9	1.5	7.6		132
5b-1!	Uruk	4	NB	fe	8.6	4.9	2.0		burial	133
5b-1	Sialk	46	9th-7th C	bz	10.5	4.9	1.9		burial	133
5b-1	Ayanis	43	ca. 650-590	fe	6.3	5.0	2.0		destr.	133
5b-1	Lachish	204	8th C	fe	6.4	5.0	1.2	4.9		133
5b-1	Lachish	267	8th C	fe	6.5	5.0	1.6	10.2		133
5b-1	Lachish	251	8th C	fe	6.6	5.0	1.6	5.9		133
5b-1	Lachish	114	8th C	fe	7.0	5.0	1.7	9.0		134
5b-1	Lachish	226	8th C	fe	7.3	5.0	2.0	8.9		134

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5b-1	Lachish	184	8th C	fe	7.4	5.0	1.6	8.7		134
5b-1	Lachish	233	8th C	fe	7.5	5.0	1.7	8.1		134
5b-1	Ayanis	30	ca. 650-590	fe	7.5	5.0	1.8		destr.	134
5b-1	Hasanlu	26	8th C	fe	7.8	5.0	1.6		destr.	135
5b-1	Ayanis	46	ca. 650-590	fe	8.0	5.0	2.2		destr.	135
5b-1	Lachish	228	8th C	fe	8.4	5.0	1.9	9.0		135
5b-1	Ayanis	41	ca. 650-590	fe	8.5	5.0	1.5		destr.	135
5b-1	Ayanis	42	ca. 650-590	fe	8.5	5.0	2.0		destr.	136
5b-1	Lachish	288	8th C	fe	8.6	5.0	1.7	15.3		136
5b-1!	Uruk	6	NB	fe	9.8	5.0	1.9		burial	136
5b-1	Toprakkale	8	ca. 650-590	fe	10.0	5.0	1.8			136
5b-1	Lachish	311	8th C	fe	6.8	5.1	1.4	6.3		137
5b-1	Lachish	266	8th C	fe	6.9	5.1	1.8	9.5		137
5b-1	Lachish	231	8th C	fe	7.3	5.1	1.5	8.1		137
5b-1	Lachish	203	8th C	fe	7.4	5.1	1.2	4.5		137
5b-1	Lachish	252	8th C	fe	7.4	5.1	1.9	9.0		138
5b-1	Lachish	236	8th C	fe	7.8	5.1	1.6	6.0		138
5b-1	Lachish	123	8th C?	fe	7.8	5.1	2.0	10.6		138
5b-1	Nimrud	232	late 7th C	fe	7.9	5.1	2	16	destr.	138
5b-1	Lachish	183	8th C	fe	8.1	5.1	1.7	9.5		139
5b-1	Lachish	243	8th C	fe	8.8	5.1	1.8	7.6		139
5b-1	Lachish	205	8th C	fe	5.5	5.2	1.0	2.8		139
5b-1	Igdyr	1	UR	fe	6.5	5.2	1.5		burial	139
5b-1	Lachish	202	8th C	fe	6.8	5.2	1.1	3.6		139
5b-1	Lachish	200	8th C	fe	6.9	5.2	1.2	7.2		139
5b-1	Lachish	239	8th C	fe	6.9	5.2	1.8	8.0		140
5b-1	Nimrud	29	late 7th C	fe	7.0	5.2	1.4	10	destr.	140
5b-1	Lachish	248	8th C	fe	7.3	5.2	1.6	7.3		140
5b-1	Lachish	237	8th C	fe	7.4	5.2	1.9	11.7		140
5b-1	Lachish	227	8th C	fe	7.4	5.2	2.0	12.4		141
5b-1	Lachish	218	8th C	fe	7.5	5.2	1.9	11.9		141
5b-1	Lachish	359	7th C	fe	7.6	5.2	1.5	7.4		141
5b-1	Lachish	112	8th C	fe	7.9	5.2	1.5	9.7		141
5b-1	Lachish	229	8th C	fe	7.9	5.2	1.8	10.6		142
5b-1	Lachish	263	8th C	fe	8.5	5.2	1.8	10.0		142
5b-1	Igdyr	4	UR	fe	6.4	5.3	1.5		burial	142
5b-1	Lachish	134	8th-7th C?	fe	6.8	5.3	1.4	4.1		142
5b-1	Lachish	122	8th C	fe	7.2	5.3	1.7	10.5		142
5b-1	Lachish	211	8th C	fe	7.4	5.3	1.3	7.5		143
5b-1	Lachish	17	8th-7th C	fe	7.4	5.3	2.0	11.7	cache	143
5b-1	Lachish	88	9th C	fe	8.0	5.3	1.1	6.0		143
5b-1	Hasanlu	20	8th C	fe	8.0	5.3	1.9		destr.	143
5b-1	Lachish	225	8th C	fe	8.0	5.3	2.0	9.6		143
5b-1	Lachish	295	8th C	fe	8.1	5.3	1.7	7.6		144
5b-1	Lachish	278	8th C	fe	8.9	5.3	1.7	12.6		144
5b-1	Lachish	44	8th C	fe	9.4	5.3	1.5			144
5b-1	Lachish	38	7th C	fe	9.4	5.3	2.5	18.5	destr.	144
5b-1	Ayanis	50	ca. 650-590	fe	9.9	5.3	2.3		destr.	145
5b-1	Lachish	208	8th C	fe	6.9	5.4	1.3	7.0		145
5b-1	Lachish	39	7th C	fe	7.2	5.4	1.9		destr.	145
5b-1	Lachish	265	8th C	fe	7.4	5.4	1.8	9.8		145
5b-1	Lachish	187	8th C	fe	7.8	5.4	1.7	10.6		146
5b-1	Lachish	296	8th C	fe	7.9	5.4	2.3	15.1		146
5b-1	Lachish	258	8th C	fe	8.0	5.4	1.9	9.5		146
5b-1	Lachish	246	8th C	fe	8.2	5.4	1.9	8.3		146
5b-1	Igdyr	5	UR	fe	8.4	5.4	1.6		burial	146
5b-1	Lachish	289	8th C	fe	8.4	5.4	2.0	8.9		147

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5b-1	Lachish	242	8th C	fe	8.5	5.4	1.8	8.3		147
5b-1	Lachish	196	8th C	fe	7.4	5.5	1.6	9.1		147
5b-1	Lachish	214	8th C	fe	7.5	5.5	1.3	6.8		147
5b-1	Ayanis	48	ca. 650-590	fe	7.6	5.5	2.0		destr.	147
5b-1	Lachish	133	8th C	fe	7.7	5.5	1.5	7.4		148
5b-1	Ayanis	57	ca. 650-590	fe	7.8	5.5	2.0		destr.	148
5b-1	Ayanis	47	ca. 650-590	fe	8.0	5.5	2.0		destr.	148
5b-1	Ayanis	58	ca. 650-590	fe	8.2	5.5	2.0		destr.	148
5b-1	Tell Knedig	14	NA	fe	8.6	5.5	1.7			148
5b-1	Nimrud	4	late 7th C	fe	8.7	5.5	1.9	13	destr.	148
5b-1	Nimrud	251	late 7th C	fe	8.8	5.5	1.5	16	destr.	149
5b-1	Nimrud	14	late 7th C	fe	8.9	5.5	1.7	17	destr.	149
5b-1	Ayanis	31	ca. 650-590	fe	9.0	5.5	1.8		destr.	149
5b-1	Ayanis	26	ca. 650-590	fe	9.6	5.5	1.8		destr.	149
5b-1	Lachish	222	8th C	fe	7.3	5.6	1.7	7.2		149
5b-1	Lachish	220	8th C	fe	7.3	5.6	1.9	12.4		150
5b-1	Uruk	29	NB	fe	7.9	5.6	2.4			150
5b-1	Lachish	172	8th C	fe	8.0	5.6	1.2	6.1		150
5b-1	Ayanis	59	ca. 650-590	fe	8.5	5.6	2.0		destr.	150
5b-1	Lachish	361	8th C	fe	8.5	5.6	2.1	14.9		151
5b-1	Ayanis	27	ca. 650-590	fe	8.6	5.6	1.7		destr.	151
5b-1	Tell Knedig	4	NA	fe	9.5	5.6	1.3		burial	151
5b-1	Ayanis	56	ca. 650-590	fe	9.6	5.6	2.0		destr.	151
5b-1	Toprakkale	7	ca. 650-590	fe	10.8	5.6	1.4			151
5b-1	Lachish	213	8th C	fe	7.3	5.7	1.5	7.1		151
5b-1	Nimrud	235	late 7th C	fe	7.8	5.7	1,5	12	destr.	152
5b-1	Lachish	186	8th C	fe	8.0	5.7	1.7	7.6		152
5b-1	Lachish	99	8th C	fe	8.0	5.7	2.2	11.5		152
5b-1	Lachish	182	8th C	fe	8.2	5.7	1.7	9.7		152
5b-1	Lachish	148	8th C	fe	8.3	5.7	1.8	7.4		152
5b-1	Ayanis	61	ca. 650-590	fe	8.4	5.7	2.1		destr.	153
5b-1	Tell Knedig	8	NA	fe	9.4	5.7	1.6		burial	153
5b-1	Nippur	5	NB-Ach	fe	9.9	5.7	1.8		burial	153
5b-1	Ayanis	40	ca. 650-590	fe	10.0	5.7	1.8		destr.	153
5b-1	Lachish	294	8th C	fe	10.0	5.7	1.8	13.3		154
5b-1	Ayanis	55	ca. 650-590	fe	10.5	5.7	2.0		destr.	154
5b-1	Lachish	171	8th C	fe	7.2	5.8	1.2	7.7		154
5b-1	Nimrud	32	late 7th C	fe	7.4	5.8	1.5	8.5	destr.	154
5b-1	Lachish	90	9th C	fe	8.0	5.8	1.4	10.8		154
5b-1	Lachish	167	8th C	fe	8.0	5.8	1.5	9.8		154
5b-1	Lachish	154	8th C	fe	8.4	5.8	1.6	11.5		155
5b-1	Lachish	113	7th C?	fe	8.5	5.8	1.8	11.3		155
5b-1	Lachish	161	8th C	fe	8.6	5.8	1.4	7.5		155
5b-1	Ayanis	49	ca. 650-590	fe	9.4	5.8	2.2		destr.	155
5b-1	Lachish	168	8th C	fe	7.8	5.9	1.6	13.0		156
5b-1	Lachish	174	8th C	fe	8.3	5.9	1.2	6.5		156
5b-1	Lachish	155	8th C	fe	8.6	5.9	1.7	8.9		156
5b-1	Tell Knedig	6	NA	fe	9.1	5.9	1.4		burial	156
5b-1	Tell Knedig	5	NA	fe	9.7	5.9	1.7		burial	156
5b-1	Tell Knedig	2	NA	fe	7.5	6.0	1.9		burial	156
5b-1	Nimrud	3	late 7th C	fe	9.1	6.0	1.9	16	destr.	156
5b-1	Hasanlu	19	8th C	fe	9.4	6.0	1.9		destr.	157
5b-1	Ayanis	53	ca. 650-590	fe	10.1	6.0	2.0		destr.	157
5b-1	Ayanis	52	ca. 650-590	fe	10.7	6.0	1.9		destr.	157
5b-1	Ayanis	44	ca. 650-590	fe	10.8	6.0	2.0		destr.	157
5b-1	Lachish	108	8th C	fe	8.0	6.1	1.3	8.8		158
5b-1	Lachish	157	8th C	fe	8.3	6.1	1.3	6.0		158

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5b-1	Lachish	144	8th C	fe	8.5	6.1	1.7	10.6		158
5b-1	Lachish	185	8th C	fe	8.6	6.1	1.5	8.9		158
5b-1	Tell Knedig	1	NA	fe	7.2	6.2	1.6		burial	158
5b-1	Lachish	169	8th C	fe	7.5	6.2	1.4	6.7		158
5b-1	Lachish	158	8th C	fe	9.0	6.2	1.3	11.1		159
5b-1	Lachish	152	8th C	fe	9.6	6.2	1.7	11.1		159
5b-1	Toprakkale	11	ca. 650-590	fe	9.9	6.2	2.4			159
5b-1	Ayanis	54	ca. 650-590	fe	10.4	6.2	2.0		destr.	159
5b-1	Bastam	7	ca. 650	fe	10.6	6.2	2.0		destr.	159
5b-1	Tell Knedig	9	NA	fe	11.1	6.2	1.7		burial	160
5b-1	Ayanis	45	ca. 650-590	fe	12.2	6.2	2.1		destr.	160
5b-1	Lachish	170	8th C	fe	7.4	6.3	1.4	7.3		160
5b-1	Lachish	193	8th C	fe	8.1	6.3	1.5	11.4		160
5b-1	Lachish	89	9th C	fe	8.2	6.3	1.5	5.6		160
5b-1	Lachish	101	8th C	fe	9.1	6.3	1.7	14.0		161
5b-1	Tell Knedig	3	NA	fe	10.1	6.3	1.6		burial	161
5b-1	Ayanis	66	ca. 650-590	fe	10.9	6.3	2.3		destr.	161
5b-1	Lachish	224	8th C	fe	8.5	6.4	2.5	9.8		161
5b-1	Tell Knedig	7	NA	fe	9.3	6.4	1.9		burial	161
5b-1	Lachish	210	8th C	fe	7.0	6.5	1.3	10.2		161
5b-1	Lachish	221	8th C	fe	7.6	6.5	2.0	10.5		162
5b-1	Lachish	100	8th C	fe	7.7	6.5	1.6	11.0		162
5b-1	Lachish	192	8th C	fe	8.7	6.5	1.5	9.8		162
5b-1	Ayanis	51	ca. 650-590	fe	8.7	6.5	2.1		destr.	162
5b-1	Ayanis	60	ca. 650-590	fe	8.7	6.5	2.2		destr.	162
5b-1	Lachish	150	8th C	fe	8.8	6.5	1.3	8.9		163
5b-1	Ayanis	62	ca. 650-590	fe	9.0	6.5	2.5		destr.	163
5b-1	Lachish	153	8th C	fe	9.3	6.5	1.4	9.8		163
5b-1	Lachish	275	8th C	fe	9.9	6.5	2.2	12.5		163
5b-1	Ayanis	64	ca. 650-590	fe	13.8	6.5	2.0		destr.	164
5b-1	Lachish	95	8th C	fe	9.6	6.6	1.3	10.3		164
5b-1	Lachish	276	8th C	fe	10.3	6.6	1.7	16.3		164
5b-1	Ayanis	67	ca. 650-590	fe	9.8	6.7	2.4		destr.	165
5b-1	Nimrud	13	late 7th C	fe	10.7	6.7	2.3	24	destr.	165
5b-1	Lachish	156	8th C	fe	8.5	6.8	1.4	12.5		165
5b-1	Lachish	160	8th C	fe	8.8	6.8	1.2	9.5		165
5b-1	Ayanis	63	ca. 650-590	fe	12.0	6.8	2.2		destr.	166
5b-1	Lachish	293	8th C	fe	8.4	6.9	1.6	12.2		166
5b-1	Lachish	159	7th C	fe	9.0	6.9	1.4	6.9		166
5b-1	Lachish	354	8th C	fe	9.4	6.9	1.6	14.4		166
5b-1	Lachish	107	7th C?	fe	8.0	7.0	1.5	10.4		166
5b-1	Lachish	166	8th C	fe	8.2	7.0	1.6	9.1		167
5b-1	Lachish	146	8th C	fe	9.8	7.0	1.6	8.4		167
5b-1	Ayanis	65	ca. 650-590	fe	9.8	7.0	2.0		destr.	168
5b-1	Lachish	104	8th C	fe	9.5	7.1	1.5	8.1		168
5b-1	Lachish	68	9th C	fe	8.3	7.2	1.5	12.9		168
5b-1	Lachish	109	9th-8th C	fe	10.6	7.2	1.7	10.8		168
5b-1	Ayanis	29	ca. 650-590	fe	13.1	7.2	2.0		destr.	168
5b-1	Lachish	111	7th C?	fe	10.2	7.3	1.8	20.7		169
5b-1	Lachish	110	8th C	fe	9.8	7.4	1.7	17.3		169
5b-1	Lachish	201	8th C	fe	8.1	7.6	0.7	4.5		169
5b-1	Lachish	277	8th C	fe	10.0	7.6	1.3	12.7		170
5b-1	Lachish	163	8th C	fe	9.0	7.9	1.5	12.9		170
5b-1	Lachish	162	8th C	fe	9.4	7.9	1.6	16.6		170
5b-1	Lachish	143	7th C	fe	12.2	9.0	1.6	20.1		171
5b-1	Nimrud	26	late 7th C	fe	4.9	2.5*	1.4	4.5	destr.	171
5b-1	Nimrud	40	late 7th C	fe	5.2	2.9*	1.5	4.5	destr.	171

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5b-1	Nimrud	35	late 7th C	fe	5.4	2.9*	1.5	6.5	destr.	171
5b-1	Bastam	5	UR	fe	4.9	3.1*	1.4			171
5b-1	Nimrud	41	late 7th C	fe	5.7	3.1*	1.7	5	destr.	171
5b-1	Nimrud	27	late 7th C	fe	4.9	3.2*	1.4	3.5	destr.	171
5b-1	Bastam	1	UR	fe	8.3	3.2*	1.8			171
5b-1	Nimrud	38	late 7th C	fe	6.2	3.6*	1.6	6	destr.	172
5b-1	Nimrud	238	late 7th C	fe	7.5	3.7*	1.4	10.5	destr.	172
5b-1	Lachish	86	9th C	fe	5.0	3.8*	1.3	5.6		172
5b-1	Nimrud	30	late 7th C	fe	6.7	3.8*	1.8	13.5	destr.	172
5b-1	Lachish	91	8th C	fe	7.2	3.8*	1.7	4.6		172
5b-1	Hasanlu	23	8th C	fe	8.1	3.9*	1.4		destr.	172
5b-1	Bastam	13	UR	fe	8.0	4.2*	1.8			172
5b-1	Nimrud	33	late 7th C	fe	6.8	4.3*	1.7	8	destr.	173
5b-1	Uruk	7	NB	fe	7.8	4.3*	2.3		burial	173
5b-1	Lachish	106	8th C	fe	7.2	4.4*	1.2	5.6		173
5b-1	Lachish	327	8th C	fe	6.6	4.7*	1.7	5.9		173
5b-1	Lachish	219	8th C	fe	7.5	4.7*	1.8	10.9		173
5b-1	Lachish	94	8th C	fe	8.2	4.8*	1.7	7.4		174
5b-1	Nimrud	252	late 7th C	fe	7.6	4.9*	2	12	destr.	174
5b-1	Lachish	290	8th C	fe	8.5	5.0*	1.5	11.1		174
5b-1	Lachish	105	8th C	fe	8.0	5.6*	1.6	8.4		174
5b-1	Nimrud	236	late 7th C	fe	9.3	5.8*	1.6	19.5	destr.	174
5b-1!	Gerar	68	?	fe	7.7	6.0*	1.9			174
5b-1	Gerar	6	?	fe	11.7	6.6*	2.2			175
5b-1	Lachish	66	9th C	fe	10.3	7.2*	1.5	15.2		175
5b-1	Nineveh	22	612	fe	7.0		0.8		destr.	
5b-1?	Nimrud	28	late 7th C	fe	4.1	2.0	1.2	2.5	destr.	175
5b-1?	Nimrud	20	late 7th C	fe	4.9	3.4	1.4	3.5	destr.	175
5b-1?	Ayanis	16	ca. 650-590	fe	4.7	3.5	1.2		destr.	175
5b-1?	Nimrud	22	late 7th C	fe	4.8	3.5	1.4	4	destr.	176
5b-1?	Nimrud	23	late 7th C	fe	5.4	3.7	1.6	5	destr.	176
5b-1?	Nimrud	19	late 7th C	fe	5.0	3.9	1.5	4.5	destr.	176
5b-1?	Nimrud	239	late 7th C	fe	6.1	3.9	1.3	7	destr.	176
5b-1?	Uruk	8	NB	fe	6.9	4.3	1.8		burial	176
5b-1?	Lachish	249	8th C	fe	8.1	4.4	1.9	12.3		177
5b-1?	Lachish	96	8th C	fe	5.9	4.5	1.7	5.6		177
5b-1?	Uruk	10	NB	fe	6.1	4.5	1.9		burial	177
5b-1?	Fakhariya	10	NA	bz	6.8	4.5	1.6		burial	177
5b-1?	Lachish	164	8th C	fe	7.7	5.0	1.4	7.6		178
5b-1?	Nimrud	6	late 7th C	fe	7.6	5.1	1.9	12.5	destr.	178
5b-1?	Lachish	21	8th C?	fe	6.6	5.2	1.5		cache	178
5b-1?	Lachish	364	8th C	fe	6.8	5.2	1.8	9.2	cache	178
5b-1?	Lachish	223	8th C	fe	10.2	5.2	2.2	11.5		178
5b-1?	Nimrud	16	late 7th C	fe	9.2	5.3	1.8	18	destr.	178
5b-1?	Carchemish	34	late 7th C	fe	7.1	5.8	2.2		destr.	178
5b-1?	Uruk	9	NB	fe	7.3	6.2	2.0		burial	179
5b-1?	Lachish	215	8th C	fe	7.4	6.3	1.5	7.2		179
5b-1?	Lachish	92	8th C	fe	7.7	6.3	1.5	7.5		179
5b-1?	Lachish	165	8th C	fe	7.9	6.8	1.4	7.5		179
5b-1?	Carchemish	32	late 7th C	fe	8.1	7.1	2.6		destr.	179
5b-1?	Lachish	67	9th C	fe	8.4	7.3	1.9	11.6		180
5b-1?	Nimrud	15	late 7th C	fe	8.9	7.9	1.6	13	destr.	180
5b-1?	Nush-i Jan	4	700-500	fe	3.0	1.8*	1.3			180
5b-2	Lachish	151	8th C	fe	8.8	6.0	1.5	9.0		180
5b-4?	Nush-i Jan	2	700-500	fe	3.2	1.5*	1.1			181
5b-5	Hasanlu	41	8th C	fe	6.9	4.1	1.8		destr.	181
5b-5	Fakhariya	12	NA	bz	7.5	4.1	1.7		burial	181

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5b-5	Hasanlu	43	8th C	fe	9.4	4.2	2.0		destr.	181
5b-5?	Ayanis	70	ca. 650-590	fe	8.7	4.4	2.2		destr.	181
5b-6	Hasanlu	46	8th C	fe	5.0	3.8	1.9		destr.	181
5b-6	Hasanlu	44	8th C	fe	8.7	3.8	1.9		destr.	181
5b-6?	Hasanlu	45	8th C	fe	5.8	3.8	2.1		destr.	181
5b-10?	Ayanis	28	ca. 650-590	fe	10.0	4.5	1.9		destr.	182
5b-14	Ayanis	69	ca. 650-590	fe	16.2	7.8	2.0		destr.	182
5b-19	Hasanlu	14	8th C	fe	6.3	4.8	1.4		destr.	182
5b-21!	Gerar	75	?	fe	8.3	5.1	1.4			182
5b-37	Tell Knedig	10	NA	fe	7.8	5.4	2.3		burial	183
5b-37	Tell Knedig	12	NA	fe	8.4	5.6	2.3		burial	183
5b-37	Tell Knedig	11	NA	fe	8.7	6.3	2.3		burial	183
5b-37?	Carchemish	28	late 7th C	fe	5.6	3.8	1.5	6.0	destr.	183
5c-1	Ayanis	33	ca. 650-590	fe	7.0	3.8	1.8		destr.	184
5c-1	Ayanis	32	ca. 650-590	fe	7.5	3.8	1.8		destr.	184
5c-1	Ayanis	25	ca. 650-590	fe	9.2	5.3	1.9		destr.	184
5c-1	Ayanis	24	ca. 650-590	fe	8.6	5.4	1.7		destr.	184
5c-1	Ayanis	39	ca. 650-590	fe	9.6	5.5	1.6		destr.	184
5d-14	Ayanis	90	ca. 650-590	bz	15.2	8.6	1.8		destr.	185
5e-1	Hasanlu	18	8th C	fe	11.1	6.5	1.7		destr.	185
5e-20	Assur	59	?	bz	3.8	2.5	1.2			186
5e-20	Assur	60	?	bz	4.1	2.5	1.7			186
5e-20	Carchemish	26	late 7th C	fe	5.3	2.8	1.1	5.0	destr.	186
5e-20	Carchemish	25	late 7th C	fe	6.0	3.2	1.1	7.5	destr.	186
5e-57	Toprakkale	17	ca. 650-590	fe	5.8	2.3	1.4			186
5f-1	Toprakkale	12	ca. 650-590	fe	5.5	3.5	1.1			187
5f-1	Hasanlu	13	8th C	fe	4.7	4.2	1.1		destr.	187
5f-1!	Toprakkale	14	ca. 650-590	fe	7.3	4.4	1.4			187
5f-1	Marlik	37	1450-850	bz	7.8	5.5	1.8		burial	187
5f-1	Bastam	11	UR	fe	8.8	5.5	1.5			187
5f-1	Marlik	33	1450-850	bz	9.0	6.2	2.5		burial	187
5f-1	Marlik	35	1450-850	bz	8.9	6.8	1.8		burial	188
5f-1	Carchemish	39	late 7th-early 6th C	bz	?	?	?		destr.	188
5f-1?	Sialk	38	9th-7th C	bz	9.1	6.0	1.9		burial	188
5f-5	Marlik	29	1450-950	bz	7.5	3.9	1.8		burial	188
5g-1	Toprakkale	10	ca. 650-590	fe	6.5	3.0	1.2			189
5g-1	Lachish	70	8th C	fe	6.9	5.0	1.9	6.7		189
5g-1	Toprakkale	5	ca. 650-590	fe	10.1	5.1	1.6			189
5g-1	Toprakkale	6	ca. 650-590	fe	8.7	6.4	1.9			189
5g-1	Marlik	22	1550-750	bz	10.6	6.5	1.6		burial	189
5g-1?	Lachish	71	8th C	fe	6.9	5.3	1.8	6.7		189
5g-4	Marlik	16	1450-950	bz	7.1	2.6	1.7		burial	190
5g-4	Marlik	15	1450-950	bz	7.3	2.7	1.8		burial	190
5g-4	Marlik	14	1450-950	bz	6.6	2.9	1.8		burial	190
5g-4	Marlik	21	1450-1050	bz	10.2	6.0	1.8		burial	190
5g-4	Marlik	24	1550-750	bz	16.8	9.8	3.0		burial	191
5g-5	Karchaghbyur	4	8th-7th C	bz	7.6	3.5	2.0		burial	191
5p-1	Gerar	65	?	fe	5.0	4.0	1.4			192
5p-1	Marlik	38	1450-850	bz	6.9	4.3	2.1		burial	192
5p-1	Gerar	51	?	fe	5.8	4.4	1.6			192
5p-1	Sialk	78	9th-7th C	??	6.1	4.4	2.8		burial	192
5p-1	Gerar	2	?	bz	8.5	4.6	1.3			192
5p-1!	Hasanlu	55	8th C	bz	8.1	4.7	1.7		destr.	192
5p-1	Gerar	4	?	bz	7.3	4.9	1.3			192
5p-1!	Marlik	36	1450-850	bz	9.3	5.9	2.1		burial	193
5p-1	Sialk	45	9th-7th C	bz	10.5	7.3	2.6		burial	193

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5p-1	Marlik	34	1450-850	bz	12.0	7.4	2.7		burial	193
5p-1	Sialk	75	9th-7th C	??	11.1	7.6	1.4		burial	194
5p-1	Sialk	50	9th-7th C	bz	12.4	8.2	2.9		burial	194
5p-1	Sialk	9	9th-7th C	fe	19.7	11.8	3.3		burial	194
5p-1	Carchemish	38	late 7th-early 6th C	bz	?	?	?		destr.	195
5p-1	Uruk	25	NB?	bz	4.4	2.9*	1.8			195
5p-1	Nippur	2	NA	fe	6.0	3.8*	1.6		burial	195
5p-1?	Carchemish	24	late 7th C	fe	3.1	2.2	1.3	2.0	destr.	195
5p-1?	Gerar	72	?	fe	7.1	7.1*	2.2			195
5p-1?	Gerar	77	?	fe	8.5	8.5*	2.2			195
5p-2	Marlik	39	1450-850	bz	3.3	2.8	1.5		burial	196
5p-2	Uruk	22	NB?	bz	7.7	6.5	1.8			196
5p-2	Fakhariya	14	Iron Age	bz	8.9	7.2	1.8			196
5p-4	Karchaghbyur	2	8th-7th C	bz	7.6	3.2	1.6		burial	197
5p-4	Gerar	66	?	fe	6.0	5.4	1.7			197
5p-4	Gerar	76	?	fe	6.9	6.1	1.5			197
5p-5	Karchaghbyur	8	8th-7th C	bz	6.3	4.4	1.9		burial	197
5p-5	Marlik	28	1450-950	bz	7.9	5.5	2.1		burial	197
5p-5	Hasanlu	54	8th C	bz	10.1	6.7	2.8		destr.	198
5p-5	Carchemish	42	late 7th-early 6th C	fe	?	?	?		destr.	198
5p-5	Carchemish	43	late 7th-early 6th C	fe	?	?	?		destr.	198
5p-7	Karchaghbyur	5	8th-7th C	bz	8.3	5.6	3.0		burial	198
5p-7	Marlik	5	1550-950	bz	8.0	7.2	4.4		burial	198
5p-8	Karchaghbyur	1	8th-7th C	bz	6.4	2.9	2.3*		burial	199
5p-8	Karchaghbyur	7	8th-7th C	bz	5.5	4.3	3.0		burial	199
5p-8	Marlik	7	1550-950	bz	8.9	5.5	3.7		burial	199
5p-8	Marlik	6	1550-950	bz	7.1	6.0	2.9*		burial	199
5p-8	Karchaghbyur	6	8th-7th C	bz	6.8	3.0*	2.3*		burial	199
5p-19?	Sialk	17	9th-7th C	bz	11.4	7.8	2.7		burial	200
5p-19?	Sialk	20	9th-7th C	bz	11.9	8.9	2.6		burial	200
5p-20	Nush-i Jan	8	700-500	bz	3.1	2.7	1.5			200
5p-20	Sialk	41	9th-7th C	bz?	13.3	8.0	2.8		burial	201
5p-20?	Sialk	33	9th-7th C	?	7.4	5.8	1.9		burial	201
5p-20?	Sialk	32	9th-7th C	?	7.8	6.0	1.9		burial	201
5p-20?	Sialk	19	9th-7th C	bz	9.7	7.3	2.5		burial	201
5p-20?	Sialk	21	9th-7th C	bz	11.9	8.6	2.8		burial	202
5p-20?	Sialk	49	9th-7th C	bz	17.5	12.7	3.9		burial	202
5p-22	Sialk	43	9th-7th C	??	9.9	6.4	2.8		burial	203
5p-23	Sialk	42	9th-7th C	??	10.2	7.0	3.1		burial	203
5p-39	Carchemish	37	late 7th C	fe	11.5	9.3	2.2		destr.	203
5p-39	Carchemish	41	late 7th-early 6th C	fe	?	?	?		destr.	203
5p-41	Carchemish	35	late 7th C	fe	9.3	7.7	1.9		destr.	204
5p-41	Carchemish	31	late 7th C	fe	9.9	8.4	2.0		destr.	204
5q-1	Hasanlu	34	8th C	fe	3.8	2.7	1.3		destr.	204
5q-1	Carchemish	21	late 7th C	fe	5.6	3.0	1.5	6.0	destr.	204
5q-1	Carchemish	29	late 7th C	fe	5.6	3.7	1.4	6.0	destr.	204
5q-1	Hasanlu	22	8th C	fe	7.6	4.0	1.6		destr.	205
5q-1	Lachish	119	7th C	fe	6.5	4.4	1.9	10.6		205
5q-1	Lachish	365	8th C	fe	7.4	4.4	1.7	12.1		205
5q-1	Lachish	120	9th-8th C	fe	6.2	4.7	1.5	8.3		205
5q-1	Nimrud	233	late 7th C	fe	8.6	5.9	1.6	15.0	destr.	206
5q-1	Nimrud	234	late 7th C	fe	8.7	5.9	1.0	10.0	destr.	206
5q-1	Lachish	149	8th C	fe	9.5	5.9	1.6	9.8		206
5q-1	Lachish	81	9th C	cu	8.5	6.1	1.7	14.4		206
5q-1!	Gerar	67	?	fe	6.4	6.2	2.0			206
5q-1	Carchemish	33	late 7th C	fe	9.5	7.3	2.7		destr.	206

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
5q-1	Lachish	25	8th-7th C	fe	5.7	3.0*	1.6			207
5q-1	Lachish	117	8th C	fe	7.7	4.4*	2.3	16.7		207
5q-1	Lachish	118	8th C	fe	7.3	4.7*	1.9	8.4		207
5q-2!	Uruk	14	NB or Ach	bz	4.3	2.9	1.3			207
5q-3	Assur	3	NA	bz	4.4	2.1	1.3		burial	207
5q-4	Marlik	12	1450-950	bz	7.2	3.4	1.7		burial	208
5q-4	Marlik	11	1550-1050	bz	8.1	3.6	2.5		burial	208
5q-4	Hasanlu	63	8th C	bz	6.8	3.8	2.0		destr.	208
5q-4	Marlik	10	1550-1050	bz	7.6	4.1	1.7		burial	208
5q-4	Marlik	23	1550-750	bz	10.7	6.8	1.5		burial	208
5q-5	Marlik	9	1550-1050	bz	7.1	3.0	1.5		burial	209
5q-5	Hasanlu	65	8th C	bz	6.8	3.5	2.0		destr.	209
5q-5	Sultantepe	1	late NA?	bz	8.2	4.2	2.1		destr.	209
5q-5	Hasanlu	61	8th C	bz	5.1	4.7	2.0		destr.	209
5q-5	Marlik	19	1450-1050	bz	9.5	4.8	1.5		burial	209
5q-5!	Hasanlu	60	8th C	bz	8.3	5.1	2.2		destr.	209
5q-5	Marlik	17	1450-1050	bz	9.6	5.1	1.3		burial	210
5q-5	Marlik	20	1450-1050	bz	10.3	5.1	1.5		burial	210
5q-5	Marlik	31	1450-950	bz	9.2	7.1	2.1*		burial	210
5q-5	Marlik	18	1450-1050	bz	18.2	10.9	3.1		burial	210
5q-6	Marlik	41	1350-950	bz	7.1	4.1	1.7		burial	211
5q-8	Hasanlu	59	8th C	bz	7.7	5.2	2.2		destr.	211
5q-22	Assur	55	?	bz	5.2	2.2	1.9			211
5q-22	Assur	54	?	bz	4.4	3.4	1.9			211
5q-22	Assur	57	?	bz	8.6	3.5	1.7			211
5q-22	Marlik	13	1450-950	bz	8.5	3.8	2.1		burial	211
5r-1	Carchemish	20	late 7th C	fe	9.6	5.1	2.0	15.0	destr.	212
5r-1	Sialk	76	9th-7th C	??	13.5	7.4	2.1		burial	212
5r-4	Assur	56	?	bz	4.8	3.6	1.7			212
5r-4	Sialk	77	9th-7th C	??	9.9	4.5	2.8		burial	212
5r-5	Hasanlu	62	8th C	bz	4.3	3.8	1.9		destr.	212
5r-20	Sialk	71	9th-7th C	??	5.1	1.6	1.2		burial	212
5u-1	Sialk	58	9th-7th C	??	9.5	7.0	1.5		burial	213
5u-1	Sialk	59	9th-7th C	??	9.5	7.2	1.0		burial	213
5u-1?	Hasanlu	58	8th C	bz	7.6	4.0	1.8		destr.	213
5u-21!	Sialk	72	9th-7th C	??	4.5	1.8	1.7		burial	213
5u-21	Sialk	69	9th-7th C	??	9.0	5.2	1.6		burial	213
5u-21	Sialk	70	9th-7th C	??	8.5	5.6	2.3		burial	213
5u-22	Marlik	30	1450-950	bz	9.9	7.0	3.0		burial	214
5u-28	Fakhariya	7	NA	bz	9.6	5.6	1.6		burial	214
5v-1	Assur	2	NA	bz	7.2	5.2	1.6		burial	214
5v-1!	Hasanlu	56	8th C	bz	6.1	2.7*	1.6		destr.	214
5v-28!	Fakhariya	11	NA	bz	6.5	3.5	1.5		burial	215
5v-28	Fakhariya	8	NA	bz	9.1	5.4	1.6		burial	215
5v-28	Fakhariya	6	NA	bz	9.8	5.4	1.8		burial	215
5v-28	Fakhariya	9	NA	bz	8.9	5.5	1.8		burial	215
5y-3	Bastam	21	UR	fe	9.8	4.2	1.7			216
5y-22	Assur	58	?	fe	5.7	2.3	1.4			216
5z-14	Ayanis	88	ca. 650-590	bz	9.0	8.0	2.0		destr.	217
5z-14	Ayanis	89	ca. 650-590	bz	11.5	8.7	1.9		destr.	217
5z-14	Nimrud	250	NA	fe	6.2	5.4*	1.8	13.0	cache	217
6	Nippur	4	NB-Ach	bz	4.0	1.9	0.9			218
7d	Hasanlu	47	8th C	fe	8.5	6.8	1.6		destr.	218
7d	Marlik	3	?	bz	15.0	9.1	2.2		burial	218
8	Marlik	1	?	bz	19.3	4.3	1.4		burial	219
8	Marlik	2	?	bz	18.0	5.1	1.6*		burial	219

Type	Site	No.	Date	Mat	Ln.	Bld.	Wd.	Wgt.	Context	Plate
9	Hasanlu	84	8th C	os	3.5	1.7	0.9		destr.	220
9	Hasanlu	72	8th C	os	4.6	2.6	1.5		destr.	220
9	Hasanlu	83	8th C	os	4.8	2.9	0.8		destr.	220
9	Hasanlu	73	8th C	os	4.8	3.0	1.5		destr.	220
9	Hasanlu	81	8th C	os	4.5	3.2	1.0		destr.	220
9	Lachish	84	8th C	os	3.6	3.3	1.3	1.0		220
9	Hasanlu	76	8th C	os	6.0	3.4	1.3		destr.	220
9	Lachish	12	8th C	os	4.6	3.5	0.8			220
9	Lachish	83	8th C	os	4.4	3.8	1.7	2.0		220
9	Hasanlu	74	8th C	os	4.0	4.0	1.4		destr.	221
9	Hasanlu	75	8th C	os	4.1	4.1	1.5		destr.	221
9	Lachish	82	8th C	os	6.2	4.1	0.8	2.2		221
9	Lachish	85	8th C	os	4.4	4.4	1.6	1.8		221
9	Hasanlu	79	8th C	os	4.8	4.4	0.8		destr.	221
9	Hasanlu	69	8th C	os	6.3	5.1	1.7		destr.	222
9	Hasanlu	71	8th C	os	6.6	5.1	1.7		destr.	222
9	Lachish	10	8th C	os	6.4	5.2	1.1			222
9	Hasanlu	70	8th C	os	7.9	5.2	1.7		destr.	222
9	Hasanlu	78	8th C	os	6.0	5.8	0.6		destr.	222
9	Hasanlu	77	8th C	os	7.2	7.2	0.9		destr.	222
9	Karchaghbyur	3	8th-7th C	os	10.1	7.8	1.8		burial	222
9	Marlik	45	?	os	6.8	?	2.2		burial	223
9	Marlik	42	?	os	7.4	?	1.8		burial	223
9	Marlik	46	?	os	7.5	?	2.0		burial	223
9	Marlik	44	?	os	10.0	10.0?	1.9		burial	223
9	Hasanlu	82	8th C	os	3.0	2.0*	0.7		destr.	223
9	Hasanlu	80	8th C	os	3.9	2.0*	0.6		destr.	223
9	Lachish	11	8th C	os	7.0	5.5?	0.8			223
9	Marlik	47	?	os	5.8	5.8?	1.6		burial	223
9	Marlik	48	?	os	8.3	8.3?	1.8		burial	223
9	Marlik	43	?	os	9.6	9.6?	1.9		burial	223

Appendix C: Arrowhead Sources

Note that individual artifacts are not always given specific find numbers in their publications, and therefore other ways to identify then precisely must be employed. When multiple items are depicted in a figure without individual numbers, I use the number, I have given them each a letter, starting with "a" for the example in the upper left and then proceeded in horizontal rows from left to right. Thus Carchemish 43 is the rightmost of 6 unnumbered projectile points in Woolley 1921, p. 81, fig. 20, and is therefore cited as fig. 20:f.

Site	No.	Type	Item No.	Source
Assur	1	3a-2	11907b	Haller 1954, p. 26
Assur	2	5v-1	14289e	Haller 1954, p. 28
Assur	3	5q-3	14025	Haller 1954, p. 23
Assur	4	1c-1	14289f	Haller 1954, p. 28
Assur	5	3a-2	8736	Vorderasiatisches Museum Berlin
Assur	6	3a-2	8582	Vorderasiatisches Museum Berlin
Assur	7	3a-2?	7526	Vorderasiatisches Museum Berlin
Assur	8	3a-2	9099	Vorderasiatisches Museum Berlin
Assur	9	2-2	9066	Vorderasiatisches Museum Berlin
Assur	10	3a-2	8472a	Vorderasiatisches Museum Berlin
Assur	11	2-2	8472b	Vorderasiatisches Museum Berlin
Assur	12	3a-2	19362a	Vorderasiatisches Museum Berlin
Assur	13	3a-2	19362b	Vorderasiatisches Museum Berlin
Assur	14	3a-2	19362c	Vorderasiatisches Museum Berlin
Assur	15	3a-2	19362d	Vorderasiatisches Museum Berlin
Assur	16	3a-2	19352a	Vorderasiatisches Museum Berlin
Assur	17	3a-2	19352b	Vorderasiatisches Museum Berlin
Assur	18	3a-2	19352c	Vorderasiatisches Museum Berlin
Assur	19	3a-2	19323b	Vorderasiatisches Museum Berlin
Assur	20	3a-2	19323a	Vorderasiatisches Museum Berlin
Assur	21	3a-3	19324a	Vorderasiatisches Museum Berlin
Assur	22	3a-3	19324b	Vorderasiatisches Museum Berlin
Assur	23	3a-3	19324b	Vorderasiatisches Museum Berlin
Assur	24	3a-3	19353	Vorderasiatisches Museum Berlin
Assur	25	3a-2	19336	Vorderasiatisches Museum Berlin
Assur	26	3c-2	19323c	Vorderasiatisches Museum Berlin
Assur	27	3a-3	10086	Vorderasiatisches Museum Berlin
Assur	28	3a-3	11097b	Vorderasiatisches Museum Berlin
Assur	29	2-3	11558	Vorderasiatisches Museum Berlin
Assur	30	2-3	11631	Vorderasiatisches Museum Berlin
Assur	31	3a-3	14917	Vorderasiatisches Museum Berlin
Assur	32	3a-3	14927a	Vorderasiatisches Museum Berlin
Assur	33	3a-1	15528	Vorderasiatisches Museum Berlin
Assur	34	3a-2	16671	Vorderasiatisches Museum Berlin
Assur	35	3a-2	18202	Vorderasiatisches Museum Berlin
Assur	36	3a-2	18326	Vorderasiatisches Museum Berlin
Assur	37	3a-2	18363	Vorderasiatisches Museum Berlin
Assur	38	2-2	18180	Vorderasiatisches Museum Berlin
Assur	39	3a-2	18360	Vorderasiatisches Museum Berlin
Assur	40	3a-3!	18363	Vorderasiatisches Museum Berlin

Site	No.	Type	Item No.	Source
Assur	41	3a-8	5915	Vorderasiatisches Museum Berlin
Assur	42	3a-1	6101	Vorderasiatisches Museum Berlin
Assur	43	3a-1?	5833a	Vorderasiatisches Museum Berlin
Assur	44	3a-14?	6057	Vorderasiatisches Museum Berlin
Assur	45	3a-2	19368a	Vorderasiatisches Museum Berlin
Assur	46	3a-2	19368b	Vorderasiatisches Museum Berlin
Assur	47	2-3	13318	Vorderasiatisches Museum Berlin
Assur	48	3a-7	21110	Vorderasiatisches Museum Berlin
Assur	49	3a-3	1372	Vorderasiatisches Museum Berlin
Assur	50	1c-1	8264	Vorderasiatisches Museum Berlin
Assur	51	1c-1	8190	Vorderasiatisches Museum Berlin
Assur	52	3a-3	11246	Vorderasiatisches Museum Berlin
Assur	53	3a-11	11319	Vorderasiatisches Museum Berlin
Assur	54	5q-22	10177	Vorderasiatisches Museum Berlin
Assur	55	5q-22	12584	Vorderasiatisches Museum Berlin
Assur	56	5r-4	16642	Vorderasiatisches Museum Berlin
Assur	57	5q-22	13258	Vorderasiatisches Museum Berlin
Assur	58	5y-22	10096	Vorderasiatisches Museum Berlin
Assur	59	5e-20	20676	Vorderasiatisches Museum Berlin
Assur	60	5e-20	12678	Vorderasiatisches Museum Berlin
Ayanis	1	1c-2	1	Derın & Muscarella 2001, fig. 2
Ayanis	2	1a-1	2	Derın & Muscarella 2001, fig. 2
Ayanis	3	1a-2	3	Derın & Muscarella 2001, fig. 2
Ayanis	4	1a-1	4	Derın & Muscarella 2001, fig. 2
Ayanis	5	5a-1	5	Derın & Muscarella 2001, fig. 2
Ayanis	6	5a-1	6	Derın & Muscarella 2001, fig. 2
Ayanis	7	5a-1	7	Derın & Muscarella 2001, fig. 2
Ayanis	8	5a-1	8	Derın & Muscarella 2001, fig. 2
Ayanis	9	5a-1	9	Derın & Muscarella 2001, fig. 2
Ayanis	10	5a-1	10	Derın & Muscarella 2001, fig. 2
Ayanis	11	5a-4	11	Derın & Muscarella 2001, fig. 2
Ayanis	12	5a-1	12	Derın & Muscarella 2001, fig. 2
Ayanis	13	5a-1	13	Derın & Muscarella 2001, fig. 2
Ayanis	14	5a-1	14	Derın & Muscarella 2001, fig. 2
Ayanis	15	5a-1	15	Derın & Muscarella 2001, fig. 2
Ayanis	16	5b-1?	16	Derın & Muscarella 2001, fig. 2
Ayanis	17	5a-1	17	Derın & Muscarella 2001, fig. 2
Ayanis	18	5a-1	18	Derın & Muscarella 2001, fig. 2
Ayanis	19	5a-1	19	Derın & Muscarella 2001, fig. 2
Ayanis	20	5a-1	20	Derın & Muscarella 2001, fig. 2
Ayanis	21	5a-1	21	Derın & Muscarella 2001, fig. 2
Ayanis	22	5a-1	22	Derın & Muscarella 2001, fig. 2
Ayanis	23	5a-1	23	Derın & Muscarella 2001, fig. 2
Ayanis	24	5c-1	24	Derın & Muscarella 2001, fig. 3
Ayanis	25	5c-1	25	Derın & Muscarella 2001, fig. 3
Ayanis	26	5b-1	26	Derın & Muscarella 2001, fig. 3
Ayanis	27	5b-1	27	Derın & Muscarella 2001, fig. 3
Ayanis	28	5b-10?	28	Derın & Muscarella 2001, fig. 3
Ayanis	29	5b-1	29	Derın & Muscarella 2001, fig. 3
Ayanis	30	5b-1	30	Derın & Muscarella 2001, fig. 3
Ayanis	31	5b-1	31	Derın & Muscarella 2001, fig. 3
Ayanis	32	5c-1	32	Derın & Muscarella 2001, fig. 3
Ayanis	33	5c-1	33	Derın & Muscarella 2001, fig. 3

Site	No.	Type	Item No.	Source
Ayanis	34	5a-1	34	Derın & Muscarella 2001, fig. 3
Ayanis	35	5a-1	35	Derın & Muscarella 2001, fig. 3
Ayanis	36	5a-1	36	Derın & Muscarella 2001, fig. 3
Ayanis	37	5a-1	37	Derın & Muscarella 2001, fig. 3
Ayanis	38	5a-1	38	Derın & Muscarella 2001, fig. 3
Ayanis	39	5c-1	39	Derın & Muscarella 2001, fig. 3
Ayanis	40	5b-1	40	Derın & Muscarella 2001, fig. 4
Ayanis	41	5b-1	41	Derın & Muscarella 2001, fig. 4
Ayanis	42	5b-1	42	Derın & Muscarella 2001, fig. 4
Ayanis	43	5b-1	43	Derın & Muscarella 2001, fig. 4
Ayanis	44	5b-1	44	Derın & Muscarella 2001, fig. 4
Ayanis	45	5b-1	45	Derın & Muscarella 2001, fig. 4
Ayanis	46	5b-1	46	Derın & Muscarella 2001, fig. 4
Ayanis	47	5b-1	47	Derın & Muscarella 2001, fig. 4
Ayanis	48	5b-1	48	Derın & Muscarella 2001, fig. 4
Ayanis	49	5b-1	49	Derın & Muscarella 2001, fig. 4
Ayanis	50	5b-1	50	Derın & Muscarella 2001, fig. 4
Ayanis	51	5b-1	51	Derın & Muscarella 2001, fig. 4
Ayanis	52	5b-1	52	Derın & Muscarella 2001, fig. 4
Ayanis	53	5b-1	53	Derın & Muscarella 2001, fig. 4
Ayanis	54	5b-1	54	Derın & Muscarella 2001, fig. 4
Ayanis	55	5b-1	55	Derın & Muscarella 2001, fig. 4
Ayanis	56	5b-1	56	Derın & Muscarella 2001, fig. 4
Ayanis	57	5b-1	57	Derın & Muscarella 2001, fig. 5
Ayanis	58	5b-1	58	Derın & Muscarella 2001, fig. 5
Ayanis	59	5b-1	59	Derın & Muscarella 2001, fig. 5
Ayanis	60	5b-1	60	Derın & Muscarella 2001, fig. 5
Ayanis	61	5b-1	61	Derın & Muscarella 2001, fig. 5
Ayanis	62	5b-1	62	Derın & Muscarella 2001, fig. 5
Ayanis	63	5b-1	63	Derın & Muscarella 2001, fig. 5
Ayanis	64	5b-1	64	Derın & Muscarella 2001, fig. 5
Ayanis	65	5b-1	65	Derın & Muscarella 2001, fig. 5
Ayanis	66	5b-1	66	Derın & Muscarella 2001, fig. 5
Ayanis	67	5b-1	67	Derın & Muscarella 2001, fig. 5
Ayanis	68	5b-1!	68	Derın & Muscarella 2001, fig. 5
Ayanis	69	5b-14	69	Derın & Muscarella 2001, fig. 5
Ayanis	70	5b-5?	70	Derın & Muscarella 2001, fig. 5
Ayanis	71	2-3	71	Derın & Muscarella 2001, fig. 6
Ayanis	72	2-3	72	Derın & Muscarella 2001, fig. 6
Ayanis	73	2-6	73	Derın & Muscarella 2001, fig. 6
Ayanis	74	2-3	74	Derın & Muscarella 2001, fig. 6
Ayanis	75	2-3	75	Derın & Muscarella 2001, fig. 6
Ayanis	76	2-3	76	Derın & Muscarella 2001, fig. 6
Ayanis	77	2-3	77	Derın & Muscarella 2001, fig. 6
Ayanis	78	2-3	78	Derın & Muscarella 2001, fig. 6
Ayanis	79	2-3	79	Derın & Muscarella 2001, fig. 6
Ayanis	80	2-3	80	Derın & Muscarella 2001, fig. 6
Ayanis	81	2-3	81	Derın & Muscarella 2001, fig. 6
Ayanis	82	2-3	82	Derın & Muscarella 2001, fig. 6
Ayanis	83	2-3	83	Derın & Muscarella 2001, fig. 6
Ayanis	84	2-3	84	Derın & Muscarella 2001, fig. 6
Ayanis	85	2-3	85	Derın & Muscarella 2001, fig. 6
Ayanis	86	2-3	86	Derın & Muscarella 2001, fig. 6

Site	No.	Type	Item No.	Source
Ayanis	87	2-3	87	Derın & Muscarella 2001, fig. 6
Ayanis	88	5z-14	88	Derın & Muscarella 2001, fig. 6
Ayanis	89	5z-14	89	Derın & Muscarella 2001, fig. 6
Ayanis	90	5d-14	90	Derın & Muscarella 2001, fig. 6
Ayanis	91	2-1	91	Derın & Muscarella 2001, fig. 7
Ayanis	92	2-1	92	Derın & Muscarella 2001, fig. 7
Ayanis	93	2-1	93	Derın & Muscarella 2001, fig. 7
Ayanis	94	2-1	94	Derın & Muscarella 2001, fig. 7
Ayanis	95	2-1	95	Derın & Muscarella 2001, fig. 7
Ayanis	96	2-1	96	Derın & Muscarella 2001, fig. 7
Ayanis	97	2-1	97	Derın & Muscarella 2001, fig. 7
Ayanis	98	2-1	98	Derın & Muscarella 2001, fig. 7
Ayanis	99	2-1	99	Derın & Muscarella 2001, fig. 7
Ayanis	100	2-1	100	Derın & Muscarella 2001, fig. 7
Ayanis	101	2-1	101	Derın & Muscarella 2001, fig. 7
Ayanis	102	2-1	102	Derın & Muscarella 2001, fig. 7
Ayanis	103	2-1	103	Derın & Muscarella 2001, fig. 7
Ayanis	104	2-2	104	Derın & Muscarella 2001, fig. 7
Ayanis	105	2-7	105	Derın & Muscarella 2001, fig. 7
Ayanis	106	2-1	106	Derın & Muscarella 2001, fig. 7
Ayanis	107	3a-11	107	Derın & Muscarella 2001, fig. 7
Ayanis	108	1c-2	108	Derın & Muscarella 2001, fig. 7
Bastam	1	5b-1	73/22	Kroll 1979, p. 154; Abb 1:15
Bastam	2	2-3	74/78	Kroll 1979, p. 154; Abb 3:1
Bastam	3	2-2	75/175	Kroll 1979, p. 158, Abb 3:2
Bastam	4	5a-3	72/31	Kroll 1979, p. 158; Abb 8:15, Taf. 51:2
Bastam	5	5b-1	75/34	Kroll 1979, p. 160; Abb. 9:5
Bastam	6	5a-1?	72/16	Kroll 1979, p. 160, Abb 10:10
Bastam	7	5b-1	74/24	Kroll 1979, p. 160; Abb 11:6
Bastam	8	2-2	72/39	Kroll 1979, p. 162; Abb 10:8
Bastam	9	5a-1?	74/81a	Kroll 1979, p. 164; Abb. 15:5
Bastam	10	3a-5	75/49	Kroll 1979, p. 164; Abb 15:1
Bastam	11	5f-1	74/15	Kroll 1979, p. 164; Abb 16:1
Bastam	12	5a-1?	75/178	Kroll 1979, p. 164; Abb 16:6
Bastam	13	5b-1	73/36	Kroll 1979, p. 166; Abb 16:4
Bastam	14	2-2	75/60	Kroll 1979, p. 166; Abb 16:30
Bastam	15	2-2	75/158	Kroll 1979, p. 166; Abb 16:32
Bastam	16	2-1	75/53	Kroll 1979, p. 166; Abb 16:31
Bastam	17	5a-1?	75/42	Kroll 1979, p. 166; Abb 16:33
Bastam	18	2-2	78/1248	Kroll 1988, p. 157, Abb. 2:3
Bastam	19	2-3	78/1260	Kroll 1988, p. 157, Abb. 2:4
Bastam	20	5b-1	78/1254	Kroll 1988, p. 157, Abb. 3:5
Bastam	21	5y-3	77/209	Kroll 1988, p. 160, Abb. 3:6
Bastam	22	2-1	77/1	Kroll 1988, p. 160, Abb. 3:4, Taf. 37:5
Bastam	23	2-2	78/1295	Kroll 1988, p. 160, Abb. 3:3
Carchemish	1	3a-3	116196	British Museum, 1922-4-11.329
Carchemish	2	3a-3	116199	British Museum, 1922-5-11.332
Carchemish	3	2-3	116195	British Museum, 1922-5-11.328
Carchemish	4	2-3	116200	British Museum, 1922-5-11.333
Carchemish	5	2-3	116198	British Museum, 1922-5-11.331
Carchemish	6	4-18	116191	British Museum, 1922-5-11.324
Carchemish	7	4-18	116193	British Museum, 1922-5-11.326
Carchemish	8	2-3	116197	British Museum, 1922-5-11.330

Site	No.	Type	Item No.	Source
Carchemish	9	4-17	116201	British Museum, 1922-5-11.334
Carchemish	10	4-17	116205	British Museum, 1922-5-11.338
Carchemish	11	4-18	116192	British Museum, 1922-5-11.325
Carchemish	12	3a-14	116203	British Museum, 1922-5-11.336
Carchemish	13	3a-14	116202	British Museum, 1922-5-11.335
Carchemish	14	3a-14	116204	British Museum, 1922-5-11.337
Carchemish	15	2-2	116194	British Museum, 1922-5-11.327
Carchemish	16	2-9	116206	British Museum, 1922-5-11.339
Carchemish	17	3a-2	116208	British Museum, 1922-5-11.341
Carchemish	18	3a-2	116207	British Museum, 1922-5-11.340
Carchemish	19	3a-2	116209	British Museum, 1922-5-11.342
Carchemish	20	5r-1	116211	British Museum, 1922-5-11.344
Carchemish	21	5q-1	116212	British Museum, 1922-5-11.345
Carchemish	22	5a-1	116213	British Museum, 1922-5-11.346
Carchemish	23	5a-1	116214	British Museum, 1922-5-11.347
Carchemish	24	5p-1?	116215	British Museum, 1922-5-11.348(?)
Carchemish	25	5e-20	116216	British Museum, 1922-5-11.349
Carchemish	26	5e-20	116217	British Museum, 1922-5-11.350
Carchemish	27	5a-1?	116218	British Museum, 1922-5-11.351
Carchemish	28	5b-37?	116219	British Museum, 1922-5-11.352
Carchemish	29	5q-1	116220	British Museum, 1922-5-11.353
Carchemish	30	5b-1	116221	British Museum, 1922-5-11.354
Carchemish	31	5p-41	Pl. 22,3	Wooley 1921, Pl. 23,3
Carchemish	32	5b-1?	Pl. 22,4	Wooley 1921, Pl. 23,4
Carchemish	33	5q-1	Pl. 22,5	Wooley 1921, Pl. 23,5
Carchemish	34	5b-1?	Pl. 22,6	Wooley 1921, Pl. 23,6
Carchemish	35	5p-41	Pl. 22,7	Wooley 1921, Pl. 23,7
Carchemish	36	5a-3?	Pl. 22,8	Wooley 1921, Pl. 23,8
Carchemish	37	5p-39	Pl. 22,13	Wooley 1921, Pl. 23,13
Carchemish	38	5p-1	Fig. 20,a	Wooley 1921, Fig. 20,a
Carchemish	39	5f-1	Fig. 20,b	Wooley 1921, Fig. 20,b
Carchemish	40	5a-1	Fig. 20,c	Wooley 1921, Fig. 20,c
Carchemish	41	5p-39	Fig. 20,d	Wooley 1921, Fig. 20,d
Carchemish	42	5p-5	Fig. 20,e	Wooley 1921, Fig. 20,e
Carchemish	43	5p-5	Fig. 20,f	Wooley 1921, Fig. 20,f
Fakhariya	1	5a-28	F237a	McEwan et al 1957, p. 46, pl. 45:3 & 52:17
Fakhariya	2	5a-28	F237b	McEwan et al 1957, p. 46, pl. 45:4
Fakhariya	3	5a-28	F237c	McEwan et al 1957, p. 46, pl. 45:5
Fakhariya	4	5a-28	F237d	McEwan et al 1957, p. 46, pl. 45:5
Fakhariya	5	5a-28	F237e	McEwan et al 1957, p. 46, pl. 45:6
Fakhariya	6	5v-28	F237f	McEwan et al 1957, p. 46, pl. 45:7
Fakhariya	7	5u-28	F237g	McEwan et al 1957, p. 46, pl. 45:8
Fakhariya	8	5v-28	F237h	McEwan et al 1957, p. 46, pl. 45:9
Fakhariya	9	5v-28	F237i	McEwan et al 1957, p. 46, pl. 45:10 & 52:16
Fakhariya	10	5b-1?	F237j	McEwan et al 1957, p. 46, pl. 45:11
Fakhariya	11	5v-28!	F237k	McEwan et al 1957, p. 46, pl. 45:12 & 52:15
Fakhariya	12	5b-5	F237l	McEwan et al 1957, p. 46, pl. 45:13
Fakhariya	13	5a-5	F449	McEwan et al 1957, p. 49, pl. 49:5 & 52:14
Fakhariya	14	5p-2	F450	McEwan et al 1957, p. 49-50, pl. 49:4 & 52:19
Fakhariya	15	5a-1!	F543	McEwan et al 1957, p. 47, pl. 49:3 & 52:18
Gerar	1	1a-2	pl. 23:21	Petrie 1928, pl. 23:21
Gerar	2	5p-1	pl. 23:26	Petrie 1928, pl. 23:26
Gerar	3	5a-1	pl. 23:27	Petrie 1928, pl. 23:27

Site	No.	Type	Item No.	Source
Gerar	4	5p-1	pl. 23:29	Petrie 1928, pl. 23:29
Gerar	5	2-2	pl. 23:30	Petrie 1928, pl. 23:30
Gerar	6	5b-1	pl. 28:04	Petrie 1928, pl. 28:04
Gerar	7	5a-1	pl. 28:05	Petrie 1928, pl. 28:05
Gerar	8	1c-1	pl. 28:13	Petrie 1928, pl. 28:13
Gerar	9	1c-2	pl. 28:14	Petrie 1928, pl. 28:14
Gerar	10	1c-2	pl. 28:15	Petrie 1928, pl. 28:15
Gerar	11	1c-1	pl. 28:16	Petrie 1928, pl. 28:16
Gerar	12	1c-1	pl. 28:17	Petrie 1928, pl. 28:17
Gerar	13	1c-2	pl. 28:18	Petrie 1928, pl. 28:18
Gerar	14	1c-1?	pl. 28:19	Petrie 1928, pl. 28:19
Gerar	15	1c-2	pl. 28:20	Petrie 1928, pl. 28:20
Gerar	16	2-5	pl. 29:01	Petrie 1928, pl. 29:01
Gerar	17	2-3	pl. 29:02	Petrie 1928, pl. 29:02
Gerar	18	2-3	pl. 29:03	Petrie 1928, pl. 29:03
Gerar	19	2-3	pl. 29:04	Petrie 1928, pl. 29:04
Gerar	20	2-3	pl. 29:05	Petrie 1928, pl. 29:05
Gerar	21	2-14	pl. 29:06	Petrie 1928, pl. 29:06
Gerar	22	2-11	pl. 29:07	Petrie 1928, pl. 29:07
Gerar	23	2-5	pl. 29:08	Petrie 1928, pl. 29:08
Gerar	24	2-6	pl. 29:09	Petrie 1928, pl. 29:09
Gerar	25	2-3	pl. 29:10	Petrie 1928, pl. 29:10
Gerar	26	2-1?	pl. 29:11	Petrie 1928, pl. 29:11
Gerar	27	3a-1	pl. 29:12	Petrie 1928, pl. 29:12
Gerar	28	3b-16	pl. 29:13	Petrie 1928, pl. 29:13
Gerar	29	3a-7	pl. 29:14	Petrie 1928, pl. 29:14
Gerar	30	3a-4	pl. 29:15	Petrie 1928, pl. 29:15
Gerar	31	3a-2	pl. 29:16	Petrie 1928, pl. 29:16
Gerar	32	3a-2	pl. 29:17	Petrie 1928, pl. 29:17
Gerar	33	3a-2?	pl. 29:18	Petrie 1928, pl. 29:18
Gerar	34	3a-2	pl. 29:19	Petrie 1928, pl. 29:19
Gerar	35	3a-3	pl. 29:20	Petrie 1928, pl. 29:20
Gerar	36	3b-1	pl. 29:21	Petrie 1928, pl. 29:21
Gerar	37	3b-4	pl. 29:22	Petrie 1928, pl. 29:22
Gerar	38	5a-1	pl. 29:23	Petrie 1928, pl. 29:23
Gerar	39	5a-1	pl. 29:24	Petrie 1928, pl. 29:24
Gerar	40	5a-1	pl. 29:25	Petrie 1928, pl. 29:25
Gerar	41	5a-1	pl. 29:26	Petrie 1928, pl. 29:26
Gerar	42	5a-1	pl. 29:27	Petrie 1928, pl. 29:27
Gerar	43	5a-1	pl. 29:28	Petrie 1928, pl. 29:28
Gerar	44	5a-1?	pl. 29:29	Petrie 1928, pl. 29:29
Gerar	45	5a-1	pl. 29:30	Petrie 1928, pl. 29:30
Gerar	46	5a-1	pl. 29:31	Petrie 1928, pl. 29:31
Gerar	47	5a-1	pl. 29:32	Petrie 1928, pl. 29:32
Gerar	48	5a-1	pl. 29:33	Petrie 1928, pl. 29:33
Gerar	49	5a-1	pl. 29:34	Petrie 1928, pl. 29:34
Gerar	50	5a-1	pl. 29:35	Petrie 1928, pl. 29:35
Gerar	51	5p-1	pl. 29:36	Petrie 1928, pl. 29:36
Gerar	52	5a-1	pl. 29:37	Petrie 1928, pl. 29:37
Gerar	53	5a-1	pl. 29:38	Petrie 1928, pl. 29:38
Gerar	54	5a-3	pl. 29:39	Petrie 1928, pl. 29:39
Gerar	55	5a-1	pl. 29:40	Petrie 1928, pl. 29:40
Gerar	56	5a-1	pl. 29:41	Petrie 1928, pl. 29:41

Site	No.	Type	Item No.	Source
Gerar	57	5a-2	pl. 29:42	Petrie 1928, pl. 29:42
Gerar	58	5a-1	pl. 29:43	Petrie 1928, pl. 29:43
Gerar	59	5a-1	pl. 29:44	Petrie 1928, pl. 29:44
Gerar	60	5a-1	pl. 29:45	Petrie 1928, pl. 29:45
Gerar	61	5a-2	pl. 29:46	Petrie 1928, pl. 29:46
Gerar	62	5a-1	pl. 29:47	Petrie 1928, pl. 29:47
Gerar	63	5a-1	pl. 29:48	Petrie 1928, pl. 29:48
Gerar	64	5a-1	pl. 29:49	Petrie 1928, pl. 29:49
Gerar	65	5p-1	pl. 29:50	Petrie 1928, pl. 29:50
Gerar	66	5p-4	pl. 29:51	Petrie 1928, pl. 29:51
Gerar	67	5q-1!	pl. 29:52	Petrie 1928, pl. 29:52
Gerar	68	5b-1!	pl. 29:53	Petrie 1928, pl. 29:53
Gerar	69	1a-8	pl. 29:54	Petrie 1928, pl. 29:54
Gerar	70	5a-1	pl. 29:55	Petrie 1928, pl. 29:55
Gerar	71	5a-1?	pl. 29:56	Petrie 1928, pl. 29:56
Gerar	72	5p-1?	pl. 29:57	Petrie 1928, pl. 29:57
Gerar	73	5a-1	pl. 29:58	Petrie 1928, pl. 29:58
Gerar	74	5a-14?	pl. 29:59	Petrie 1928, pl. 29:59
Gerar	75	5b-21!	pl. 29:60	Petrie 1928, pl. 29:60
Gerar	76	5p-4	pl. 29:61	Petrie 1928, pl. 29:61
Gerar	77	5p-1?	pl. 29:62	Petrie 1928, pl. 29:62
Gerar	78	1a-4	pl. 29:63	Petrie 1928, pl. 29:63
Gerar	79	1a-4?	pl. 29:64	Petrie 1928, pl. 29:64
Gerar	80	5a-41	pl. 29:65	Petrie 1928, pl. 29:65
Gerar	81	5a-1	pl. 29:66	Petrie 1928, pl. 29:66
Gerar	82	5b-1	pl. 29:67	Petrie 1928, pl. 29:67
Gerar	83	5a-1	pl. 29:68	Petrie 1928, pl. 29:68
Gerar	84	5a-14	pl. 29:69	Petrie 1928, pl. 29:69
Gerar	85	5b-1	pl. 29:70	Petrie 1928, pl. 29:70
Gerar	86	1a-1	pl. 32:12	Petrie 1928, pl. 32:12
Gerar	87	1a-1	pl. 32:13	Petrie 1928, pl. 32:13
Gerar	88	1a-2	pl. 32:15	Petrie 1928, pl. 32:15
Gerar	89	1a-1?	pl. 32:17	Petrie 1928, pl. 32:17
Gerar	90	1a-1?	pl. 32:18	Petrie 1928, pl. 32:18
Gerar	91	1a-1	pl. 32:19	Petrie 1928, pl. 32:19
Gerar	92	1a-1?	pl. 32:21	Petrie 1928, pl. 32:21
Hasanlu	1	5a-2	HAS 60-16	Thornton & Pigott 2011, p. 141, fig. 6.2:1
Hasanlu	2	5a-2	HAS 60-809 b1	Thornton & Pigott 2011, p. 141, fig. 6.2:2
Hasanlu	3	5a-2	HAS 60-809 e1	Thornton & Pigott 2011, p. 141, fig. 6.2:3
Hasanlu	4	5a-1	HAS 60-809 k1	Thornton & Pigott 2011, p. 141, fig. 6.2:4
Hasanlu	5	5a-2	HAS 59-788 b1	Thornton & Pigott 2011, p. 141, fig. 6.2:5
Hasanlu	6	5a-2	HAS 60-809 b2	Thornton & Pigott 2011, p. 141, fig. 6.2:6
Hasanlu	7	5a-2	HAS 62-246	Thornton & Pigott 2011, p. 141, fig. 6.2:7
Hasanlu	8	5a-2	HAS 64-989 d	Thornton & Pigott 2011, p. 141, fig. 6.2:8
Hasanlu	9	5a-19	HAS 74-N 683 y	Thornton & Pigott 2011, p. 141, fig. 6.2:9
Hasanlu	10	5a-2	HAS 74-N683 w	Thornton & Pigott 2011, p. 141, fig. 6.2:10
Hasanlu	11	5a-1	HAS 72-N116 n	Thornton & Pigott 2011, p. 141, fig. 6.2:11
Hasanlu	12	5a-1	HAS 64-989 e	Thornton & Pigott 2011, p. 141, fig. 6.2:12
Hasanlu	13	5f-1	HAS 64-480 c	Thornton & Pigott 2011, p. 141, fig. 6.2:13
Hasanlu	14	5b-19	HAS 74-326	Thornton & Pigott 2011, p. 141, fig. 6.2:14
Hasanlu	15	5a-3?	HAS 59-788 a1	Thornton & Pigott 2011, p. 141, fig. 6.2:15
Hasanlu	16	5a-1	HAS 72-N136 b	Thornton & Pigott 2011, p. 141, fig. 6.2:16
Hasanlu	17	5a-4	HAS 60-223	Thornton & Pigott 2011, p. 141, fig. 6.2:17

Site	No.	Type	Item No.	Source
Hasanlu	18	5e-1	HAS 74-276	Thornton & Pigott 2011, p. 142, fig. 6.3:1
Hasanlu	19	5b-1	HAS 62-1086 a	Thornton & Pigott 2011, p. 142, fig. 6.3:2
Hasanlu	20	5b-1	HAS 70-206	Thornton & Pigott 2011, p. 142, fig. 6.3:3
Hasanlu	21	5b-1	HAS 72-N136 a	Thornton & Pigott 2011, p. 142, fig. 6.3:4
Hasanlu	22	5q-1	HAS 70-645	Thornton & Pigott 2011, p. 142, fig. 6.3:5
Hasanlu	23	5b-1	HAS 72-N444 b	Thornton & Pigott 2011, p. 142, fig. 6.3:6
Hasanlu	24	5a-1	HAS 64-989 a	Thornton & Pigott 2011, p. 142, fig. 6.3:7
Hasanlu	25	5b-1	HAS 62-1043 a	Thornton & Pigott 2011, p. 142, fig. 6.3:8
Hasanlu	26	5b-1	HAS 72-N116 L	Thornton & Pigott 2011, p. 142, fig. 6.3:9
Hasanlu	27	5a-1	HAS 70-345	Thornton & Pigott 2011, p. 142, fig. 6.3:10
Hasanlu	28	5b-1	HAS 62-156	Thornton & Pigott 2011, p. 142, fig. 6.3:11
Hasanlu	29	5a-1	HAS 72-N274 h	Thornton & Pigott 2011, p. 142, fig. 6.3:12
Hasanlu	30	5a-1	HAS 62-48	Thornton & Pigott 2011, p. 142, fig. 6.3:13
Hasanlu	31	5a-1?	HAS 70-D8	Thornton & Pigott 2011, p. 142, fig. 6.3:14
Hasanlu	32	5b-1	HAS 74-N683 r	Thornton & Pigott 2011, p. 142, fig. 6.3:15
Hasanlu	33	5a-1?	HAS 74-N683 a	Thornton & Pigott 2011, p. 142, fig. 6.3:16
Hasanlu	34	5q-1	HAS 74-427 c	Thornton & Pigott 2011, p. 142, fig. 6.3:17
Hasanlu	35	2-2!	HAS 72-N294 a	Thornton & Pigott 2011, p. 143, fig. 6.4:1
Hasanlu	36	2-2!	HAS 72-N236 b	Thornton & Pigott 2011, p. 143, fig. 6.4:2
Hasanlu	37	2-2!	HAS 72-N114 b	Thornton & Pigott 2011, p. 143, fig. 6.4:3
Hasanlu	38	2-2!	HAS 72-N444 a	Thornton & Pigott 2011, p. 143, fig. 6.4:4
Hasanlu	39	2-2	HAS 62-1043 b	Thornton & Pigott 2011, p. 143, fig. 6.4:5
Hasanlu	40	5a-5	HAS 64-989 b	Thornton & Pigott 2011, p. 144, fig. 6.5:1
Hasanlu	41	5b-5	HAS 74-437	Thornton & Pigott 2011, p. 144, fig. 6.5:2
Hasanlu	42	5a-9?	HAS 64-308	Thornton & Pigott 2011, p. 144, fig. 6.5:3
Hasanlu	43	5b-5	HAS 70-190	Thornton & Pigott 2011, p. 144, fig. 6.5:4
Hasanlu	44	5b-6	HAS 62-991	Thornton & Pigott 2011, p. 144, fig. 6.5:5
Hasanlu	45	5b-6?	HAS 60-102	Thornton & Pigott 2011, p. 144, fig. 6.5:6
Hasanlu	46	5b-6	HAS 60-33	Thornton & Pigott 2011, p. 144, fig. 6.5:7
Hasanlu	47	7d	HAS 72-170	Thornton & Pigott 2011, p. 144, fig. 6.5:8
Hasanlu	48	1a-2	HAS 74-N719	Thornton & Pigott 2011, p. 145, fig. 6.6:1
Hasanlu	49	1a-2	HAS 72-N274 a	Thornton & Pigott 2011, p. 145, fig. 6.6:2
Hasanlu	50	1a-2	HAS 59-788 d	Thornton & Pigott 2011, p. 145, fig. 6.6:3
Hasanlu	51	1c-1	HAS 74-N677b	Thornton & Pigott 2011, p. 145, fig. 6.6:4
Hasanlu	52	1c-1?	UPM 57-71	Thornton & Pigott 2011, p. 145, fig. 6.6:5
Hasanlu	53	1c-2	HAS 72-N73b	Thornton & Pigott 2011, p. 145, fig. 6.6:6
Hasanlu	54	5p-5	HAS 74-269	Thornton & Pigott 2011, p. 145, fig. 6.6:7
Hasanlu	55	5p-1!	HAS 60-709	Thornton & Pigott 2011, p. 145, fig. 6.6:8
Hasanlu	56	5v-1!	HAS 60-710	Thornton & Pigott 2011, p. 145, fig. 6.6:9
Hasanlu	57	5a-1	HAS 60-871 b	Thornton & Pigott 2011, p. 145, fig. 6.6:10
Hasanlu	58	5u-1?	HAS 57-133	Thornton & Pigott 2011, p. 145, fig. 6.6:11
Hasanlu	59	5q-8	HAS 62-853	Thornton & Pigott 2011, p. 145, fig. 6.6:12
Hasanlu	60	5q-5!	HAS 72-107	Thornton & Pigott 2011, p. 145, fig. 6.6:13
Hasanlu	61	5q-5	HAS 62-1040	Thornton & Pigott 2011, p. 145, fig. 6.6:14
Hasanlu	62	5r-5	HAS 60-711	Thornton & Pigott 2011, p. 145, fig. 6.6:15
Hasanlu	63	5q-4	HAS 62-1052	Thornton & Pigott 2011, p. 145, fig. 6.6:16
Hasanlu	64	5a-5	HAS 62-882	Thornton & Pigott 2011, p. 145, fig. 6.6:17
Hasanlu	65	5q-5	HAS 72-N195 A	Thornton & Pigott 2011, p. 145, fig. 6.6:18
Hasanlu	66	5a-1	HAS 60-871 a	Thornton & Pigott 2011, p. 145, fig. 6.6:19
Hasanlu	67	5a-1	HAS 60-909	0hornton & Pigott 2011, p. 145, fig. 6.6:20
Hasanlu	68	1c-1	HAS 64-585	Thornton & Pigott 2011, p. 145, fig. 6.6:21
Hasanlu	69	9	HAS 70-516	Thornton & Pigott 2011, p. 146, fig. 6.7:1
Hasanlu	70	9	HAS 62-671	Thornton & Pigott 2011, p. 146, fig. 6.7:2

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Hasanlu	71	9	HAS 70-284	Thornton & Pigott 2011, p. 146, fig. 6.7:3
Hasanlu	72	9	HAS 74-422	Thornton & Pigott 2011, p. 146, fig. 6.7:4
Hasanlu	73	9	HAS 72-21	Thornton & Pigott 2011, p. 146, fig. 6.7:5
Hasanlu	74	9	HAS 60-38	Thornton & Pigott 2011, p. 146, fig. 6.7:6
Hasanlu	75	9	HAS 62-1088	Thornton & Pigott 2011, p. 146, fig. 6.7:7
Hasanlu	76	9	HAS 70-286	Thornton & Pigott 2011, p. 146, fig. 6.7:8
Hasanlu	77	9	HAS 60-77	Thornton & Pigott 2011, p. 146, fig. 6.7:9
Hasanlu	78	9	HAS 61-410	Thornton & Pigott 2011, p. 146, fig. 6.7:10
Hasanlu	79	9	HAS 70-556	Thornton & Pigott 2011, p. 146, fig. 6.7:11
Hasanlu	80	9	HAS 60-80	Thornton & Pigott 2011, p. 146, fig. 6.7:12
Hasanlu	81	9	HAS 59-267	Thornton & Pigott 2011, p. 146, fig. 6.7:13
Hasanlu	82	9	HAS 74-N676	Thornton & Pigott 2011, p. 146, fig. 6.7:14
Hasanlu	83	9	HAS 70-285	Thornton & Pigott 2011, p. 146, fig. 6.7:15
Hasanlu	84	9	HAS 72-60	Thornton & Pigott 2011, p. 146, fig. 6.7:16
Hasanlu	85	2-5	HAS 60-316	Thornton & Pigott 2011, p. 168, fig. 6.31:1
Hasanlu	86	2-14	HAS 74-26	Thornton & Pigott 2011, p. 168, fig. 6.31:2
Hasanlu	87	2-14	HAS 72-N346	Thornton & Pigott 2011, p. 168, fig. 6.31:3
Hasanlu	88	3a-3	HAS 72-71	Thornton & Pigott 2011, p. 168, fig. 6.31:4
Hasanlu	89	3b-2	HAS 58-58	Thornton & Pigott 2011, p. 168, fig. 6.31:5
Hasanlu	90	3a-3	HAS 72-8	Thornton & Pigott 2011, p. 168, fig. 6.31:6
Hasanlu	91	3a-19	HAS 74-N9	Thornton & Pigott 2011, p. 168, fig. 6.31:7
Hasanlu	92	2-2	HAS 62-25	Thornton & Pigott 2011, p. 168, fig. 6.31:8
Igdyr	1	5b-1	fig. 37:4	Barnett 1963, p. 186; fig. 37:4
Igdyr	2	5b-1	fig. 37:5	Barnett 1963, p. 186; fig. 37:5
Igdyr	3	5b-1	fig. 37:6	Barnett 1963, p. 186; fig. 37:6
Igdyr	4	5b-1	fig. 37:7	Barnett 1963, p. 186; fig. 37:7
Igdyr	5	5b-1	fig. 37:11	Barnett 1963, p. 186; fig. 37:11
Karchaghbyur	1	5p-8	pl. 5:4	Yengibaryan 2002, p. 420, pl. 5:4
Karchaghbyur	2	5p-4	pl. 5:5	Yengibaryan 2002, p. 420, pl. 5:5
Karchaghbyur	3	9	pl. 6:6	Yengibaryan 2002, p. 420, pl. 6:6
Karchaghbyur	4	5g-5	pl. 14:1	Yengibaryan 2002, p. 423; pl. 14:1
Karchaghbyur	5	5p-7	pl. 16:1	Yengibaryan 2002, p. 423, pl. 16:1
Karchaghbyur	6	5p-8	pl. 16:2	Yengibaryan 2002, p. 423, pl. 16:2
Karchaghbyur	7	5p-8	pl. 16:3	Yengibaryan 2002, p. 423, pl. 16:3
Karchaghbyur	8	5p-5	pl. 16:4	Yengibaryan 2002, p. 423, pl. 16:4
Karchaghbyur	9	3a-2?	pl. 16:5	Yengibaryan 2002, p. 423, pl. 16:5
Lachish	1	5a-1	338	Tufnell et al 1953, p. 186, pl. 54:46
Lachish	2	5a-1	285	Tufnell et al 1953, p. 186, pl. 54:47
Lachish	3	1a-1	283	Tufnell et al 1953, p. 186, pl. 54:48
Lachish	4	5a-1	286	Tufnell et al 1953, p. 186, pl. 54:49
Lachish	5	5a-1	288	Tufnell et al 1953, p. 186, pl. 54:50
Lachish	6	5a-1	355	Tufnell et al 1953, p. 187, pl. 54:51
Lachish	7	5a-10	289	Tufnell et al 1953, p. 186, pl. 54:52
Lachish	8	5a-30!	341	Tufnell et al 1953, p. 186, pl. 54:53
Lachish	9	5a-1	5144	Tufnell et al 1953, p. 196, pl. 55:12
Lachish	10	9	6825	Tufnell et al 1953, p. 119, pl. 63:16
Lachish	11	9	6826	Tufnell et al 1953, p. 119, pl. 63:17
Lachish	12	9	6827	Tufnell et al 1953, p. 119, pl. 63:18
Lachish	13	5a-1	5440	Tufnell et al 1953, p. 106; pl. 60:1
Lachish	14	5a-1	5479	Tufnell et al 1953, p. 106-7; pl. 60:2
Lachish	15	5a-1	5480	Tufnell et al 1953, p. 106-7; pl. 60:3
Lachish	16	5a-1	5481	Tufnell et al 1953, p. 106-7; pl. 60:4 & Gottlieb 2004, p. 1947, fig. 27.18:7

Site	No.	Type	Item No.	Source
Lachish	17	5b-1	5481	Tufnell et al 1953, p. 106-7; pl. 60:5 & Gottlieb 2004, p. 1945, fig. 27.17:11
Lachish	18	5a-1	5482	Tufnell et al 1953, p. 106-7; pl. 60:6
Lachish	19	5a-1	5484	Tufnell et al 1953, p. 106-7; pl. 60:7
Lachish	20	1a-1	5478	Tufnell et al 1953, p. 106-7; pl. 60:8 & Gottlieb 2004, p. 1943, fig. 27.16:2
Lachish	21	5b-1?	Pl. 60,9	Tufnell et al 1953, p. 109, pl. 60:9
Lachish	22	5a-1	6229	Tufnell et al 1953, p. 111, pl. 60:10
Lachish	23	5a-1	6230	Tufnell et al 1953, p. 111, pl. 60:11
Lachish	24	5a-1	6231	Tufnell et al 1953, p. 111, pl. 60:12 & Gottlieb 2004, p. 1945, fig. 27.17:12
Lachish	25	5q-1	Pl. 60,13	Tufnell et al 1953, p. 111, pl. 60:13
Lachish	26	5a-1	Pl. 60,14	Tufnell et al 1953, p. 113, pl. 60:14 & Gottlieb 2004, p. 1949, fig. 27.19:7
Lachish	27	5a-1	6261	Tufnell et al 1953, p. 114, pl. 60:15
Lachish	28	5a-1	6291	Tufnell et al 1953, p. 115, pl. 60:16
Lachish	29	5a-1	6289	Tufnell et al 1953, p. 115, pl. 60:17 & Gottlieb 2004, p. 1947, fig. 27.18:1
Lachish	30	5a-1	6290	Tufnell et al 1953, p. 115, pl. 60:18
Lachish	31	5a-1	6292	Tufnell et al 1953, p. 115, pl. 60:19 & Gottlieb 2004, p. 1947, fig. 27.18:16
Lachish	32	5b-1!	6293	Tufnell et al 1953, p. 115, pl. 60:20 & Gottlieb 2004, p. 1949, fig. 27.19:8
Lachish	33	5a-1	6294	Tufnell et al 1953, p. 115, pl. 60:21 & Gottlieb 2004, p. 1949, fig. 27.19:9
Lachish	34	5a-1	6786	Tufnell et al 1953, p. 117, pl. 60:22 & Gottlieb 2004, p. 1947, fig. 27.18:18
Lachish	35	5a-1	6828	Tufnell et al 1953, p. 119, pl. 60:23
Lachish	36	1c-1	6829	Tufnell et al 1953, p. 119, pl. 60:24 & Gottlieb 2004, p. 1943, fig. 27.16:6
Lachish	37	5b-1	6830	Tufnell et al 1953, p. 119, pl. 60:25
Lachish	38	5b-1	6838	Tufnell et al 1953, p. 120, pl. 60:26 & Gottlieb 2004, p. 1945, fig. 27.17:6
Lachish	39	5b-1	6839	Tufnell et al 1953, p. 120, pl. 60:27
Lachish	40	5a-1	7081	Tufnell et al 1953, p. 121-2, pl. 60:28
Lachish	41	5a-1	7093	Tufnell et al 1953, p. 122, pl. 60:29
Lachish	42	5a-1?	7092	Tufnell et al 1953, p. 122, pl. 60:30
Lachish	43	5a-1	7107	Tufnell et al 1953, p. 123, pl. 60:31 & Gottlieb 2004, p. 1943, fig. 27.16:15
Lachish	44	5b-1	7108	Tufnell et al 1953, p. 123, pl. 60:32 & Gottlieb 2004, p. 1945, fig. 27.17:8
Lachish	45	5a-1	7114	Tufnell et al 1953, p. 123, pl. 60:33
Lachish	46	5a-1	7121	Tufnell et al 1953, p. 123, pl. 60:34
Lachish	47	5a-1	7129	Tufnell et al 1953, p. 124, pl. 60:35
Lachish	48	5a-1	7132	Tufnell et al 1953, p. 124, pl. 60:36 & Gottlieb 2004, p. 1947, fig. 27.18:2
Lachish	49	5a-1	7133	Tufnell et al 1953, p. 124, pl. 60:37
Lachish	50	5a-1?	7134	Tufnell et al 1953, p. 124, pl. 60:38
Lachish	51	5a-1	7139	Tufnell et al 1953, p. 124, pl. 60:39
Lachish	52	5a-1	7139a	Tufnell et al 1953, p. 124, pl. 60:40
Lachish	53	5a-1	7140	Tufnell et al 1953, p. 124, pl. 60:41 & Gottlieb 2004, p. 1947, fig. 27.18:10
Lachish	54	5a-1	7141	Tufnell et al 1953, p. 124, pl. 60:42
Lachish	55	5a-1	7157	Tufnell et al 1953, p. 124, pl. 60:43 & Gottlieb 2004, p. 1943, fig. 27.16:14

Site	No.	Type	Item No.	Source
Lachish	56	5a-1	7158	Tufnell et al 1953, p. 124, pl. 60:44
Lachish	57	5a-1	7173	Tufnell et al 1953, p. 125, pl. 60:45
Lachish	58	5a-1	7061	Tufnell et al 1953, p. 121, pl. 60:48 & Gottlieb 2004, p. 1949, fig. 27.19:18
Lachish	59	5a-1	7056	Tufnell et al 1953, p. 121, pl. 60:49 & Gottlieb 2004, p. 1949, fig. 27.19:14
Lachish	60	5a-1	7057	Tufnell et al 1953, p. 121, pl. 60:50
Lachish	61	5a-1	7055	Tufnell et al 1953, p. 121, pl. 60:51 & Gottlieb 2004, p. 1943, fig. 27.16:16
Lachish	62	1a-1	7063	Tufnell et al 1953, p. 121, pl. 60:62 & Gottlieb 2004, p. 1943, fig. 27.16:1
Lachish	63	5a-1	7060	Tufnell et al 1953, p. 121, pl. 60:63
Lachish	64	5a-1	7059	Tufnell et al 1953, p. 121, pl. 60:64
Lachish	65	5a-1	586/60	Rothenberg 1975, p. 74, pl. 36:1
Lachish	66	5b-1	350/60	Rothenberg 1975, p. 74, pl. 36:2
Lachish	67	5b-1?	425/60	Rothenberg 1975, p. 74, pl. 36:3
Lachish	68	5b-1	315/60	Rothenberg 1975, p. 75, pl. 29:1 & 36:4
Lachish	69	5?	449/61	Rothenberg 1975, p. 75, pl. 36:5
Lachish	70	5g-1	256/61	Rothenberg 1975, p. 75, pl. 29:3 & 36:6
Lachish	71	5g-1?	913/60	Rothenberg 1975, p. 75, pl. 29:2 & 36:7
Lachish	72	5a-1?	510/60	Rothenberg 1975, p. 75, pl. 36:8
Lachish	73	1c-1	135/6B	Rothenberg 1975, p. 75, pl. 36:9
Lachish	74	1c-1?	135/61A	Rothenberg 1975, p. 75, pl. 36:10
Lachish	75	1c-1?	104/63	Rothenberg 1975, p. 75, pl. 36:11
Lachish	76	1c-2	104/61	Rothenberg 1975, p. 75, pl. 36:12
Lachish	77	1c-2	104/62	Rothenberg 1975, p. 75, pl. 29:4 & 36:13
Lachish	78	1c-2	97/61	Rothenberg 1975, p. 76, pl. 36:14
Lachish	79	5b-1	40296/60	Gottlieb 2004, p. 1911, fig. 27.1:2
Lachish	80	5a-1	8281/60	Gottlieb 2004, p. 1911, fig. 27.1:3
Lachish	81	5q-1	40999/60	Gottlieb 2004, p. 1911, fig. 27.1:7
Lachish	82	9	31072/40	Gottlieb 2004, p. 1911, fig. 27.1:8
Lachish	83	9	60805/40	Gottlieb 2004, p. 1911, fig. 27.1:10
Lachish	84	9	61982/40	Gottlieb 2004, p. 1911, fig. 27.1:11
Lachish	85	9	62113/40	Gottlieb 2004, p. 1911, fig. 27.1:12
Lachish	86	5b-1	40701/60	Gottlieb 2004, p. 1911, fig. 27.1:15
Lachish	87	5a-28?	41588/60	Gottlieb 2004, p. 1911, fig. 27.1:16
Lachish	88	5b-1	40052/60	Gottlieb 2004, p. 1911, fig. 27.1:17
Lachish	89	5b-1	8525/60	Gottlieb 2004, p. 1911, fig. 27.1:18
Lachish	90	5b-1	8969/60	Gottlieb 2004, p. 1911, fig. 27.1:19
Lachish	91	5b-1	31801/64	Gottlieb 2004, p. 1915, fig. 27.2:1
Lachish	92	5b-1?	31801/66	Gottlieb 2004, p. 1915, fig. 27.2:2
Lachish	93	5a-1?	31801/65	Gottlieb 2004, p. 1915, fig. 27.2:3
Lachish	94	5b-1	31801/60	Gottlieb 2004, p. 1915, fig. 27.2:4
Lachish	95	5b-1	31801/61	Gottlieb 2004, p. 1915, fig. 27.2:5
Lachish	96	5b-1?	31801/68	Gottlieb 2004, p. 1915, fig. 27.2:6
Lachish	97	5b-1	31801/67	Gottlieb 2004, p. 1915, fig. 27.2:7
Lachish	98	5b-1	31801/62	Gottlieb 2004, p. 1915, fig. 27.2:8
Lachish	99	5b-1	8226/60	Gottlieb 2004, p. 1915, fig. 27.2:9
Lachish	100	5b-1	10406/60	Gottlieb 2004, p. 1915, fig. 27.2:10
Lachish	101	5b-1	30050/60	Gottlieb 2004, p. 1915, fig. 27.2:11
Lachish	102	5b-1	10873/60	Gottlieb 2004, p. 1915, fig. 27.2:12
Lachish	103	5a-1	39020/60	Gottlieb 2004, p. 1915, fig. 27.2:13
Lachish	104	5b-1	35130/60	Gottlieb 2004, p. 1915, fig. 27.2:15
Lachish	105	5b-1	38100/60	Gottlieb 2004, p. 1915, fig. 27.2:16

Site	No.	Type	Item No.	Source
Lachish	106	5b-1	8488/60	Gottlieb 2004, p. 1915, fig. 27.2:17
Lachish	107	5b-1	31284/60	Gottlieb 2004, p. 1917, fig. 27.3:1
Lachish	108	5b-1	8810/60	Gottlieb 2004, p. 1917, fig. 27.3:2
Lachish	109	5b-1	38838/60	Gottlieb 2004, p. 1917, fig. 27.3:3
Lachish	110	5b-1	8517/60	Gottlieb 2004, p. 1917, fig. 27.3:4
Lachish	111	5b-1	31569/60	Gottlieb 2004, p. 1917, fig. 27.3:5
Lachish	112	5b-1	39151/60	Gottlieb 2004, p. 1917, fig. 27.3:6
Lachish	113	5b-1	31287/60	Gottlieb 2004, p. 1917, fig. 27.3:7
Lachish	114	5b-1	10245/60	Gottlieb 2004, p. 1917, fig. 27.3:8
Lachish	115	5b-1	10189/60	Gottlieb 2004, p. 1917, fig. 27.3:9
Lachish	116	5b-1	39097/60	Gottlieb 2004, p. 1917, fig. 27.3:10
Lachish	117	5q-1	31534/60	Gottlieb 2004, p. 1917, fig. 27.3:11
Lachish	118	5q-1	38867/60	Gottlieb 2004, p. 1917, fig. 27.3:12
Lachish	119	5q-1	31546/60	Gottlieb 2004, p. 1917, fig. 27.3:13
Lachish	120	5q-1	38671/60	Gottlieb 2004, p. 1917, fig. 27.3:14
Lachish	121	5a-1	39092/60	Gottlieb 2004, p. 1917, fig. 27.3:16
Lachish	122	5b-1	38829/60	Gottlieb 2004, p. 1917, fig. 27.3:17
Lachish	123	5b-1	38082/60	Gottlieb 2004, p. 1917, fig. 27.3:18
Lachish	124	5a-1	39017/61	Gottlieb 2004, p. 1919, fig. 27.4:1
Lachish	125	5a-1	31522/60	Gottlieb 2004, p. 1919, fig. 27.4:2
Lachish	126	5b-1	10520/60	Gottlieb 2004, p. 1919, fig. 27.4:3
Lachish	127	5b-1	31290/60	Gottlieb 2004, p. 1919, fig. 27.4:4
Lachish	128	5b-1	31399/60	Gottlieb 2004, p. 1919, fig. 27.4:5
Lachish	129	5a-1	10869/60	Gottlieb 2004, p. 1919, fig. 27.4:6
Lachish	130	5a-1	30893/60	Gottlieb 2004, p. 1919, fig. 27.4:7
Lachish	131	5b-1	10852/60	Gottlieb 2004, p. 1919, fig. 27.4:8
Lachish	132	5a-1	31433/60	Gottlieb 2004, p. 1919, fig. 27.4:9
Lachish	133	5b-1	10327/60	Gottlieb 2004, p. 1919, fig. 27.4:10
Lachish	134	5b-1	39438/61	Gottlieb 2004, p. 1919, fig. 27.4:11
Lachish	135	1a-2	39205/60	Gottlieb 2004, p. 1919, fig. 27.4:12
Lachish	136	1a-1?	30567/60	Gottlieb 2004, p. 1919, fig. 27.4:13
Lachish	137	1a-1	31608	Gottlieb 2004, p. 1919, fig. 27.4:14
Lachish	138	1c-1	8847/60	Gottlieb 2004, p. 1919, fig. 27.4:15
Lachish	139	1c-2	11155/60	Gottlieb 2004, p. 1919, fig. 27.4:16
Lachish	140	1c-1	10279/60	Gottlieb 2004, p. 1919, fig. 27.4:17
Lachish	141	1c-1?	10202/60	Gottlieb 2004, p. 1919, fig. 27.4:19
Lachish	142	1c-1?	10289/60	Gottlieb 2004, p. 1919, fig. 27.4:20
Lachish	143	5b-1	61010/60	Gottlieb 2004, p. 1921, fig. 27.5:1
Lachish	144	5b-1	61827/60	Gottlieb 2004, p. 1921, fig. 27.5:2
Lachish	145	5b-1	60648/60	Gottlieb 2004, p. 1921, fig. 27.5:3
Lachish	146	5b-1	61963/60	Gottlieb 2004, p. 1921, fig. 27.5:4
Lachish	147	5a-1	61816/60	Gottlieb 2004, p. 1921, fig. 27.5:5
Lachish	148	5b-1	60734/60	Gottlieb 2004, p. 1921, fig. 27.5:6
Lachish	149	5q-1	62203/60	Gottlieb 2004, p. 1921, fig. 27.5:7
Lachish	150	5b-1	62255/60	Gottlieb 2004, p. 1921, fig. 27.5:8
Lachish	151	5b-2	61478/60	Gottlieb 2004, p. 1921, fig. 27.5:9
Lachish	152	5b-1	61961/60	Gottlieb 2004, p. 1921, fig. 27.5:10
Lachish	153	5b-1	61269/60	Gottlieb 2004, p. 1921, fig. 27.5:11
Lachish	154	5b-1	62236/60	Gottlieb 2004, p. 1921, fig. 27.5:12
Lachish	155	5b-1	62194/60	Gottlieb 2004, p. 1921, fig. 27.5:13
Lachish	156	5b-1	61815/60	Gottlieb 2004, p. 1921, fig. 27.5:14
Lachish	157	5b-1	62251	Gottlieb 2004, p. 1921, fig. 27.5:16
Lachish	158	5b-1	60765/60	Gottlieb 2004, p. 1921, fig. 27.5:17

Site	No.	Type	Item No.	Source
Lachish	159	5b-1	60999/60	Gottlieb 2004, p. 1921, fig. 27.5:18
Lachish	160	5b-1	60611/60	Gottlieb 2004, p. 1921, fig. 27.5:19
Lachish	161	5b-1	61825/60	Gottlieb 2004, p. 1921, fig. 27.5:20
Lachish	162	5b-1	60550/60	Gottlieb 2004, p. 1923, fig. 27.6:1
Lachish	163	5b-1	60741/60	Gottlieb 2004, p. 1923, fig. 27.6:2
Lachish	164	5b-1?	60330/60	Gottlieb 2004, p. 1923, fig. 27.6:3
Lachish	165	5b-1?	61744/60	Gottlieb 2004, p. 1923, fig. 27.6:4
Lachish	166	5b-1	62260	Gottlieb 2004, p. 1923, fig. 27.6:5
Lachish	167	5b-1	61800/60	Gottlieb 2004, p. 1923, fig. 27.6:6
Lachish	168	5b-1	60763/60	Gottlieb 2004, p. 1923, fig. 27.6:7
Lachish	169	5b-1	62185	Gottlieb 2004, p. 1923, fig. 27.6:8
Lachish	170	5b-1	60872/60	Gottlieb 2004, p. 1923, fig. 27.6:9
Lachish	171	5b-1	61900/60	Gottlieb 2004, p. 1923, fig. 27.6:10
Lachish	172	5b-1	62015/60	Gottlieb 2004, p. 1923, fig. 27.6:11
Lachish	173	5a-1	61929/60	Gottlieb 2004, p. 1923, fig. 27.6:12
Lachish	174	5b-1	62022/60	Gottlieb 2004, p. 1923, fig. 27.6:13
Lachish	175	5a-1?	60953/60	Gottlieb 2004, p. 1923, fig. 27.6:14
Lachish	176	5a-2	62008/60	Gottlieb 2004, p. 1923, fig. 27.6:15
Lachish	177	1c-1?	61194/60	Gottlieb 2004, p. 1923, fig. 27.6:16
Lachish	178	1c-1?	60547/60	Gottlieb 2004, p. 1923, fig. 27.6:17
Lachish	179	1a-2	61753	Gottlieb 2004, p. 1923, fig. 27.6:18
Lachish	180	1a-1	60711/60	Gottlieb 2004, p. 1923, fig. 27.6:19
Lachish	181	1a-1	61643	Gottlieb 2004, p. 1923, fig. 27.6:20
Lachish	182	5b-1	60592/60	Gottlieb 2004, p. 1925, fig. 27.7:1
Lachish	183	5b-1	60557/60	Gottlieb 2004, p. 1925, fig. 27.7:2
Lachish	184	5b-1	61368/60	Gottlieb 2004, p. 1925, fig. 27.7:3
Lachish	185	5b-1	60409/60	Gottlieb 2004, p. 1925, fig. 27.7:4
Lachish	186	5b-1	61101/60	Gottlieb 2004, p. 1925, fig. 27.7:5
Lachish	187	5b-1	61819/60	Gottlieb 2004, p. 1925, fig. 27.7:6
Lachish	188	5a-1	62232/60	Gottlieb 2004, p. 1925, fig. 27.7:7
Lachish	189	5a-1	60623/60	Gottlieb 2004, p. 1925, fig. 27.7:8
Lachish	190	5a-1	61807/60	Gottlieb 2004, p. 1925, fig. 27.7:9
Lachish	191	5a-2	61309/60	Gottlieb 2004, p. 1925, fig. 27.7:10
Lachish	192	5b-1	60584/60	Gottlieb 2004, p. 1925, fig. 27.7:11
Lachish	193	5b-1	61583/60	Gottlieb 2004, p. 1925, fig. 27.7:12
Lachish	194	5a-1	61086/60	Gottlieb 2004, p. 1925, fig. 27.7:13
Lachish	195	5a-1	60740/60	Gottlieb 2004, p. 1925, fig. 27.7:14
Lachish	196	5b-1	60782/60	Gottlieb 2004, p. 1925, fig. 27.7:15
Lachish	197	5a-1	91738/1	Gottlieb 2004, p. 1925, fig. 27.7:16
Lachish	198	5a-1	61813/60	Gottlieb 2004, p. 1925, fig. 27.7:17
Lachish	199	5b-1	61607/60	Gottlieb 2004, p. 1925, fig. 27.7:18
Lachish	200	5b-1	61373/60	Gottlieb 2004, p. 1925, fig. 27.7:19
Lachish	201	5b-1	60890	Gottlieb 2004, p. 1925, fig. 27.7:20
Lachish	202	5b-1	61289/60	Gottlieb 2004, p. 1927, fig. 27.8:1
Lachish	203	5b-1	61498/60	Gottlieb 2004, p. 1927, fig. 27.8:2
Lachish	204	5b-1	61211/60	Gottlieb 2004, p. 1927, fig. 27.8:3
Lachish	205	5b-1	61912	Gottlieb 2004, p. 1927, fig. 27.8:4
Lachish	206	5a-1?	61622/60	Gottlieb 2004, p. 1927, fig. 27.8:5
Lachish	207	5b-1	60607/60	Gottlieb 2004, p. 1927, fig. 27.8:6
Lachish	208	5b-1	60396/60	Gottlieb 2004, p. 1927, fig. 27.8:7
Lachish	209	5b-1	61367/60	Gottlieb 2004, p. 1927, fig. 27.8:8
Lachish	210	5b-1	61040	Gottlieb 2004, p. 1927, fig. 27.8:9
Lachish	211	5b-1	61793/60	Gottlieb 2004, p. 1927, fig. 27.8:10

Site	No.	Type	Item No.	Source
Lachish	212	5a-1	60753/60	Gottlieb 2004, p. 1927, fig. 27.8:11
Lachish	213	5b-1	61062/60	Gottlieb 2004, p. 1927, fig. 27.8:12
Lachish	214	5b-1	60802/60	Gottlieb 2004, p. 1927, fig. 27.8:13
Lachish	215	5b-1?	61960/60	Gottlieb 2004, p. 1927, fig. 27.8:14
Lachish	216	5a-2	61041/60	Gottlieb 2004, p. 1927, fig. 27.8:15
Lachish	217	5b-1	61923/60	Gottlieb 2004, p. 1927, fig. 27.8:16
Lachish	218	5b-1	60376/60	Gottlieb 2004, p. 1927, fig. 27.8:17
Lachish	219	5b-1	61220/60	Gottlieb 2004, p. 1927, fig. 27.8:18
Lachish	220	5b-1	62207/60	Gottlieb 2004, p. 1927, fig. 27.8:19
Lachish	221	5b-1	61908/60	Gottlieb 2004, p. 1927, fig. 27.8:20
Lachish	222	5b-1	61991/60	Gottlieb 2004, p. 1927, fig. 27.8:21
Lachish	223	5b-1?	60821/60	Gottlieb 2004, p. 1929, fig. 27.9:1
Lachish	224	5b-1	61661/60	Gottlieb 2004, p. 1929, fig. 27.9:2
Lachish	225	5b-1	62090/60	Gottlieb 2004, p. 1929, fig. 27.9:3
Lachish	226	5b-1	61972/60	Gottlieb 2004, p. 1929, fig. 27.9:4
Lachish	227	5b-1	92023/60	Gottlieb 2004, p. 1929, fig. 27.9:5
Lachish	228	5b-1	61250/60	Gottlieb 2004, p. 1929, fig. 27.9:6
Lachish	229	5b-1	62155/60	Gottlieb 2004, p. 1929, fig. 27.9:7
Lachish	230	5b-1	61131/60	Gottlieb 2004, p. 1929, fig. 27.9:8
Lachish	231	5b-1	61603/60	Gottlieb 2004, p. 1929, fig. 27.9:9
Lachish	232	5b-1	62116/60	Gottlieb 2004, p. 1929, fig. 27.9:10
Lachish	233	5b-1	60634/60	Gottlieb 2004, p. 1929, fig. 27.9:11
Lachish	234	5a-1	61957/60	Gottlieb 2004, p. 1929, fig. 27.9:12
Lachish	235	5a-1	61308/60	Gottlieb 2004, p. 1929, fig. 27.9:13
Lachish	236	5b-1	62223	Gottlieb 2004, p. 1929, fig. 27.9:14
Lachish	237	5b-1	61759/60	Gottlieb 2004, p. 1929, fig. 27.9:15
Lachish	238	5b-1	60375/60	Gottlieb 2004, p. 1929, fig. 27.9:16
Lachish	239	5b-1	621576/60	Gottlieb 2004, p. 1929, fig. 27.9:18
Lachish	240	5a-1	61042/60	Gottlieb 2004, p. 1931, fig. 27.10:1
Lachish	241	5a-1	60712/60	Gottlieb 2004, p. 1931, fig. 27.10:2
Lachish	242	5b-1	61048/60	Gottlieb 2004, p. 1931, fig. 27.10:3
Lachish	243	5b-1	60671/60	Gottlieb 2004, p. 1931, fig. 27.10:4
Lachish	244	5b-1	61856/60	Gottlieb 2004, p. 1931, fig. 27.10:5
Lachish	245	5b-1	61342/60	Gottlieb 2004, p. 1931, fig. 27.10:6
Lachish	246	5b-1	62046/60	Gottlieb 2004, p. 1931, fig. 27.10:7
Lachish	247	5b-1	62262	Gottlieb 2004, p. 1931, fig. 27.10:8
Lachish	248	5b-1	61802/60	Gottlieb 2004, p. 1931, fig. 27.10:9
Lachish	249	5b-1?	62237	Gottlieb 2004, p. 1931, fig. 27.10:10
Lachish	250	5b-1	61257/60	Gottlieb 2004, p. 1931, fig. 27.10:11
Lachish	251	5b-1	61422/60	Gottlieb 2004, p. 1931, fig. 27.10:12
Lachish	252	5b-1	62204	Gottlieb 2004, p. 1931, fig. 27.10:13
Lachish	253	5b-1	61411/60	Gottlieb 2004, p. 1931, fig. 27.10:14
Lachish	254	5a-1	62197/60	Gottlieb 2004, p. 1931, fig. 27.10:15
Lachish	255	5a-1	60480/60	Gottlieb 2004, p. 1931, fig. 27.10:16
Lachish	256	5a-1	61255/60	Gottlieb 2004, p. 1931, fig. 27.10:17
Lachish	257	5a-1	60610/60	Gottlieb 2004, p. 1931, fig. 27.10:18
Lachish	258	5b-1	60820/60	Gottlieb 2004, p. 1933, fig. 27.11:1
Lachish	259	5b-1	60585/60	Gottlieb 2004, p. 1933, fig. 27.11:2
Lachish	260	5b-1	61424/60	Gottlieb 2004, p. 1933, fig. 27.11:3
Lachish	261	5b-1	60691/60	Gottlieb 2004, p. 1933, fig. 27.11:4
Lachish	262	5a-1	60551/60	Gottlieb 2004, p. 1933, fig. 27.11:5
Lachish	263	5b-1	62195/60	Gottlieb 2004, p. 1933, fig. 27.11:6
Lachish	264	5a-1	61272/60	Gottlieb 2004, p. 1933, fig. 27.11:7

Site	No.	Type	Item No.	Source
Lachish	265	5b-1	62189/60	Gottlieb 2004, p. 1933, fig. 27.11:8
Lachish	266	5b-1	60672/60	Gottlieb 2004, p. 1933, fig. 27.11:9
Lachish	267	5b-1	60515/60	Gottlieb 2004, p. 1933, fig. 27.11:10
Lachish	268	5b-1	60785/60	Gottlieb 2004, p. 1933, fig. 27.11:11
Lachish	269	5a-1	61558/60	Gottlieb 2004, p. 1933, fig. 27.11:12
Lachish	270	5a-1	60776/60	Gottlieb 2004, p. 1933, fig. 27.11:13
Lachish	271	5a-1	62202/60	Gottlieb 2004, p. 1933, fig. 27.11:14
Lachish	272	5a-1	60549/60	Gottlieb 2004, p. 1933, fig. 27.11:15
Lachish	273	5a-1	61799/60	Gottlieb 2004, p. 1933, fig. 27.11:16
Lachish	274	5a-1	61364/60	Gottlieb 2004, p. 1933, fig. 27.11:17
Lachish	275	5b-1	61959/60	Gottlieb 2004, p. 1935, fig. 27.12:1
Lachish	276	5b-1	61569/60	Gottlieb 2004, p. 1935, fig. 27.12:2
Lachish	277	5b-1	61907/60	Gottlieb 2004, p. 1935, fig. 27.12:3
Lachish	278	5b-1	62110/60	Gottlieb 2004, p. 1935, fig. 27.12:4
Lachish	279	5b-1	62028/60	Gottlieb 2004, p. 1935, fig. 27.12:5
Lachish	280	5b-1	62042/60	Gottlieb 2004, p. 1935, fig. 27.12:6
Lachish	281	5b-1	60605/60	Gottlieb 2004, p. 1935, fig. 27.12:7
Lachish	282	5b-1	61125/60	Gottlieb 2004, p. 1935, fig. 27.12:8
Lachish	283	5b-1	61806/60	Gottlieb 2004, p. 1935, fig. 27.12:9
Lachish	284	5b-1	61284/60	Gottlieb 2004, p. 1935, fig. 27.12:10
Lachish	285	5b-1	61275/60	Gottlieb 2004, p. 1935, fig. 27.12:11
Lachish	286	5b-1	61334/60	Gottlieb 2004, p. 1935, fig. 27.12:12
Lachish	287	5b-1	62055/60	Gottlieb 2004, p. 1935, fig. 27.12:13
Lachish	288	5b-1	61976/60	Gottlieb 2004, p. 1935, fig. 27.12:14
Lachish	289	5b-1	60807/60	Gottlieb 2004, p. 1935, fig. 27.12:15
Lachish	290	5b-1	60619/60	Gottlieb 2004, p. 1935, fig. 27.12:16
Lachish	291	5b-1	60604/60	Gottlieb 2004, p. 1935, fig. 27.12:17
Lachish	292	5b-1	62186/60	Gottlieb 2004, p. 1935, fig. 27.12:18
Lachish	293	5b-1	61657	Gottlieb 2004, p. 1935, fig. 27.12:19
Lachish	294	5b-1	61967/60	Gottlieb 2004, p. 1935, fig. 27.12:20
Lachish	295	5b-1	60410/60	Gottlieb 2004, p. 1937, fig. 27.13:1
Lachish	296	5b-1	61043/60	Gottlieb 2004, p. 1937, fig. 27.13:2
Lachish	297	5b-1	60823/60	Gottlieb 2004, p. 1937, fig. 27.13:3
Lachish	298	5b-1	61509/60	Gottlieb 2004, p. 1937, fig. 27.13:4
Lachish	299	5b-1	61981/60	Gottlieb 2004, p. 1937, fig. 27.13:5
Lachish	300	5b-1	61975/60	Gottlieb 2004, p. 1937, fig. 27.13:6
Lachish	301	5b-1	61278/60	Gottlieb 2004, p. 1937, fig. 27.13:7
Lachish	302	5b-1	61755/60	Gottlieb 2004, p. 1937, fig. 27.13:8
Lachish	303	5a-1	61930/60	Gottlieb 2004, p. 1937, fig. 27.13:9
Lachish	304	5b-1	60921/60	Gottlieb 2004, p. 1937, fig. 27.13:10
Lachish	305	5a-1	61235/60	Gottlieb 2004, p. 1937, fig. 27.13:11
Lachish	306	5a-1	61754	Gottlieb 2004, p. 1937, fig. 27.13:13
Lachish	307	5b-1	61652/60	Gottlieb 2004, p. 1937, fig. 27.13:14
Lachish	308	5a-1	62261	Gottlieb 2004, p. 1937, fig. 27.13:15
Lachish	309	5a-1	61517/60	Gottlieb 2004, p. 1937, fig. 27.13:16
Lachish	310	5a-1	61107/60	Gottlieb 2004, p. 1937, fig. 27.13:17
Lachish	311	5b-1	61413/60	Gottlieb 2004, p. 1937, fig. 27.13:18
Lachish	312	5b-1	61916/60	Gottlieb 2004, p. 1937, fig. 27.13:19
Lachish	313	5a-1	60689/60	Gottlieb 2004, p. 1937, fig. 27.13:20
Lachish	314	5b-1	61124/60	Gottlieb 2004, p. 1937, fig. 27.13:22
Lachish	315	5b-1	60620/60	Gottlieb 2004, p. 1937, fig. 27.13:23
Lachish	316	5b-1	61796/60	Gottlieb 2004, p. 1937, fig. 27.13:24
Lachish	317	5a-1	60367/60	Gottlieb 2004, p. 1939, fig. 27.14:1

Site	No.	Type	Item No.	Source
Lachish	318	5a-1	61093/60	Gottlieb 2004, p. 1939, fig. 27.14:2
Lachish	319	5b-1	61693	Gottlieb 2004, p. 1939, fig. 27.14:3
Lachish	320	5b-1	60674/60	Gottlieb 2004, p. 1939, fig. 27.14:4
Lachish	321	5a-1	61260/60	Gottlieb 2004, p. 1939, fig. 27.14:6
Lachish	322	5a-1	61459/60	Gottlieb 2004, p. 1939, fig. 27.14:7
Lachish	323	5a-1	61320/60	Gottlieb 2004, p. 1939, fig. 27.14:8
Lachish	324	5a-1	60801/60	Gottlieb 2004, p. 1939, fig. 27.14:9
Lachish	325	5a-1	61792/60	Gottlieb 2004, p. 1939, fig. 27.14:10
Lachish	326	5b-1	61566/60	Gottlieb 2004, p. 1939, fig. 27.14:11
Lachish	327	5b-1	62059/60	Gottlieb 2004, p. 1939, fig. 27.14:12
Lachish	328	5b-1	60677/60	Gottlieb 2004, p. 1939, fig. 27.14:13
Lachish	329	5a-1	60827/60	Gottlieb 2004, p. 1939, fig. 27.14:14
Lachish	330	5a-1	60764/60	Gottlieb 2004, p. 1939, fig. 27.14:15
Lachish	331	5b-1	60710/60	Gottlieb 2004, p. 1939, fig. 27.14:16
Lachish	332	5b-1	61598/60	Gottlieb 2004, p. 1939, fig. 27.14:17
Lachish	333	5b-1	60572/60	Gottlieb 2004, p. 1939, fig. 27.14:18
Lachish	334	5b-1	60846/60	Gottlieb 2004, p. 1939, fig. 27.14:20
Lachish	335	5a-1?	60803/60	Gottlieb 2004, p. 1941, fig. 27.15:1
Lachish	336	5b-1	61828/60	Gottlieb 2004, p. 1941, fig. 27.15:2
Lachish	337	5b-1	61311/60	Gottlieb 2004, p. 1941, fig. 27.15:3
Lachish	338	5a-1	61071/60	Gottlieb 2004, p. 1941, fig. 27.15:4
Lachish	339	5b-1	60721/60	Gottlieb 2004, p. 1941, fig. 27.15:5
Lachish	340	5a-1	60849/60	Gottlieb 2004, p. 1941, fig. 27.15:6
Lachish	341	5a-1	61307/60	Gottlieb 2004, p. 1941, fig. 27.15:7
Lachish	342	5b-1	60366/60	Gottlieb 2004, p. 1941, fig. 27.15:8
Lachish	343	5b-1	61020/60	Gottlieb 2004, p. 1941, fig. 27.15:9
Lachish	344	5a-1	62093/60	Gottlieb 2004, p. 1941, fig. 27.15:10
Lachish	345	5a-1	61621/60	Gottlieb 2004, p. 1941, fig. 27.15:12
Lachish	346	5a-1	60255/60	Gottlieb 2004, p. 1941, fig. 27.15:13
Lachish	347	5a-1	61994/60	Gottlieb 2004, p. 1941, fig. 27.15:14
Lachish	348	5b-1	60673/60	Gottlieb 2004, p. 1941, fig. 27.15:15
Lachish	349	5a-1	61601/60	Gottlieb 2004, p. 1941, fig. 27.15:16
Lachish	350	5a-1	62043/60	Gottlieb 2004, p. 1941, fig. 27.15:17
Lachish	351	5b-1	62248	Gottlieb 2004, p. 1941, fig. 27.15:19
Lachish	352	5b-1	60545/60	Gottlieb 2004, p. 1941, fig. 27.15:20
Lachish	353	5a-1	7139A	Gottlieb 2004, p. 1943, fig. 27.16:11
Lachish	354	5b-1	7139A	Gottlieb 2004, p. 1943, fig. 27.16:17
Lachish	355	5a-1?	5480	Gottlieb 2004, p. 1945, fig. 27.17:1
Lachish	356	5a-1	7060	Gottlieb 2004, p. 1945, fig. 27.17:3
Lachish	357	5a-1	7057(?)	Gottlieb 2004, p. 1945, fig. 27.17:5
Lachish	358	5b-1	6229	Gottlieb 2004, p. 1945, fig. 27.17:9
Lachish	359	5b-1	7056	Gottlieb 2004, p. 1945, fig. 27.17:13
Lachish	360	5a-1	5480	Gottlieb 2004, p. 1945, fig. 27.17:18
Lachish	361	5b-1		Gottlieb 2004, p. 1947, fig. 27.18:3
Lachish	362	5a-1?	7059	Gottlieb 2004, p. 1947, fig. 27.18:6
Lachish	363	5a-1	5481	Gottlieb 2004, p. 1947, fig. 27.18:12
Lachish	364	5b-1?	6290	Gottlieb 2004, p. 1947, fig. 27.18:13
Lachish	365	5q-1	7140	Gottlieb 2004, p. 1949, fig. 27.19:1
Lachish	366	5b-1	5481	Gottlieb 2004, p. 1949, fig. 27.19:3
Lachish	367	5a-1?	5481	Gottlieb 2004, p. 1949, fig. 27.19:6
Lachish	368	5a-1	5479	Gottlieb 2004, p. 1949, fig. 27.19:16
Lachish	369	5a-1	5481	Gottlieb 2004, p. 1949, fig. 27.19:17
Lachish	370	5a-1	5480	Gottlieb 2004, p. 1949, fig. 27.19:19

Site	No.	Type	Item No.	Source
Marlik	1	8	56 M	Negahban 1996, p. 275, pl. 126:824
Marlik	2	8	1522 M	Negahban 1995, p. 79, fig. 53
Marlik	3	7d	41a M	Negahban 1996, p. 277, pl. 126:826
Marlik	4	1c-6	41b M	Negahban 1996, p. 277, pl. 126:827
Marlik	5	5p-7	41c M	Negahban 1996, p. 277, pl. 126:828
Marlik	6	5p-8	328a M	Negahban 1995, p. 81, fig. 54
Marlik	7	5p-8	41d M	Negahban 1996, p. 277, pl. 126:830
Marlik	8	5a-9	1524 M	Negahban 1995, p. 81, fig. 55
Marlik	9	5q-5	177 M	Negahban 1995, p. 82, fig. 56
Marlik	10	5q-4	237a M	Negahban 1995, p. 82, fig. 57
Marlik	11	5q-4	112a M	Negahban 1995, p. 82, fig. 58
Marlik	12	5q-4	41e M	Negahban 1995, p. 82, fig. 59
Marlik	13	5q-22	636 M	Negahban 1996, p. 279, pl. 126:836
Marlik	14	5g-4	328b M	Negahban 1995, p. 82, fig. 60
Marlik	15	5g-4	1181a M	Negahban 1995, p. 82, fig. 61
Marlik	16	5g-4	112b M	Negahban 1995, p. 82, fig. 62
Marlik	17	5q-5	769a M	Negahban 1996, p. 279, pl. 126:840
Marlik	18	5q-5	41f M	Negahban 1996, p. 279, pl. 126:841
Marlik	19	5q-5	951a M	Negahban 1995, p. 82, pl. 12:155
Marlik	20	5q-5	1181b M	Negahban 1995, p. 82, pl. 12:156
Marlik	21	5g-4	328c M	Negahban 1995, p. 82, fig. 63
Marlik	22	5g-1	328d M	Negahban 1995, p. 83, fig. 64
Marlik	23	5q-4	326a M	Negahban 1995, p. 83, fig. 65
Marlik	24	5g-4	1181c M	Negahban 1995, p. 83, fig. 66
Marlik	25	3a-16	1523 M	Negahban 1996, p. 280, pl. 126:848
Marlik	26	3a-16	1523 M	Negahban 1996, p. 280, pl. 126:848
Marlik	27	3a-16	1523 M	Negahban 1996, p. 280, pl. 126:848
Marlik	28	5p-5	237b M	Negahban 1995, p. 86, fig. 67
Marlik	29	5f-5	328e M	Negahban 1995, p. 86, fig. 68
Marlik	30	5u-22	181 M	Negahban 1995, p. 86, fig. 69
Marlik	31	5q-5	326b M	Negahban 1995, p. 86, fig. 70
Marlik	32	5a-4	769b M	Negahban 1995, p. 86, fig. 71
Marlik	33	5f-1	41g M	Negahban 1995, p. 87, fig. 72
Marlik	34	5p-1	402 M	Negahban 1995, p. 87, fig. 73
Marlik	35	5f-1	1526 M	Negahban 1995, p. 87, fig. 74
Marlik	36	5p-1!	328f M	Negahban 1995, p. 87, fig. 75
Marlik	37	5f-1	1527 M	Negahban 1995, p. 87, fig. 76
Marlik	38	5p-1	41h M	Negahban 1995, p. 87, fig. 77
Marlik	39	5p-2	951b M	Negahban 1995, p. 87, fig. 78
Marlik	40	5a-3?	1521 M	Negahban 1995, p. 87, fig. 79
Marlik	41	5q-6	1525 M	Negahban 1995, p. 87, fig. 80
Marlik	42	9	179 M	Negahban 1996, p. 281, pl. 127:863
Marlik	43	9	179 M	Negahban 1996, p. 281, pl. 127:863
Marlik	44	9	179 M	Negahban 1996, p. 281, pl. 127:863
Marlik	45	9	179 M	Negahban 1996, p. 281, pl. 127:863
Marlik	46	9	179 M	Negahban 1996, p. 281, pl. 127:863
Marlik	47	9	179 M	Negahban 1996, p. 281, pl. 127:863
Marlik	48	9	179 M	Negahban 1996, p. 281, pl. 127:863
Nimrud	1	5b-1	ND 9268	British Museum
Nimrud	2	5b-1	ND 9268	British Museum
Nimrud	3	5b-1	ND 9268	British Museum
Nimrud	4	5b-1	ND 9268	British Museum
Nimrud	5	5b-1	ND 9268	British Museum

Site	No.	Type	Item No.	Source
Nimrud	6	5b-1?	ND 9268	British Museum
Nimrud	7	5b-1	ND 10944	British Museum
Nimrud	8	5b-1	ND 10944	British Museum
Nimrud	9	5b-1	ND 10944	British Museum
Nimrud	10	5b-1	ND 10944	British Museum
Nimrud	11	5b-1	ND 10944	British Museum
Nimrud	12	5b-1	ND 10944	British Museum
Nimrud	13	5b-1	ND 10944	British Museum
Nimrud	14	5b-1	ND 10944	British Museum
Nimrud	15	5b-1?	ND 10944	British Museum
Nimrud	16	5b-1?	ND 10944	British Museum
Nimrud	17	5b-1	ND 10944	British Museum
Nimrud	18	5b-1	ND 10944	British Museum
Nimrud	19	5b-1?	ND 10944	British Museum
Nimrud	20	5b-1?	ND 10944	British Museum
Nimrud	21	5b-1	ND 10944	British Museum
Nimrud	22	5b-1?	ND 10944	British Museum
Nimrud	23	5b-1?	ND 10944	British Museum
Nimrud	24	5b-1	ND 10944	British Museum
Nimrud	25	5b-1	ND 10944	British Museum
Nimrud	26	5b-1	ND 10944	British Museum
Nimrud	27	5b-1	ND 10944	British Museum
Nimrud	28	5b-1?	ND 10944	British Museum
Nimrud	29	5b-1	ND 10944	British Museum
Nimrud	30	5b-1	ND 10944	British Museum
Nimrud	31	5b-1	ND 10944	British Museum
Nimrud	32	5b-1	ND 10944	British Museum
Nimrud	33	5b-1	ND 10944	British Museum
Nimrud	34	5b-1	ND 10944	British Museum
Nimrud	35	5b-1	ND 10944	British Museum
Nimrud	36	5b-1	ND 10944	British Museum
Nimrud	37	5b-1	ND 10944	British Museum
Nimrud	38	5b-1	ND 10944	British Museum
Nimrud	39	5b-1	ND 10944	British Museum
Nimrud	40	5b-1	ND 10944	British Museum
Nimrud	41	5b-1	ND 10944	British Museum
Nimrud	42	5a-1	ND 10944	British Museum
Nimrud	43	5a-1	ND 10944	British Museum
Nimrud	44	5a-1	ND 10944	British Museum
Nimrud	45	5a-1	ND 10944	British Museum
Nimrud	46	5a-1	ND 10944	British Museum
Nimrud	47	5a-1	ND 10944	British Museum
Nimrud	48	5a-1	ND 10944	British Museum
Nimrud	49	5a-1	ND 10944	British Museum
Nimrud	50	5a-1	ND 10944	British Museum
Nimrud	51	5a-1	ND 10944	British Museum
Nimrud	52	5a-1	ND 10944	British Museum
Nimrud	53	5a-1	ND 10944	British Museum
Nimrud	54	5a-1	ND 10944	British Museum
Nimrud	55	5a-1	ND 10944	British Museum
Nimrud	56	5a-1	ND 10944	British Museum
Nimrud	57	5a-1	ND 10944	British Museum
Nimrud	58	5a-1	ND 10944	British Museum

Site	No.	Type	Item No.	Source
Nimrud	59	5a-1	ND 10944	British Museum
Nimrud	60	5a-1	ND 10944	British Museum
Nimrud	61	5a-1	ND 10944	British Museum
Nimrud	62	5a-1	ND 10944	British Museum
Nimrud	63	5a-1	ND 10944	British Museum
Nimrud	64	5a-1	ND 10944	British Museum
Nimrud	65	5a-1	ND 10944	British Museum
Nimrud	66	5a-1	ND 10944	British Museum
Nimrud	67	5a-1	ND 10944	British Museum
Nimrud	68	5a-1	ND 10944	British Museum
Nimrud	69	5a-1	ND 10944	British Museum
Nimrud	70	5a-1	ND 10944	British Museum
Nimrud	71	5a-1	ND 10944	British Museum
Nimrud	72	5a-1	ND 10944	British Museum
Nimrud	73	5a-1	ND 10944	British Museum
Nimrud	74	5a-1	ND 10944	British Museum
Nimrud	75	5a-1	ND 10944	British Museum
Nimrud	76	5a-1	ND 10944	British Museum
Nimrud	77	5a-1	ND 10944	British Museum
Nimrud	78	5a-1	ND 10944	British Museum
Nimrud	79	5a-1	ND 10944	British Museum
Nimrud	80	5a-1	ND 10944	British Museum
Nimrud	81	5a-1	ND 10944	British Museum
Nimrud	82	5a-1	ND 10944	British Museum
Nimrud	83	5a-1	ND 10944	British Museum
Nimrud	84	5a-1	ND 10944	British Museum
Nimrud	85	5a-1	ND 10944	British Museum
Nimrud	86	5a-1	ND 10944	British Museum
Nimrud	87	5a-1	ND 10944	British Museum
Nimrud	88	5a-1	ND 10944	British Museum
Nimrud	89	5a-1	ND 10944	British Museum
Nimrud	90	5a-1	ND 10944	British Museum
Nimrud	91	5a-1	ND 10944	British Museum
Nimrud	92	5a-1	ND 10944	British Museum
Nimrud	93	5a-1	ND 10944	British Museum
Nimrud	94	5a-1	ND 10944	British Museum
Nimrud	95	5a-1	ND 10944	British Museum
Nimrud	96	5a-1	ND 10944	British Museum
Nimrud	97	5a-1	ND 10944	British Museum
Nimrud	98	5a-1	ND 10944	British Museum
Nimrud	99	5a-1	ND 10944	British Museum
Nimrud	100	5a-1	ND 10944	British Museum
Nimrud	101	5a-1	ND 10944	British Museum
Nimrud	102	5a-1	ND 10944	British Museum
Nimrud	103	5a-1	ND 10944	British Museum
Nimrud	104	5a-1	ND 10944	British Museum
Nimrud	105	5a-1	ND 10944	British Museum
Nimrud	106	5a-1	ND 10944	British Museum
Nimrud	107	5a-1	ND 10944	British Museum
Nimrud	108	5a-1	ND 10944	British Museum
Nimrud	109	5a-1	ND 10944	British Museum
Nimrud	110	5a-1	ND 10944	British Museum
Nimrud	111	5a-1	ND 10944	British Museum

Site	No.	Type	Item No.	Source
Nimrud	112	5a-1	ND 10944	British Museum
Nimrud	113	5a-1	ND 10944	British Museum
Nimrud	114	5a-1	ND 10944	British Museum
Nimrud	115	5a-1	ND 10944	British Museum
Nimrud	116	5a-1	ND 10944	British Museum
Nimrud	117	5a-1	ND 10944	British Museum
Nimrud	118	5a-1	ND 10944	British Museum
Nimrud	119	5a-1	ND 10944	British Museum
Nimrud	120	5a-1	ND 10944	British Museum
Nimrud	121	5a-1	ND 10944	British Museum
Nimrud	122	5a-1	ND 10944	British Museum
Nimrud	123	5a-1	ND 10944	British Museum
Nimrud	124	5a-1	ND 10944	British Museum
Nimrud	125	5a-1	ND 10944	British Museum
Nimrud	126	5a-1	ND 10944	British Museum
Nimrud	127	5a-1	ND 10944	British Museum
Nimrud	128	5a-1	ND 10944	British Museum
Nimrud	129	5a-1	ND 10944	British Museum
Nimrud	130	5a-1	ND 10944	British Museum
Nimrud	131	5a-1	ND 10944	British Museum
Nimrud	132	5a-1	ND 10944	British Museum
Nimrud	133	5a-1	ND 10944	British Museum
Nimrud	134	5a-1	ND 10944	British Museum
Nimrud	135	5a-1	ND 10944	British Museum
Nimrud	136	5a-1	ND 10944	British Museum
Nimrud	137	5a-1	ND 10944	British Museum
Nimrud	138	5a-1	ND 10944	British Museum
Nimrud	139	5a-1	ND 10944	British Museum
Nimrud	140	5a-1	ND 10944	British Museum
Nimrud	141	5a-1	ND 10944	British Museum
Nimrud	142	5a-1	ND 10944	British Museum
Nimrud	143	5a-1	ND 10944	British Museum
Nimrud	144	5a-1	ND 10944	British Museum
Nimrud	145	5a-1	ND 10944	British Museum
Nimrud	146	5a-1	ND 10944	British Museum
Nimrud	147	5a-1	ND 10944	British Museum
Nimrud	148	5a-1	ND 10944	British Museum
Nimrud	149	5a-1	ND 10944	British Museum
Nimrud	150	5a-1	ND 10944	British Museum
Nimrud	151	5a-1	ND 10944	British Museum
Nimrud	152	5a-1	ND 10944	British Museum
Nimrud	153	5a-1	ND 10944	British Museum
Nimrud	154	5a-1	ND 10944	British Museum
Nimrud	155	5a-1	ND 10944	British Museum
Nimrud	156	5a-1	ND 10944	British Museum
Nimrud	157	5a-1	ND 10944	British Museum
Nimrud	158	5a-1	ND 10944	British Museum
Nimrud	159	5a-1	ND 10944	British Museum
Nimrud	160	5a-1	ND 10944	British Museum
Nimrud	161	5a-1	ND 10944	British Museum
Nimrud	162	5a-1	ND 10944	British Museum
Nimrud	163	5a-1	ND 10944	British Museum
Nimrud	164	5a-1	ND 10944	British Museum

Site	No.	Type	Item No.	Source
Nimrud	165	5a-1	ND 10944	British Museum
Nimrud	166	5a-1	ND 10944	British Museum
Nimrud	167	5a-1	ND 10944	British Museum
Nimrud	168	5a-1	ND 10944	British Museum
Nimrud	169	5a-1	ND 10944	British Museum
Nimrud	170	5a-1	ND 10944	British Museum
Nimrud	171	5a-1	ND 10944	British Museum
Nimrud	172	5a-1	ND 10944	British Museum
Nimrud	173	5a-1	ND 10944	British Museum
Nimrud	174	5a-1	ND 10944	British Museum
Nimrud	175	5a-1	ND 10944	British Museum
Nimrud	176	5a-1	ND 10944	British Museum
Nimrud	177	5a-1	ND 10944	British Museum
Nimrud	178	5a-1	ND 10944	British Museum
Nimrud	179	5a-1	ND 10944	British Museum
Nimrud	180	5a-1	ND 10944	British Museum
Nimrud	181	5a-1	ND 10944	British Museum
Nimrud	182	5a-1	ND 10944	British Museum
Nimrud	183	5a-1	ND 10944	British Museum
Nimrud	184	5a-1	ND 10944	British Museum
Nimrud	185	5a-1	ND 10944	British Museum
Nimrud	186	5a-1	ND 10944	British Museum
Nimrud	187	5a-1	ND 10944	British Museum
Nimrud	188	5a-1	ND 10944	British Museum
Nimrud	189	5a-1	ND 10944	British Museum
Nimrud	190	5a-1	ND 10944	British Museum
Nimrud	191	5a-1	ND 10944	British Museum
Nimrud	192	5a-1	ND 10944	British Museum
Nimrud	193	5a-1	ND 10944	British Museum
Nimrud	194	5a-1	ND 10944	British Museum
Nimrud	195	5a-1	ND 10944	British Museum
Nimrud	196	5a-1	ND 10944	British Museum
Nimrud	197	5a-1	ND 10944	British Museum
Nimrud	198	5a-1	ND 10944	British Museum
Nimrud	199	5a-1	ND 10944	British Museum
Nimrud	200	5a-1	ND 10944	British Museum
Nimrud	201	5a-1	ND 10944	British Museum
Nimrud	202	5a-1	ND 10944	British Museum
Nimrud	203	5a-1	ND 10944	British Museum
Nimrud	204	5a-1	ND 10944	British Museum
Nimrud	205	5a-1	ND 10944	British Museum
Nimrud	206	5a-1	ND 10944	British Museum
Nimrud	207	5a-1	ND 10944	British Museum
Nimrud	208	5a-1	ND 10944	British Museum
Nimrud	209	5a-1	ND 10944	British Museum
Nimrud	210	5a-1	ND 10944	British Museum
Nimrud	211	5a-1	ND 10944	British Museum
Nimrud	212	5a-1	ND 10944	British Museum
Nimrud	213	5a-1	ND 10944	British Museum
Nimrud	214	5a-1	ND 10944	British Museum
Nimrud	215	5a-1	ND 10944	British Museum
Nimrud	216	5a-1	ND 10944	British Museum
Nimrud	217	5a-1	ND 10944	British Museum

Site	No.	Type	Item No.	Source
Nimrud	218	5a-1	ND 10944	British Museum
Nimrud	219	5a-1	ND 10944	British Museum
Nimrud	220	5a-1	ND 10944	British Museum
Nimrud	221	5a-1	ND 10944	British Museum
Nimrud	222	5a-1	ND 10944	British Museum
Nimrud	223	5a-1	ND 10944	British Museum
Nimrud	224	5a-1	ND 10944	British Museum
Nimrud	225	5a-1	ND 10944	British Museum
Nimrud	226	5a-1	ND 10944	British Museum
Nimrud	227	5a-1	ND 10944	British Museum
Nimrud	228	5a-1	ND 10944	British Museum
Nimrud	229	5a-1	ND 10944	British Museum
Nimrud	230	5a-1	ND 10944	British Museum
Nimrud	231	5b-1	ND 9268	British Museum
Nimrud	232	5b-1	ND 9268	British Museum
Nimrud	233	5q-1	ND 10944	British Museum
Nimrud	234	5q-1	ND 10944	British Museum
Nimrud	235	5b-1	ND 10944	British Museum
Nimrud	236	5b-1	ND 9268	British Museum
Nimrud	237	5b-1	ND 10944	British Museum
Nimrud	238	5b-1	ND 10944	British Museum
Nimrud	239	5b-1?	ND 10944	British Museum
Nimrud	240	5?	ND 10944	British Museum
Nimrud	241	5a-1	ND 10944	British Museum
Nimrud	242	5a-1?	ND 10944	British Museum
Nimrud	243	5?	ND 2525	British Museum
Nimrud	244	5?	ND 2525	British Museum
Nimrud	245	5a-1	ND 7534	British Museum
Nimrud	246	5a-1	ND 7534	British Museum
Nimrud	247	5a-1	ND 7534	British Museum
Nimrud	248	5a-1	ND 7534	British Museum
Nimrud	249	5a-1	ND 7534	British Museum
Nimrud	250	5z-14	ND 6120	British Museum
Nimrud	251	5b-1	ND 8102	British Museum
Nimrud	252	5b-1	ND 3355	British Museum
Nimrud	253	5a-1	ND 10998	British Museum
Nimrud	254	5a-1	ND 7542	British Museum
Nimrud	255	5a-1	ND 9215	British Museum
Nimrud	256	5a-1	ND 5220	British Museum
Nimrud	257	5a-1	ND 9265	British Museum
Nimrud	258	5a-1	ND 3292	British Museum
Nimrud	259	5a-1	ND 3632	British Museum
Nimrud	260	5a-1?	ND 5219	British Museum
Nimrud	261	5a-1	ND 7505	British Museum
Nimrud	262	5a-1	ND 6182	British Museum
Nimrud	263	1a-8	ND 3362	British Museum
Nimrud	264	2-3	ND 4261	British Museum
Nimrud	265	3a-1	ND 5307	British Museum
Nimrud	266	3a-8	ND 3298	British Museum
Nimrud	267	3a-2?	ND 4188	British Museum
Nimrud	268	3a-2	ND 4149	British Museum
Nineveh	1	2-1	NIN 89/1	Pickworth 2005, pp. 295-316
Nineveh	2	2-1	NIN 89/23	Pickworth 2005, pp. 295-316

Site	No.	Type	Item No.	Source
Nineveh	3	2-1	NIN 89/24	Pickworth 2005, pp. 295-316
Nineveh	4	2-3	NIN 89/44	Pickworth 2005, pp. 295-316
Nineveh	5	2-1	NIN 87/5	Pickworth (personal communication)
Nineveh	6	3b-3	NIN 90/35	Pickworth 2005, pp. 295-316
Nineveh	7	3b-2?	NIN 89/17	Pickworth 2005, pp. 295-316
Nineveh	8	3b-2?	NIN 89/2	Pickworth 2005, pp. 295-316
Nineveh	9	3a-3	NIN 89/46	Pickworth 2005, pp. 295-316
Nineveh	10	3a-3	NIN 89/37	Pickworth (personal communication)
Nineveh	11	3a-2?	NIN 90/33	Pickworth 2005, pp. 295-316
Nineveh	12	3a-2?	NIN 90/34	Pickworth 2005, pp. 295-316
Nineveh	13	3a-2?	NIN 89/196	Pickworth 2005, pp. 295-316
Nineveh	14	3a-2?	NIN 90/32	Pickworth 2005, pp. 295-316
Nineveh	15	3a-2?	NIN 90/31	Pickworth 2005, pp. 295-316
Nineveh	16	3a-2?	NIN 89/45	Pickworth 2005, pp. 295-316
Nineveh	17	3a-2?	NIN 89/43	Pickworth 2005, pp. 295-316
Nineveh	18	3a-2?	NIN 89/30	Pickworth 2005, pp. 295-316
Nineveh	19	3a-2?	NIN 89/21	Pickworth 2005, pp. 295-316
Nineveh	20	3a-2?	NIN 90/36	Pickworth 2005, pp. 295-316
Nineveh	21	3a-2?	NIN 89/31	Pickworth 2005, pp. 295-316
Nineveh	22	5b-1	NIN 89/19	Pickworth 2005, pp. 295-316
Nippur	1	5a-1	2N 214	McCown 1967, p. 116, pl. 154:15
Nippur	2	5p-1	2N 531	McCown 1967, p. 137, pl. 154:16
Nippur	3	3a-1?	1N 187	McCown 1967, p. 117, pl. 154:17
Nippur	4	6	2N 124	McCown 1967, pl. 154:19
Nippur	5	5b-1	4N 150	McCown 1978, p. 66, pl. 60:8
Nush-i Jan	1	5a-1	NU 77/52	Curtis 1984, p. 26, fig 6:248
Nush-i Jan	2	5b-4?	NU 77/54	Curtis 1984, p. 26, fig 6:249
Nush-i Jan	3	5a-2?	NU 73/55	Curtis 1984, p. 26, fig 6:250
Nush-i Jan	4	5b-1?	NU 70/402	Curtis 1984, p. 26, fig 6:251
Nush-i Jan	5	5?	NU 74/52	Curtis 1984, p. 26, fig 6:252
Nush-i Jan	6	1a-3	NU 67/176	Curtis 1984, p. 26, fig 6:253
Nush-i Jan	7	5a-21	NU 77/27	Curtis 1984, p. 26, fig 6:254
Nush-i Jan	8	5p-20	NU 73/36	Curtis 1984, p. 27, fig 6:255
Nush-i Jan	9	5a-21	NU 67/29	Curtis 1984, p. 27, fig 6:256
Nush-i Jan	10	5a-1?	NU 74/35	Curtis 1984, p. 27, fig 6:257
Nush-i Jan	11	5a-1!	NU 73/37	Curtis 1984, p. 27, fig 6:258
Nush-i Jan	12	3a-2	NU 67/167	Curtis 1984, p. 27, fig 6:259
Nush-i Jan	13	3a-11	NU 70/351	Curtis 1984, p. 27, fig 6:250
Nush-i Jan	14	3a-5?	NU 74/26	Curtis 1984, p. 27, fig 6:251
Nush-i Jan	15	3a-2?	NU 70/183	Curtis 1984, p. 27, fig 6:252
Sialk	1	1a-2	S 547b, a	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	2	1a-2	S 547b, b	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	3	1a-2	S 547b, c	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	4	1a-7	S 547b, d	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	5	1a-7	S 547b, e	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	6	1a-7	S 547b, f	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	7	1a-7?	S 547b, g	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	8	5a-1	S 547c, a	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	9	5p-1	S 547c, b	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	10	5a-1	S 547c, c	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	11	5a-1	S 547c, d	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	12	5a-1	S 547c, e	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	13	5a-1	S 547c, f	Ghirshman 1939, vol. 2, p. 229; pl. 50

Site	No.	Type	Item No.	Source
Sialk	14	5a-1	S 547c, g	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	15	5a-1	S 547c, h	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	16	5a-3	S 546f	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	17	5p-19?	S 793a, a	Ghirshman 1939, vol. 2, p, 233, pl. 57
Sialk	18	5a-2	S 793a, b	Ghirshman 1939, vol. 2, p, 233, pl. 57
Sialk	19	5p-20?	S 793a, c	Ghirshman 1939, vol. 2, p, 233, pl. 57
Sialk	20	5p-19?	S 793a, d	Ghirshman 1939, vol. 2, p, 233, pl. 57
Sialk	21	5p-20?	S 793a, e	Ghirshman 1939, vol. 2, p, 233, pl. 57
Sialk	22	5a-2	S 793a, f	Ghirshman 1939, vol. 2, p, 233, pl. 57
Sialk	23	5a-1	S 793b, a	Ghirshman 1939, vol. 2, p, 233, pl. 57
Sialk	24	5a-1	S 793b, b	Ghirshman 1939, vol. 2, p, 233, pl. 57
Sialk	25	1a-2	S 793b, c	Ghirshman 1939, vol. 2, p, 233, pl. 57
Sialk	26	1a-2	S 793b, d	Ghirshman 1939, vol. 2, p, 233, pl. 57
Sialk	27	1a-2	S 793b, e	Ghirshman 1939, vol. 2, p, 233, pl. 57
Sialk	28	5a-1	S 642a	Ghirshman 1939, vol. 2, p. 234, pl. 59
Sialk	29	5a-1	S 642b	Ghirshman 1939, vol. 2, p. 234, pl. 59
Sialk	30	5a-1	S 764, a	Ghirshman 1939, vol. 2, p. 235, pl. 62
Sialk	31	5a-1	S 764, b	Ghirshman 1939, vol. 2, p. 235, pl. 62
Sialk	32	5p-20?	S 764, c	Ghirshman 1939, vol. 2, p. 235, pl. 62
Sialk	33	5p-20?	S 764, d	Ghirshman 1939, vol. 2, p. 235, pl. 62
Sialk	34	5a-2	S 764, e	Ghirshman 1939, vol. 2, p. 235, pl. 62
Sialk	35	5a-4?	S 766b	Ghirshman 1939, vol. 2, p. 236, pl. 62
Sialk	36	5a-4	S 723e	Ghirshman 1939, vol. 2, p. 239, pl. 68
Sialk	37	5a-1	S 892e, a	Ghirshman 1939, vol. 2, p. 242, pl. 71
Sialk	38	5f-1?	S 892e, b	Ghirshman 1939, vol. 2, p. 242, pl. 71
Sialk	39	5a-1	S 892e, c	Ghirshman 1939, vol. 2, p. 242, pl. 71
Sialk	40	5a-1	S 892e, d	Ghirshman 1939, vol. 2, p. 242, pl. 71
Sialk	41	5p-20	S 919a	Ghirshman 1939, vol. 2, p. 243, pl. 75
Sialk	42	5p-23	S 923a	Ghirshman 1939, vol. 2, p. 244, pl. 75
Sialk	43	5p-22	S 923b	Ghirshman 1939, vol. 2, p. 244, pl. 75
Sialk	44	5a-1	S 923c, a	Ghirshman 1939, vol. 2, p. 244, pl. 75
Sialk	45	5p-1	S 923c, b	Ghirshman 1939, vol. 2, p. 244, pl. 75
Sialk	46	5b-1	S 923d, a	Ghirshman 1939, vol. 2, p. 244, pl. 75
Sialk	47	5b-1	S 923d, b	Ghirshman 1939, vol. 2, p. 244, pl. 75
Sialk	48	5a-3	S 923e, a	Ghirshman 1939, vol. 2, p. 244, pl. 75
Sialk	49	5p-20?	S 923e, b	Ghirshman 1939, vol. 2, p. 244, pl. 75
Sialk	50	5p-1	S 923e, c	Ghirshman 1939, vol. 2, p. 244, pl. 75
Sialk	51	1a-4	S 973a, a	Ghirshman 1939, vol. 2, p. 244, pl. 77
Sialk	52	1a-4	S 973a, b	Ghirshman 1939, vol. 2, p. 244, pl. 77
Sialk	53	5a-2	S 973a, c	Ghirshman 1939, vol. 2, p. 244, pl. 77
Sialk	54	5a-1	S 973a, d	Ghirshman 1939, vol. 2, p. 244, pl. 77
Sialk	55	5a-3	S 973a, e	Ghirshman 1939, vol. 2, p. 244, pl. 77
Sialk	56	5a-2	S 973a, f	Ghirshman 1939, vol. 2, p. 244, pl. 77
Sialk	57	5a-1	pl. 92:1	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	58	5u-1	pl. 92:2	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	59	5u-1	pl. 92:3	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	60	5a-1	pl. 92:4	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	61	5a-1	pl. 92:5	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	62	5a-1	pl. 92:6	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	63	1c-2	pl. 92:7	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	64	1c-2	pl. 92:8	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	65	1c-2	pl. 92:9	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	66	1a-2	pl. 92:10	Ghirshman 1939, vol. 2, p. 248, pl. 92

Site	No.	Type	Item No.	Source
Sialk	67	1a-4	pl. 92:11	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	68	1a-4	pl. 92:12	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	69	5u-21	pl. 92:13	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	70	5u-21	pl. 92:14	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	71	5r-20	pl. 92:15	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	72	5u-21!	pl. 92:16	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	73	3b-2	pl. 92:17	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	74	3a-5	pl. 92:18	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	75	5p-1	pl. 92:19	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	76	5r-1	pl. 92:20	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	77	5r-4	pl. 92:21	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	78	5p-1	pl. 92:22	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	79	5a-49	pl. 92:23	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sultantepe	1	5q-5	Fig. 6:2	Lloyd 1954, p. 107, 109; Fig. 6
Sultantepe	2	5a-1	Fig. 6:3	Lloyd 1954, p. 107, 109; Fig. 6
Sultantepe	3	3a-19	Fig. 6:4	Lloyd 1954, p. 107, 109; Fig. 6
Sultantepe	4	3a-2	Fig. 6:5	Lloyd 1954, p. 107, 109; Fig. 6
Sultantepe	5	3a-19	Fig. 6:6	Lloyd 1954, p. 107, 109; Fig. 6
Tell Knedig	1	5b-1	1117	Klengel-Brandt et al 2005, p. 305; pl. 201
Tell Knedig	2	5b-1	1118	Klengel-Brandt et al 2005, p. 306, pl. 201
Tell Knedig	3	5b-1	1119a	Klengel-Brandt et al 2005, p. 306, pl. 201
Tell Knedig	4	5b-1	1119b	Klengel-Brandt et al 2005, p. 306, pl. 201
Tell Knedig	5	5b-1	1119c	Klengel-Brandt et al 2005, p. 306, pl. 201
Tell Knedig	6	5b-1	1119d	Klengel-Brandt et al 2005, p. 306, pl. 201
Tell Knedig	7	5b-1	1119e	Klengel-Brandt et al 2005, p. 306, pl. 201
Tell Knedig	8	5b-1	1119f	Klengel-Brandt et al 2005, p. 306, pl. 201
Tell Knedig	9	5b-1	1119g	Klengel-Brandt et al 2005, p. 306, pl. 201
Tell Knedig	10	5b-37	1120	Klengel-Brandt et al 2005, p. 306, pl. 201
Tell Knedig	11	5b-37	1121	Klengel-Brandt et al 2005, p. 306, pl. 201
Tell Knedig	12	5b-37	1122	Klengel-Brandt et al 2005, p. 306, pl. 201
Tell Knedig	13	5?	1123	Klengel-Brandt et al 2005, p. 306, pl. 202
Tell Knedig	14	5b-1	1124	Klengel-Brandt et al 2005, p. 306, pl. 202
Tell Knedig	15	1a-1?	1162	Klengel-Brandt et al 2005, p. 309, pl. 201
Toprakkale	1	3a-3	33	Wartke 1990, p. 61, fig. 9a; pl. 14:a.1
Toprakkale	2	3a-3	34	Wartke 1990, p. 61, fig. 9a; pl. 14:a.2
Toprakkale	3	2-3	35	Wartke 1990, p. 61, fig. 9b; pl. 14:a.3
Toprakkale	4	2-3	36	Wartke 1990, p. 61, fig. 9b; pl. 14:a.4
Toprakkale	5	5g-1	264	Wartke 1990, p. 127, fig. 32a; pl. 39:b.1
Toprakkale	6	5g-1	290	Wartke 1990, p. 127, fig. 32b
Toprakkale	7	5b-1	303	Wartke 1990, p. 127, fig. 32c
Toprakkale	8	5b-1	314	Wartke 1990, pl. 39:b.2
Toprakkale	9	5b-1	319	Wartke 1990, p. 127, fig. 32d
Toprakkale	10	5g-1	320	Wartke 1990, p. 127, fig. 32e
Toprakkale	11	5b-1	326	Wartke 1990, p. 127, fig. 32f; pl. 39:b.3
Toprakkale	12	5f-1	332	Wartke 1990, p. 127, fig. 32g
Toprakkale	13	5a-1	333	Wartke 1990, pl. 39:b.4
Toprakkale	14	5f-1!	334	Wartke 1990, p. 127, fig. 32h; pl. 39:b.5
Toprakkale	15	2-2!	335	Wartke 1990, p. 127, fig. 32i
Toprakkale	16	1a-8?	336	Wartke 1990, p. 127, fig. 32k
Toprakkale	17	5e-57	337	Wartke 1990, p. 127, fig. 32l; pl. 39:b.6
Toprakkale	18	1c-5	338	Wartke 1990, p. 127, fig. 32m; pl. 39:b.7
Toprakkale	19	1c-2	343	Wartke 1990, pl. 39:b.8
Toprakkale	20	1c-2	344	Wartke 1990, p. 127, fig. 32n

Site	No.	Type	Item No.	Source
Toprakkale	21	1a-3	350	Wartke 1990, p. 127, fig. 32o; pl. 39:b.9
Toprakkale	22	3a-16!	351	Wartke 1990, p. 127, fig. 32p; pl. 39:b.10
Uruk	1	5b-1	W 20128,1. 2	van Ess & Pedde 1992, p. 67, no. 748
Uruk	2	5b-1	W 20128,1. 2	van Ess & Pedde 1992, p. 67, no. 748
Uruk	3	5a-1	W 21032,1	van Ess & Pedde 1992, p. 67, no. 749
Uruk	4	5b-1!	W 21894,3	van Ess & Pedde 1992, p. 68, no. 750
Uruk	5	5b-1	W 21894,3	van Ess & Pedde 1992, p. 68, no. 750
Uruk	6	5b-1!	W 21898, 1	van Ess & Pedde 1992, p. 68, no. 751
Uruk	7	5b-1	W 21898, 2	van Ess & Pedde 1992, p. 68, no. 751
Uruk	8	5b-1?	W 21898, 3	van Ess & Pedde 1992, p. 68, no. 751
Uruk	9	5b-1?	W 21898, 4	van Ess & Pedde 1992, p. 68, no. 751
Uruk	10	5b-1?	W 21898, 5	van Ess & Pedde 1992, p. 68, no. 751
Uruk	11	5a-1?	W 21971,1	van Ess & Pedde 1992, p. 68, no. 752
Uruk	12	1c-1	W 19465	van Ess & Pedde 1992, p. 37, no. 352
Uruk	13	5b-1	W 21710	van Ess & Pedde 1992, p. 37, no. 353
Uruk	14	5q-2!	W 18184	van Ess & Pedde 1992, p. 37, no. 354
Uruk	15	2-5	W 14124	van Ess & Pedde 1992, p. 37, no. 355
Uruk	16	2-1	W 19241	van Ess & Pedde 1992, p. 37, no. 356
Uruk	17	2-1	W 19247	van Ess & Pedde 1992, p. 37, no. 357
Uruk	18	3a-1	W 17739	van Ess & Pedde 1992, p. 38, no. 358
Uruk	19	3a-4	W 21176	van Ess & Pedde 1992, p. 38, no. 359
Uruk	20	3a-7	W 24377	van Ess & Pedde 1992, p. 38, no. 360
Uruk	21	3a-2	W 24575	van Ess & Pedde 1992, p. 38, no. 361
Uruk	22	5p-2	W 4232	Pedde et al 2000, p. 42, no. 665
Uruk	23	1c-1?	W 2212	Pedde et al 2000, p. 42, no. 666
Uruk	24	5a-1	W 14744	Pedde et al 2000, p. 42, no. 667
Uruk	25	5p-1	W 14855	Pedde et al 2000, p. 42, no. 668
Uruk	26	3a-5	W 7332	Pedde et al 2000, p. 42, no. 669
Uruk	27	3a-2	W 8756	Pedde et al 2000, p. 43, no. 670
Uruk	28	3a-2	W 15771	Pedde et al 2000, p. 43, no. 671
Uruk	29	5b-1	W 1623	Pedde et al 2000, p. 73, no. 1259

Appendix D: Site Chronology

For the purposes of the site and type chronology charts, the Neo-Assyrian Period will be classified as 925-600 BC, beginning roughly with the reign of Aššur-dān II or Adad-nirari II and ending with the collapse of the empire at the end of the 7th Century BC (see §2.2.1).

The Urartian Period will be classified as 850-600. Urartu coalesced as a state in the mid 9th Century BC,[1] however the date of its collapse is a matter of considerable debate.[2] An Urartian king is attested during the reign of Assurbanipal,[3] and the Babylonian Chronicle mentions Urartu in 594 BC, though this may have referred only to the region rather than to a specific state.[4] I have therefore rounded the end date to a very generalized 600 BC.

The Neo-Babylonian Period will be classified as 625-525 BC (which will only span 625-600 on this chart), ss it is generaly regarded as being founded by Nabopolassar in 626 BC and ended with the defeat of Nabonidus in 539 BC.[5]

Note that the dates assigned to the types are based on the dates provided in the arrowhead publications. Thus Type 2-2 is dated from 850-600 BC because those from Bastam are merely assigned to the Urartian Period, though they most likely come from the last century of that period. Therefore, arrowhead types cannot be assumed to be attested for the entirety of the periods indicated here, but merely at some point within them.

Key:

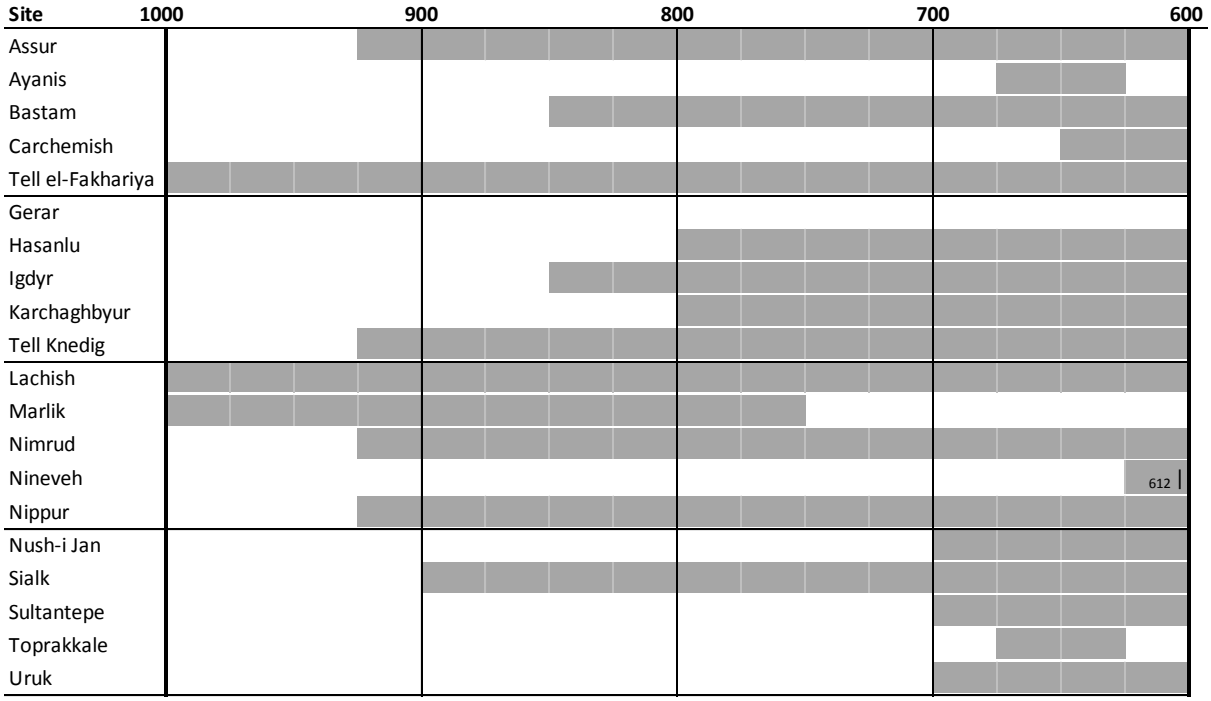
 - not attested within this time span

 - attested within this time span

 - sites where dating is unknown

[1] Zimansky 1995b, p. 1138; Zimansky 1997, p. 292
[2] see Hellwag 2012, pp. 238-241
[3] Zimansky 1995b, pp. 1141
[4] Zimansky 1995b, pp. 1140-1141
[5] Kuhrt 1995, p. 589

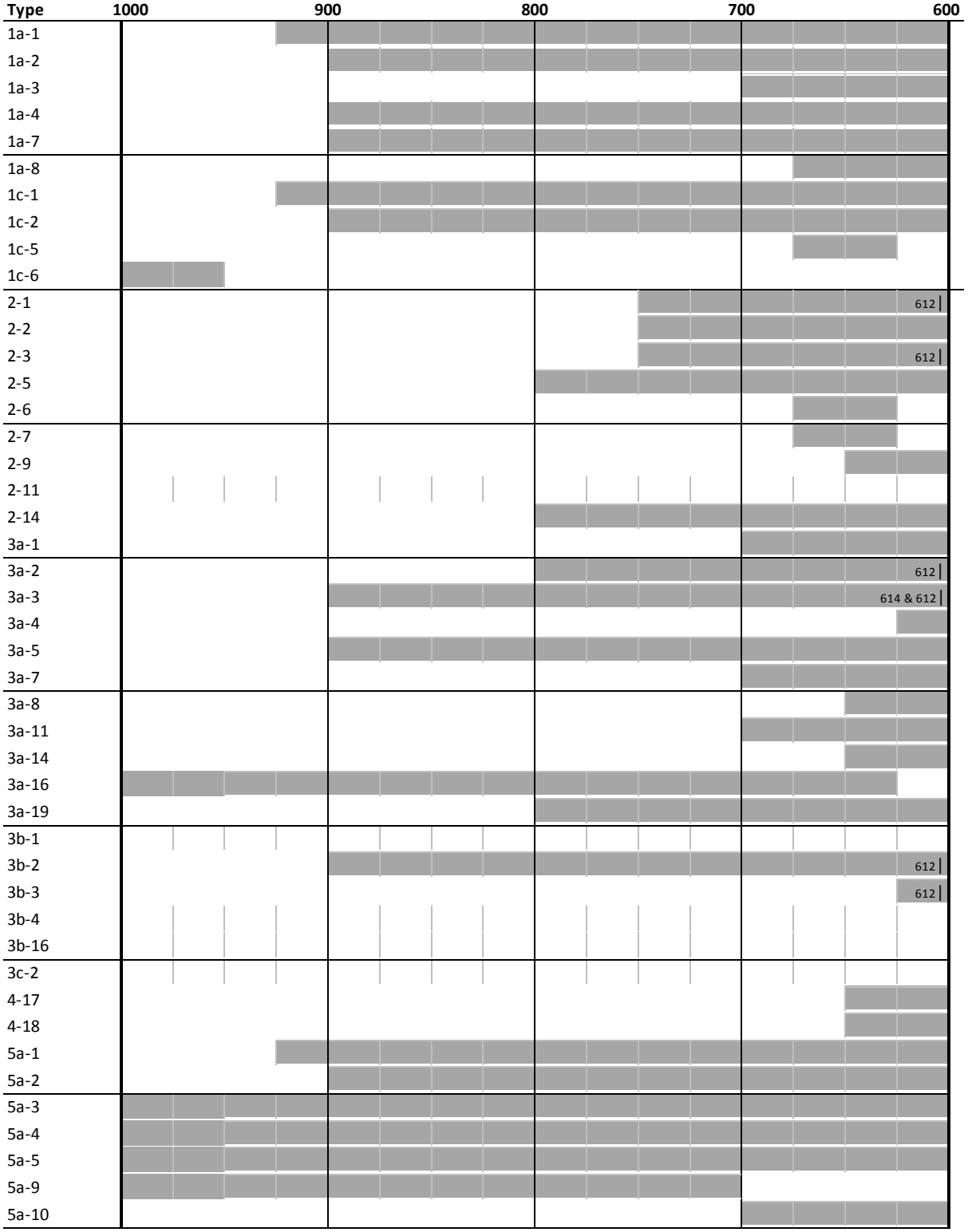
Date span in which arrowheads are attested, by site (years BC, rounded to nearest quarter century).



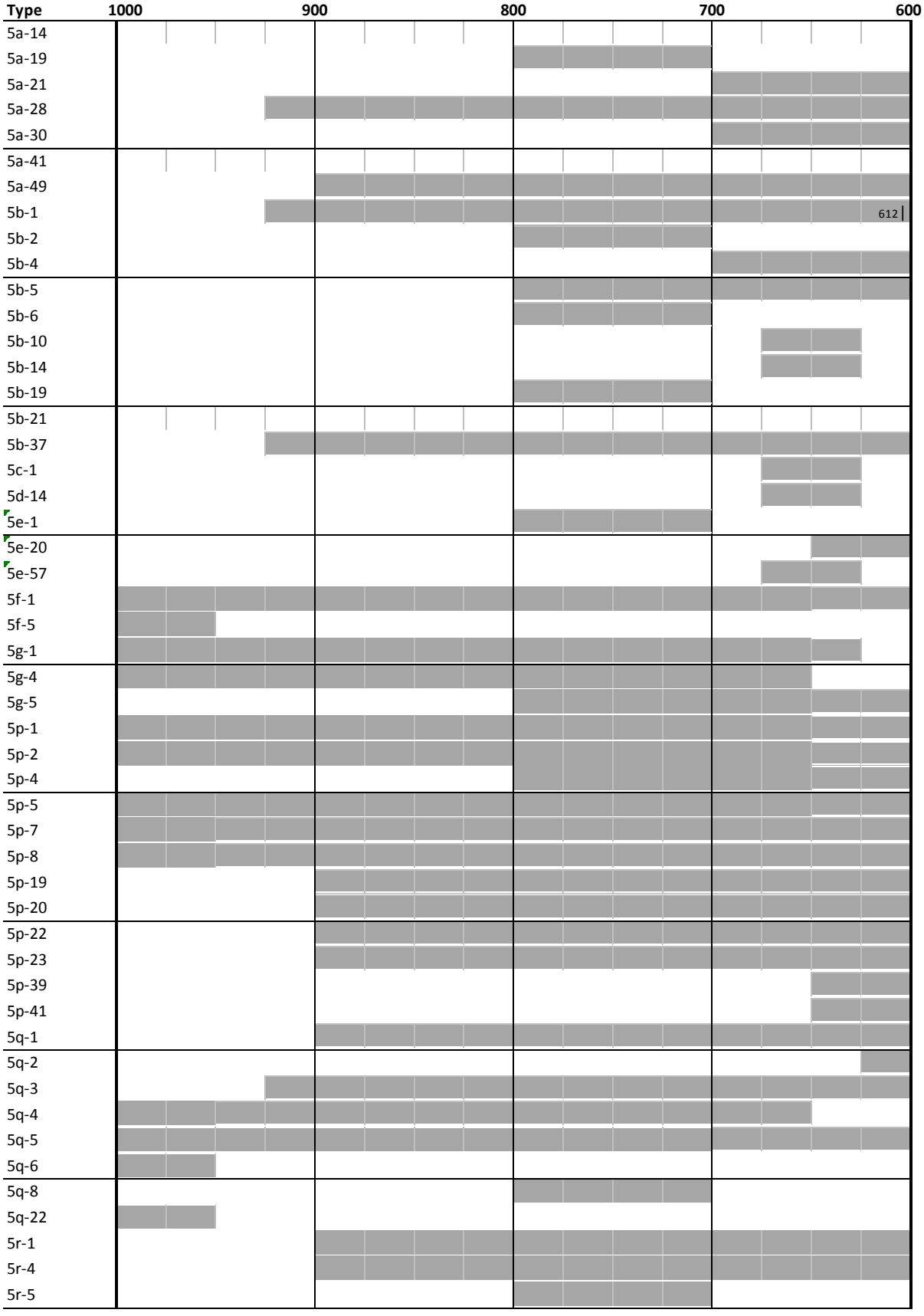
Appendix E: Type Chronology

For dating conventions, see Appendix D.

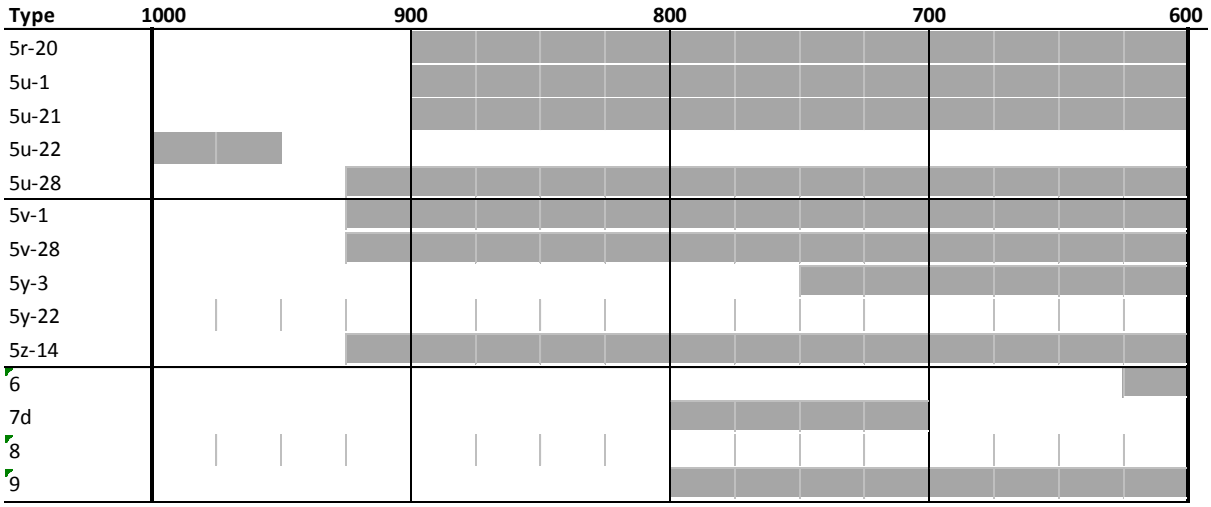
Date span in which arrowheads are attested, by type (years BC, rounded to nearest quarter century).



Date span in which arrowheads are attested, by type (years BC, rounded to nearest quarter century).



Date span in which arrowheads are attested, by type (years BC, rounded to nearest quarter century).



Appendix F: Aiming Styles

Chart summarizing aiming styles (direct, horizontal, and high) in Assyrian reliefs and Balawat Gates (BG). See §3.9.

Motif	Date	Context
direct aim	Assurnasirpal II	enemies (melee)
direct aim	Assurnasirpal II	enemies (siege)
direct aim	Assurnasirpal II	infantry (siege)
high aim	Assurnasirpal II	enemies (melee)
high aim	Assurnasirpal II	hunting
horizontal aim	Assurnasirpal II	cavalry
horizontal aim	Assurnasirpal II	charioteers
horizontal aim	Assurnasirpal II	enemies (siege)
low aim	Assurnasirpal II	infantry (siege)
direct aim	Assurnasirpal II (BG)	enemies (siege)
direct aim	Assurnasirpal II (BG)	hunting
direct aim	Assurnasirpal II (BG)	infantry (melee)
direct aim	Assurnasirpal II (BG)	infantry (siege)
high aim	Assurnasirpal II (BG)	cavalry
high aim	Assurnasirpal II (BG)	charioteers
high aim	Assurnasirpal II (BG)	charioteers
high aim	Assurnasirpal II (BG)	infantry (siege)
horizontal aim	Assurnasirpal II (BG)	cavalry
horizontal aim	Assurnasirpal II (BG)	charioteers
horizontal aim	Assurnasirpal II (BG)	infantry (melee)
horizontal aim	Assurnasirpal II (BG)	infantry (siege)
direct aim	Shalmaneser III (BG)	enemies (siege)
direct aim	Shalmaneser III (BG)	infantry (siege)
high aim	Shalmaneser III (BG)	cavalry
high aim	Shalmaneser III (BG)	charioteers
high aim	Shalmaneser III (BG)	enemies (siege)
high aim	Shalmaneser III (BG)	infantry (siege)
horizontal aim	Shalmaneser III (BG)	cavalry
horizontal aim	Shalmaneser III (BG)	charioteers
horizontal aim	Shalmaneser III (BG)	infantry (melee)
horizontal aim	Shalmaneser III (BG)	infantry (siege)
direct aim	Tiglath-Pileser III	enemies (siege)
direct aim	Tiglath-Pileser III	infantry (siege)
high aim	Tiglath-Pileser III	infantry (melee)
horizontal aim	Tiglath-Pileser III	charioteers
horizontal aim	Tiglath-Pileser III	infantry (siege)
direct aim	Sargon II	enemies (siege)
direct aim	Sargon II	infantry (siege)

Motif	**Date**	**Context**
high aim	Sargon II	charioteers
high aim	Sargon II	infantry (siege)
horizontal aim	Sargon II	charioteers
horizontal aim	Sargon II	enemies (siege)
direct aim	Sennacherib	cavalry
direct aim	Sennacherib	enemies (melee)
direct aim	Sennacherib	enemies (siege)
direct aim	Sennacherib	infantry (melee)
direct aim	Sennacherib	infantry (siege)
high aim	Sennacherib	enemies (melee)
high aim	Sennacherib	infantry (siege)
horizontal aim	Sennacherib	charioteers
direct aim	Assurbanipal	enemies (siege)
direct aim	Assurbanipal	hunting
direct aim	Assurbanipal	infantry (siege)
high aim	Assurbanipal	hunting
horizontal aim	Assurbanipal	infantry (siege)

Appendix G: Iconographic and Textual Sources

Designations of iconographic and textual sources, along with context in which they were found (when known). See §3 & 4.

Abbreviations:

- AB Building – *AB Building, Nimrud*
- Balawat AnpII = *Palace of Assurnasirpal II, Balawat*
- Balawat Mamu = *Temple of Mamu, Balawat*
- Balawat ShalIII = *Palace of Shalmaneser III, Balawat*
- Burnt Palace = *Burnt Palace, Nimrud*
- Central Palace = *Central Palace, Nimrud*
- FortShal = *Fort Shalmaneser, Nimrud*
- Grave PG.21 = *Grave PG.21, Nimrud*
- Ištar Temple = *Temple of Ištar, Nineveh*
- Khorsabad = *Khorsabad Palace*
- Ninurta Temple = *Temple of Ninurta, Nimrud*
- North Palace = *North Palace, Nineveh*
- NW Palace = *Northwest Palace, Nimrud*
- SW Palace = *Southwest Palace, Nineveh*
- TNII Palace – *Palace of Tukulti-Ninurta II, Assur*
- Ziggurat Terrace = *Ziggurat Terrace, Nimrud*
- lit. text = *literary text*
- wall pnt. = *wall painting*

Designation	Reference	Type	Context	Date
A 641	Delaporte 1923, pl. 86:12	seal		Neo-Assyrian
A 642	Delaporte 1923, pl. 86:8	seal		Neo-Assyrian
A 643	Delaporte 1923, pl. 86:9	seal		Neo-Assyrian
A 644	Delaporte 1923, pl. 86:10	seal		Neo-Assyrian
A 645	Delaporte 1923, pl. 86:11	seal		Neo-Assyrian
A 646	Delaporte 1923, pl. 86:15	seal		Neo-Assyrian
A 647	Delaporte 1923, pl. 86:14	seal		Neo-Assyrian
A 648	Delaporte 1923, pl. 86:13	seal		Neo-Assyrian
A 649	Delaporte 1923, pl. 86:18	seal		Neo-Assyrian
A 650	Delaporte 1923, pl. 86:16	seal		Neo-Assyrian
A 651	Delaporte 1923, pl. 86:17	seal		Neo-Assyrian
A 652	Delaporte 1923, pl. 86:19	seal		Neo-Assyrian
A 653	Delaporte 1923, pl. 86:20	seal		Neo-Assyrian
A 674	Delaporte 1923, pl. 87:17	seal		Neo-Assyrian
A 675	Delaporte 1923, pl. 87:18	seal		Neo-Assyrian
A 676	Delaporte 1923, pl. 88:1	seal		Neo-Assyrian
A 714	Delaporte 1923, pl. 89:14	seal		Neo-Assyrian
A 715	Delaporte 1923, pl. 89:16	seal		Neo-Assyrian
A.0.87.1	Grayson 1991, p. 25	inscription	Assur	Tiglath-Pileser I
A.0.89.2	Grayson 1991, p. 93	inscription	Assur	Aššur-bēl-kala

Designation	Reference	Type	Context	Date
A.0.99.2	Grayson 1991, p. 150	inscription	Assur	Adad-nirari II
A.0.101.2	Grayson 1991, p. 225-226	inscription	NW Palace	Assurnasirpal II
A.0.101.30	Grayson 1991, p. 291	inscription	NW Palace	Assurnasirpal II
A.0.102.1	Grayson 1996, p. 7	inscription	FortShal	Shalmaneser III
A.0.102.2	Grayson 1996, p. 11	inscription	Kurkh	Shalmaneser III
A.0.102.13	Grayson 1996, p. 62	inscription	Assur	Shalmaneser III
A.0.102.16	Grayson 1996, p. 84	inscription	Nimrud	Shalmaneser III
A.0.102.46	Grayson 1996, p. 128	inscription	Assur	
A.0.102.6	Grayson 1996, p. 41	inscription	Assur	Shalmaneser III
AM 1954.717	Herrmann & Laidlaw 2009, no. 46	ivory	NW Palace	
Anah Stele	Cavigneaux & Khalil Ismail 1990, no. 27	sculpture	Anah	Tiglath-Pileser III
Arslan Tash Stele	Black & Green 1997, p. 111, fig. 89	sculpture	Arslan Tash	Tiglath-Pileser III
Assurbanipal NP 2	Barnett 1976, pl. 2	relief	North Palace	Assurbanipal
Assurbanipal NP 7	Barnett 1976, pl. 7	relief	North Palace	Assurbanipal
Assurbanipal NP 8	Barnett 1976, pl. 8	relief	North Palace	Assurbanipal
Assurbanipal NP 9	Barnett 1976, pl. 9	relief	North Palace	Assurbanipal
Assurbanipal NP 11	Barnett 1976, pl. 11	relief	North Palace	Assurbanipal
Assurbanipal NP 12	Barnett 1976, pl. 12	relief	North Palace	Assurbanipal
Assurbanipal NP 13	Barnett 1976, pl. 13	relief	North Palace	Assurbanipal
Assurbanipal NP 16	Barnett 1976, pl. 16	relief	North Palace	Assurbanipal
Assurbanipal NP 17	Barnett 1976, pl. 17	relief	North Palace	Assurbanipal
Assurbanipal NP 19	Barnett 1976, pl. 19	relief	North Palace	Assurbanipal
Assurbanipal NP 20	Barnett 1976, pl. 20	relief	North Palace	Assurbanipal
Assurbanipal NP 21	Barnett 1976, pl. 21	relief	North Palace	Assurbanipal
Assurbanipal NP 22	Barnett 1976, pl. 22	relief	North Palace	Assurbanipal
Assurbanipal NP 23	Barnett 1976, pl. 23	relief	North Palace	Assurbanipal
Assurbanipal NP 25	Barnett 1976, pl. 25	relief	North Palace	Assurbanipal
Assurbanipal NP 26	Barnett 1976, pl. 26	relief	North Palace	Assurbanipal
Assurbanipal NP 28	Barnett 1976, pl. 28	relief	North Palace	Assurbanipal
Assurbanipal NP 32	Barnett 1976, pl. 32	relief	North Palace	Assurbanipal
Assurbanipal NP 33	Barnett 1976, pl. 33	relief	North Palace	Assurbanipal
Assurbanipal NP 34	Barnett 1976, pl. 34	relief	North Palace	Assurbanipal
Assurbanipal NP 35	Barnett 1976, pl. 35	relief	North Palace	Assurbanipal
Assurbanipal NP 36	Barnett 1976, pl. 36	relief	North Palace	Assurbanipal
Assurbanipal NP 39	Barnett 1976, pl. 39	relief	North Palace	Assurbanipal
Assurbanipal NP 44	Barnett 1976, pl. 44	relief	North Palace	Assurbanipal
Assurbanipal NP 46	Barnett 1976, pl. 46	relief	North Palace	Assurbanipal
Assurbanipal NP 47	Barnett 1976, pl. 47	relief	North Palace	Assurbanipal
Assurbanipal NP 48	Barnett 1976, pl. 48	relief	North Palace	Assurbanipal
Assurbanipal NP 49	Barnett 1976, pl. 49	relief	North Palace	Assurbanipal
Assurbanipal NP 50	Barnett 1976, pl. 50	relief	North Palace	Assurbanipal
Assurbanipal NP 51	Barnett 1976, pl. 51	relief	North Palace	Assurbanipal
Assurbanipal NP 52	Barnett 1976, pl. 52	relief	North Palace	Assurbanipal
Assurbanipal NP 53	Barnett 1976, pl. 53	relief	North Palace	Assurbanipal
Assurbanipal NP 54	Barnett 1976, pl. 54	relief	North Palace	Assurbanipal

Designation	Reference	Type	Context	Date
Assurbanipal NP 56	Barnett 1976, pl. 56	relief	North Palace	Assurbanipal
Assurbanipal NP 57	Barnett 1976, pl. 57	relief	North Palace	Assurbanipal
Assurbanipal NP 59	Barnett 1976, pl. 59	relief	North Palace	Assurbanipal
Assurbanipal NP 60	Barnett 1976, pl. 60	relief	North Palace	Assurbanipal
Assurbanipal NP 61	Barnett 1976, pl. 61	relief	North Palace	Assurbanipal
Assurbanipal NP 67	Barnett 1976, pl. 67	relief	North Palace	Assurbanipal
Assurbanipal NP 68	Barnett 1976, pl. 68	relief	North Palace	Assurbanipal
Assurbanipal NP 69	Barnett 1976, pl. 69	relief	North Palace	Assurbanipal
Assurbanipal NP 70	Barnett 1976, pl. 70	relief	North Palace	Assurbanipal
Assurbanipal NP 71	Barnett 1976, pl. 71	relief	North Palace	Assurbanipal
Assurbanipal NP 72	Barnett 1976, pl. 72	relief	North Palace	Assurbanipal
Assurbanipal SWP 191	Barnett, Bleibtreu & Turner 1998, pl. 191	relief	SW Palace	Assurbanipal
Assurbanipal SWP 199	Barnett, Bleibtreu & Turner 1998, pl. 199	relief	SW Palace	Assurbanipal
Assurbanipal SWP 203	Barnett, Bleibtreu & Turner 1998, pl. 203	relief	SW Palace	Assurbanipal
Assurbanipal SWP 205	Barnett, Bleibtreu & Turner 1998, pl. 205	relief	North Palace	Assurbanipal
Assurbanipal SWP 206	Barnett, Bleibtreu & Turner 1998, pl. 206	relief	SW Palace	Assurbanipal
Assurbanipal SWP 208	Barnett, Bleibtreu & Turner 1998, pl. 208	relief	SW Palace	Assurbanipal
Assurbanipal SWP 259	Barnett, Bleibtreu & Turner 1998, pl. 259	relief	SW Palace	Assurbanipal
Assurbanipal SWP 262	Barnett, Bleibtreu & Turner 1998, pl. 262	relief	SW Palace	Assurbanipal
Assurbanipal SWP 288	Barnett, Bleibtreu & Turner 1998, pl. 288	relief	SW Palace	Assurbanipal
Assurbanipal SWP 289	Barnett, Bleibtreu & Turner 1998, pl. 289	relief	SW Palace	Assurbanipal
Assurbanipal SWP 291	Barnett, Bleibtreu & Turner 1998, pl. 291	relief	SW Palace	Assurbanipal
Assurbanipal SWP 292	Barnett, Bleibtreu & Turner 1998, pl. 292	relief	SW Palace	Assurbanipal
Assurbanipal SWP 296	Barnett, Bleibtreu & Turner 1998, pl. 296	relief	SW Palace	Assurbanipal
Assurbanipal SWP 304	Barnett, Bleibtreu & Turner 1998, pl. 304	relief	SW Palace	Assurbanipal
Assurbanipal SWP 314	Barnett, Bleibtreu & Turner 1998, pl. 314	relief	SW Palace	Assurbanipal
Assurnasirpal II 12	Budge 1914, pl. 11	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 12	Budge 1914, pl. 12	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 13	Budge 1914, pl. 13	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 14	Budge 1914, pl. 14	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 15	Budge 1914, pl. 15	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 16	Budge 1914, pl. 16	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 17	Budge 1914, pl. 17	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 18	Budge 1914, pl. 18	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 19	Budge 1914, pl. 19	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 20	Budge 1914, pl. 20	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 22	Budge 1914, pl. 22	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 23	Budge 1914, pl. 23	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 24	Budge 1914, pl. 24	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 25	Budge 1914, pl. 25	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 33	Budge 1914, pl. 33	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 35	Budge 1914, pl. 35	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 42	Budge 1914, pl. 42	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 2 116	Barnett & Falkner 1962, pl. 116	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 2 117	Barnett & Falkner 1962, pl. 117	relief	NW Palace	Assurnasirpal II

Designation	Reference	Type	Context	Date
Assurnasirpal II 2 118	Barnett & Falkner 1962, pl. 118	relief	NW Palace	Assurnasirpal II
Assurnasirpal II 2 119	Barnett & Falkner 1962, pl. 119	relief	NW Palace	Assurnasirpal II
Assurnasirpal II BG 9	Curtis & Tallis 2008, fig. 9	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 11	Curtis & Tallis 2008, fig. 11	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 13	Curtis & Tallis 2008, fig. 13	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 15	Curtis & Tallis 2008, fig. 15	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 19	Curtis & Tallis 2008, fig. 19	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 21	Curtis & Tallis 2008, fig. 21	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 23	Curtis & Tallis 2008, fig. 23	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 25	Curtis & Tallis 2008, fig. 25	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 27	Curtis & Tallis 2008, fig. 27	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 28	Curtis & Tallis 2008, fig. 28	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 29	Curtis & Tallis 2008, fig. 29	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 30	Curtis & Tallis 2008, fig. 30	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 31	Curtis & Tallis 2008, fig. 31	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 32	Curtis & Tallis 2008, fig. 32	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 35	Curtis & Tallis 2008, fig. 35	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 37	Curtis & Tallis 2008, fig. 37	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 57	Curtis & Tallis 2008, fig. 57	bronze	Balawat Mamu	Assurnasirpal II
Assurnasirpal II BG 59	Curtis & Tallis 2008, fig. 59	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 69	Curtis & Tallis 2008, fig. 69	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 75	Curtis & Tallis 2008, fig. 75	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 85	Curtis & Tallis 2008, fig. 85	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 86	Curtis & Tallis 2008, fig. 86	bronze	Balawat AnpII	Assurnasirpal II
Assurnasirpal II BG 95	Curtis & Tallis 2008, fig. 95	bronze	Balawat Mamu	Assurnasirpal II
Assurnasirpal II IT 19	Reade 2005, p. 379, fig. 19	relief	Ištar Temple	Assurnasirpal II
Babylonian Chronicle	Wiseman 1956	text	Wiseman	Neo-Babylonian
Black Obelisk	Layard 1853a, pl. 53	sculpture	Nimrud	Shalmaneser III
BM 115706	Frankfort 1939, p. 212, text-fig. 64	brick	TNII Palace	Tukulti-Ninurta II
BM 118101	Herrmann & Laidlaw 2009, no. CPIb. BM 118101	ivory	Central Palace	Tiglath-Pileser III?
BM 127065	Herrmann & Laidlaw 2009, p. 230, pl. 125	ivory	Central Palace	
BM 131160	Herrmann & Laidlaw 2009, no. 61	ivory	NW Palace	
Broken Obelisk	Curtis 2007, p. 54, fig. 1	sculpture	Nineveh	Aššur-bēl-kala
Buchanan 328	Buchanan 1966, no. 328	seal	Kish	Old Akkadian
Buchanan 574	Buchanan 1966, no. 574	seal	Nimrud	Neo-Assyrian
Buchanan 575	Buchanan 1966, no. 575	seal		Neo-Assyrian
Buchanan 576	Buchanan 1966, no. 576	seal		Neo-Assyrian
Buchanan 577	Buchanan 1966, no. 577	seal		Neo-Assyrian
Buchanan 601	Buchanan 1966, no. 601	seal		Neo-Assyrian
Buchanan 602	Buchanan 1966, no. 602	seal		Neo-Assyrian
Buchanan 613	Buchanan 1966, no. 613	seal		Neo-Assyrian
Buchanan 614	Buchanan 1966, no. 614	seal		Neo-Assyrian
Buchanan 615	Buchanan 1966, no. 615	seal	Kish	Neo-Assyrian
Buchanan 616	Buchanan 1966, no. 616	seal		Neo-Assyrian
Buchanan 617	Buchanan 1966, no. 617	seal		Neo-Assyrian

Designation	Reference	Type	Context	Date
Buchanan 618	Buchanan 1966, no. 618	seal	Nimrud	Neo-Assyrian
Buchanan 624	Buchanan 1966, no. 624	seal		Neo-Assyrian
Buchanan 625	Buchanan 1966, no. 625	seal		Neo-Assyrian
Buchanan 626	Buchanan 1966, no. 626	seal		Neo-Assyrian
Buchanan 639	Buchanan 1966, no. 639	seal		Neo-Assyrian
Bull Inscription F1	Luckenbill 1924, p. 76	inscription	SW Palace	Sennacherib
Carchamish Relief	Winter 2009d, p. 558, fig. 13	relief	Carchemish	9th-8th C BC
Collon 1	Collon 2008, p. 103, fig. 1	wall pnt.	Tell Arpachiyah	Halaf Period
Collon 3	Collon 2008, p. 103, fig. 3	sculpture	Uruk	Uruk Period
Collon 5	Collon 2008, p. 104, fig. 5	seal		Uruk Period
Collon 6	Collon 2008, p. 104, fig. 6	seal	Susa	Proto-Elamite
Collon 9	Collon 2008, p. 105, fig. 9	seal		Old Akkadian
Frankfort 34a	Frankfort 1939, pl. 34a	seal		ca. 900-700 BC
Frankfort 34d	Frankfort 1939, pl. 34d	seal		ca. 900-700 BC
Frankfort 34e	Frankfort 1939, pl. 34e	seal		ca. 900-700 BC
Frankfort 34g	Frankfort 1939, pl. 34g	seal		ca. 900-700 BC
Frankfort 35a	Frankfort 1939, pl. 35a	seal		ca. 750-650 BC
Frankfort 35b	Frankfort 1939, pl. 35b	seal		ca. 750-650 BC
Hasanlu Gold Bowl	Winter 1989, p. 90, fig. 6	gold bowl	Hasanlu	9th-8th C BC
Hasanlu Silver Beaker	Winter 2009c, p. 456, fig. 1b	silver beaker	Hasanlu	9th-8th C BC
Homès-Fredericq 1b	Homès-Fredericq 1986, p. 252, fig. 1:b	seal		7th C BC
K3050+2694	Luckenbill 1927, p. 379	inscription		Assurbanipal
Karatepe Relief	Winter 2009d, p. 521, fig. 16	relief	Karatepe	9th-8th C BC
Keel-Leu & Teissier 160	Keel-Leu & Teissier 2004, no. 160	seal		11th-10th C BC
Keel-Leu & Teissier 165	Keel-Leu & Teissier 2004, no. 165	seal		9th C BC
Keel-Leu & Teissier 166	Keel-Leu & Teissier 2004, no. 166	seal		9th-8th C BC
Keel-Leu & Teissier 167	Keel-Leu & Teissier 2004, no. 167	seal		9th C BC
Keel-Leu & Teissier 168	Keel-Leu & Teissier 2004, no. 168	seal		9th-8th C BC
Keel-Leu & Teissier 170	Keel-Leu & Teissier 2004, no. 170	seal		9th-7th C BC
Keel-Leu & Teissier 171	Keel-Leu & Teissier 2004, no. 171	seal		9th-7th C BC
Keel-Leu & Teissier 172	Keel-Leu & Teissier 2004, no. 172	seal		9th-7th C BC
Keel-Leu & Teissier 173	Keel-Leu & Teissier 2004, no. 173	seal		8th-7th C BC
Keel-Leu & Teissier 174	Keel-Leu & Teissier 2004, no. 174	seal		8th-7th C BC
Keel-Leu & Teissier 175	Keel-Leu & Teissier 2004, no. 175	seal		8th-7th C BC
Keel-Leu & Teissier 176	Keel-Leu & Teissier 2004, no. 176	seal		8th-7th C BC
Keel-Leu & Teissier 177	Keel-Leu & Teissier 2004, no. 177	seal		8th-7th C BC
Keel-Leu & Teissier 178	Keel-Leu & Teissier 2004, no. 178	seal		8th-7th C BC
Keel-Leu & Teissier 180	Keel-Leu & Teissier 2004, no. 180	seal		9th-8th C BC
Keel-Leu & Teissier 181	Keel-Leu & Teissier 2004, no. 181	seal		9th-8th C BC
Keel-Leu & Teissier 190	Keel-Leu & Teissier 2004, no. 190	seal		9th-8th C BC
Keel-Leu & Teissier 191	Keel-Leu & Teissier 2004, no. 191	seal		9th-8th C BC
Keel-Leu & Teissier 192	Keel-Leu & Teissier 2004, no. 192	seal		8th C BC
Keel-Leu & Teissier 225	Keel-Leu & Teissier 2004, no. 225	seal		8th-7th C BC
Keel-Leu & Teissier 226	Keel-Leu & Teissier 2004, no. 226	seal		8th-7th C BC
Marduk-nadin-ahhe Kudurru	Russell 1998, p. 684	sculpture	Babylon	11th C BC

Designation	Reference	Type	Context	Date
Kühne 88	Kühne 1980, no. 88	seal		8th C BC
Kühne 89	Kühne 1980, no. 89	seal		9th-8th C BC
Kühne 90	Kühne 1980, no. 90	seal		9th-8th C BC
Layard 48:4	Layard 1853a, pl. 48:4	relief	NW Palace	Assurnasirpal II
Layard 48:6	Layard 1853a, pl. 48:6	relief	NW Palace	Assurnasirpal II
Layard 49:1	Layard 1853a, pl. 49:1	relief	NW Palace	Assurnasirpal II
Layard 49:3	Layard 1853a, pl. 49:3	relief	NW Palace	Assurnasirpal II
Layard 49:4	Layard 1853a, pl. 49:4	relief	NW Palace	Assurnasirpal II
Layard 50:1	Layard 1853a, pl. 50:1	relief	NW Palace	Assurnasirpal II
Malatya Relief	Wilkinson 1991, p. 96, pl. 15	relief	Malatya	9th-8th C BC
Marcus 57	Marcus 1996, no. 57	seal	Hasanlu	Neo-Assyrian
Marcus 58	Marcus 1996, no. 58	seal	Hasanlu	Neo-Assyrian
Marcus 59	Marcus 1996, no. 59	seal	Hasanlu	Neo-Assyrian
Marcus 60	Marcus 1996, no. 60	seal	Hasanlu	Neo-Assyrian
Marcus 63	Marcus 1996, no. 63	seal	Hasanlu	Neo-Assyrian
Marcus 64	Marcus 1996, no. 64	seal	Hasanlu	Neo-Assyrian
Marcus 65	Marcus 1996, no. 65	seal	Hasanlu	Neo-Assyrian
Marcus 66	Marcus 1996, no. 66	seal	Hasanlu	Neo-Assyrian
Marcus 67	Marcus 1996, no. 67	seal	Hasanlu	Neo-Assyrian
Marcus 68	Marcus 1996, no. 68	seal	Hasanlu	Neo-Assyrian
Marcus 69	Marcus 1996, no. 69	seal	Hasanlu	Neo-Assyrian
Marcus 70	Marcus 1996, no. 70	seal	Hasanlu	Neo-Assyrian
Moortgat 1	Moortgat 1940, no. 1	seal	Uruk	Uruk IV-VI
Moortgat 595	Moortgat 1940, no. 595	seal	Assur	9th-8th C BC
Moortgat 600	Moortgat 1940, no. 600	seal	Babylon	9th-8th C BC
Moortgat 616	Moortgat 1940, no. 616	seal	Babylon	Neo-Assyrian
Moortgat 624	Moortgat 1940, no. 624	seal		Neo-Assyrian
Moortgat 625	Moortgat 1940, no. 625	seal		Neo-Assyrian
Moortgat 627	Moortgat 1940, no. 627	seal		Neo-Assyrian
Moortgat 639	Moortgat 1940, no. 639	seal	Assur	9th-8th C BC
Moortgat 640	Moortgat 1940, no. 640	seal	Assur	9th-8th C BC
Moortgat 641	Moortgat 1940, no. 641	seal	Assur	9th-8th C BC
Moortgat 642	Moortgat 1940, no. 642	seal	Assur	9th-8th C BC
Moortgat 643	Moortgat 1940, no. 643	seal	Assur	9th-8th C BC
Moortgat 653	Moortgat 1940, no. 653	seal	Assur	9th-8th C BC
Moortgat 665	Moortgat 1940, no. 665	seal	Assur	9th-8th C BC
Moortgat 667	Moortgat 1940, no. 667	seal		9th-8th C BC
Moortgat 670	Moortgat 1940, no. 670	seal	Assur	9th-8th C BC
Moortgat 671	Moortgat 1940, no. 671	seal	Assur	9th-8th C BC
Moortgat 689	Moortgat 1940, no. 689	seal	Assur	9th-7th C BC
Moortgat 690	Moortgat 1940, no. 690	seal	Assur	9th-7th C BC
Moortgat 691	Moortgat 1940, no. 691	seal	Assur	9th-7th C BC
Moortgat 692	Moortgat 1940, no. 692	seal	Assur	9th-7th C BC
Moortgat 693	Moortgat 1940, no. 693	seal	Assur	9th-7th C BC
Moortgat 695	Moortgat 1940, no. 695	seal	Tell Halaf	9th-7th C BC

Designation	Reference	Type	Context	Date
Moortgat 696	Moortgat 1940, no. 696	seal	Assur	9th-7th C BC
Moortgat 697	Moortgat 1940, no. 697	seal	Assur	9th-7th C BC
Moortgat 698	Moortgat 1940, no. 698	seal	Assur	9th-7th C BC
Moortgat 699	Moortgat 1940, no. 699	seal	Assur	9th-7th C BC
Moortgat 700	Moortgat 1940, no. 700	seal	Assur	9th-7th C BC
Moortgat 701	Moortgat 1940, no. 701	seal	Tell Halaf	9th-7th C BC
Moortgat 702	Moortgat 1940, no. 702	seal	Assur	9th-7th C BC
Moortgat 703	Moortgat 1940, no. 703	seal	Assur	9th-7th C BC
Moortgat 704	Moortgat 1940, no. 704	seal	Assur	9th-7th C BC
Moortgat 705	Moortgat 1940, no. 705	seal	Assur	9th-7th C BC
Moortgat 706	Moortgat 1940, no. 706	seal	Babylon	9th-7th C BC
Moortgat 707	Moortgat 1940, no. 707	seal	Assur	9th-7th C BC
Moortgat 708	Moortgat 1940, no. 708	seal	Babylon	9th-7th C BC
Moortgat 747	Moortgat 1940, no. 747	seal		8th-7th C BC
ND 1007	Parker 1955, pl. 15:1	seal	NW Palace	9th-8th C BC
ND 1015	Parker 1955, pl. 10:4	seal	NW Palace	9th C BC
ND 1715	Mallowan & Davies 1970, no. 58	ivory	NW Palace	Neo-Assyrian
ND 1715a	Mallowan & Davies 1970, no. 55	ivory	NW Palace	9th Century BC
ND 2153	Parker 1955, pl. 15:2	seal	Burnt Palace	Sargon II
ND 2197	Parker 1955, pl. 14:3	seal	Ziggurat Terrace	8th C BC
ND 2293	Mallowan & Davies 1970, no. 27	ivory	NW Palace	Neo-Assyrian
ND 3226	Parker 1955, pl. 13:1	seal	Nimrud	9th-8th C BC
ND 3260	Parker 1955, pl. 16:2	seal	Nimrud	9th-8th C BC
ND 5247	Parker 1962, pl. 9:3	seal	Nimrud	Neo-Assyrian
ND 5294	Parker 1962, pl. 11:3	seal	Nimrud	Neo-Assyrian
ND 5364	Parker 1962, pl. 13:2	seal	Ninurta Temple	9th-8th C BC
ND 5371	Parker 1962, pl. 14:4	seal	Ninurta Temple	Neo-Assyrian
ND 6023	Parker 1962, pl. 16:5	seal	AB Building	9th-7th C BC
ND 6029	Parker 1962, pl. 16:4	seal	AB Building	Neo-Assyrian
ND 6083	Parker 1962, pl. 17:9	seal	Nimrud	9th-8th C BC
ND 6086	Parker 1962, pl. 16:6	seal	Grave PG.21	9th-8th C BC
ND 6092	Parker 1962, pl. 17:3	seal	Grave PG.21	Neo-Assyrian
ND 7904, Panel 9	Mallowan & Herrman 1974, Panel 9	ivory	FortShal	Neo-Assyrian
ND 8090	Parker 1962, pl. 18:6	seal	Nimrud	Neo-Assyrian
ND 887	Parker 1955, pl. 16:3	seal	Nimrud	8th-7th C BC
Oriental Institute Prism	Luckenbill 1924, p. 47	inscription		Sennacherib
Porada 610	Porada 1948, no. 610	seal		Neo-Assyrian
Porada 611	Porada 1948, no. 611	seal		Neo-Assyrian
Porada 612	Porada 1948, no. 612	seal		Neo-Assyrian
Porada 613	Porada 1948, no. 613	seal		Neo-Assyrian
Porada 614	Porada 1948, no. 614	seal		Neo-Assyrian
Porada 615	Porada 1948, no. 615	seal		Neo-Assyrian
Porada 616	Porada 1948, no. 616	seal		Neo-Assyrian
Porada 617	Porada 1948, no. 617	seal		Neo-Assyrian
Porada 618	Porada 1948, no. 618	seal		Neo-Assyrian

Designation	Reference	Type	Context	Date
Porada 620	Porada 1948, no. 620	seal		Neo-Assyrian
Porada 621	Porada 1948, no. 621	seal		Neo-Assyrian
Porada 622	Porada 1948, no. 622	seal		Neo-Assyrian
Porada 623	Porada 1948, no. 623	seal		Neo-Assyrian
Porada 624	Porada 1948, no. 624	seal		Neo-Assyrian
Porada 647	Porada 1948, no. 647	seal		Neo-Assyrian
Porada 661	Porada 1948, no. 661	seal		Neo-Assyrian
Porada 664	Porada 1948, no. 664	seal		Neo-Assyrian
Porada 665	Porada 1948, no. 665	seal		Neo-Assyrian
Porada 666	Porada 1948, no. 666	seal		Neo-Assyrian
Porada 667	Porada 1948, no. 667	seal		Neo-Assyrian
Porada 668	Porada 1948, no. 668	seal		Neo-Assyrian
Porada 669	Porada 1948, no. 669	seal		Neo-Assyrian
Porada 670	Porada 1948, no. 670	seal		Neo-Assyrian
Porada 671	Porada 1948, no. 671	seal		Neo-Assyrian
Porada 672	Porada 1948, no. 672	seal		Neo-Assyrian
Porada 689	Porada 1948, no. 689	seal		Neo-Assyrian
Porada 690	Porada 1948, no. 690	seal		Neo-Assyrian
Porada 719	Porada 1948, no. 719	seal		Neo-Assyrian
Porada 720	Porada 1948, no. 720	seal		Neo-Assyrian
Porada 725	Porada 1948, no. 725	seal		Neo-Assyrian
Porada 749	Porada 1948, no. 749	seal		Neo-Assyrian
Porada 778	Porada 1948, no. 778	seal		Neo-Assyrian
Rassam Obelisk	Reade 1980a, pl. 2	sculpture	Nimrud	Assurnasirpal II
Rassam Obelisk	Reade 1980a, pl. 4	sculpture	Nimrud	Assurnasirpal II
RINAP I, Tiglath-Pileser III 9	RINAP I, Tiglath-Pileser III 9	inscription	Nimrud	Tiglath-Pileser III
RINAP I, Tiglath-pileser III 28	RINAP I, Tiglath-pileser III 28	inscription		Tiglath-Pileser III
RINAP I, Tiglath-Pileser III 35	RINAP I, Tiglath-Pileser III 35	inscription	Iran	Tiglath-Pileser III
RINAP III, Sennacherib 3	RINAP III, Sennacherib 3	inscription	Assur, Nineveh	Sennacherib
RINAP III, Sennacherib 4	RINAP III, Sennacherib 4	inscription	Assur, Nineveh	Sennacherib
RINAP III, Sennacherib 15	RINAP III, Sennacherib 15	inscription	Assur, Nineveh	Sennacherib
RINAP III, Sennacherib 16	RINAP III, Sennacherib 16	inscription	Assur, Nimrud, Nineveh	Sennacherib
RINAP III, Sennacherib 18	RINAP III, Sennacherib 18	inscription	Nineveh	Sennacherib
RINAP III, Sennacherib 22	RINAP III, Sennacherib 22	inscription	Nineveh	Sennacherib
RINAP III, Sennacherib 23	RINAP III, Sennacherib 23	inscription	Nineveh	Sennacherib
RINAP III, Sennacherib 25	RINAP III, Sennacherib 25	inscription	Nineveh	Sennacherib
RINAP IV, Esarhaddon 1	RINAP IV, Esarhaddon 1	inscription	Assur, Nineveh, Susa	Esarhaddon
RINAP IV, Esarhaddon 2	RINAP IV, Esarhaddon 2	inscription	Nineveh	Esarhaddon
RINAP IV, Esarhaddon 5	RINAP IV, Esarhaddon 5	inscription	Nineveh	Esarhaddon
RINAP IV, Esarhaddon 6	RINAP IV, Esarhaddon 6	inscription	Nineveh	Esarhaddon
RINAP IV, Esarhaddon 8	RINAP IV, Esarhaddon 8	inscription	Nineveh	Esarhaddon
RINAP IV, Esarhaddon 57	RINAP IV, Esarhaddon 57	inscription	Assur	Esarhaddon
RINAP IV, Esarhaddon 98	RINAP IV, Esarhaddon 98	inscription	Zincirli	Esarhaddon
RINAP IV, Esarhaddon 128	RINAP IV, Esarhaddon 128	inscription	Nippur	Esarhaddon

Designation	Reference	Type	Context	Date
Room I Epigraph	Russell 1999, p. 173	inscription	North Palace	Assurbanipal
Russell 174	Russell 1999, p. 174	relief	SW Palace	Assurbanipal
Russell 176	Russell 1999, p. 176	relief	North Palace	Assurbanipal
SAA I 179	SAA I 179	text		Sargon II
SAA II 2	SAA II 2	treaty		Aššur-nirari V
SAA II 4	SAA II 4	treaty		Esarhaddon
SAA II 5	SAA II 5	treaty		Esarhaddon
SAA II 6	SAA II 6	treaty		Esarhaddon
SAA II 9	SAA II 9	treaty		Assurbanipal
SAA III 2	SAA III 2	lit. text		Assurbanipal
SAA III 3	SAA III 3	lit. text		Assurbanipal
SAA III 17	SAA III 17	lit. text		Assurnasirpal II
SAA III 18	SAA III 18	lit. text		Sargon II
SAA III 22	SAA III 22	lit. text		Assurbanipal
SAA III 32	SAA III 32	lit. text		Neo-Assyrian
SAA III 36	SAA III 36	lit. text		Neo-Assyrian
SAA III 37	SAA III 37	lit. text		Neo-Assyrian
SAA III 38	SAA III 38	lit. text		Neo-Assyrian
SAA III 44	SAA III 44	lit. text		Assurbanipal
SAA III 46	SAA III 46	lit. text		Neo-Assyrian
SAA III 50	SAA III 50	lit. text		Neo-Assyrian
SAA V 16	SAA V 16	text		Sargon II
SAA V 101	SAA V 101	text		Sargon II
SAA V 215	SAA V 215	text		Sargon II
SAA VI 2	SAA VI 2	text		Neo-Assyrian
SAA VI 6	SAA VI 6	text		Neo-Assyrian
SAA VI 11	SAA VI 11	text		Neo-Assyrian
SAA VI 19	SAA VI 19	text		Neo-Assyrian
SAA VI 20	SAA VI 20	text		Neo-Assyrian
SAA VI 32	SAA VI 32	text		Neo-Assyrian
SAA VI 42	SAA VI 42	text		Neo-Assyrian
SAA VII 63	SAA VII 63	text		Neo-Assyrian
SAA VII 89	SAA VII 89	text		Neo-Assyrian
SAA VII 126	SAA VII 126	text		Neo-Assyrian
SAA XI 27	SAA XI 27	text		Neo-Assyrian
SAA XI 127	SAA XI 127	text		Neo-Assyrian
SAA XI 128	SAA XI 128	text		Neo-Assyrian
SAA XI 169	SAA XI 169	text		Neo-Assyrian
SAA XV 125	SAA XV 125	text		Sargon II
SAA XV 166	SAA XV 166	text		Sargon II
SAA XVII 70	SAA XVII 70	text		Neo-Assyrian
SAA XVII 158	SAA XVII 158	text		Neo-Assyrian
SAA XVIII 115	SAA XVIII 115	text		Esarhaddon
SAA XVIII 125	SAA XVIII 125	text		Esarhaddon
SAA XIX 125	SAA XIX 125	text		Neo-Assyrian

Designation	Reference	Type	Context	Date
Sakçagözü Relief	Ussishkin 1966, p. 19, fig. 3	relief	Sakçagözü	9th-8th C BC
Sargon II 29	Albenda 1986, pl. 29	relief	Khorsabad	Sargon II
Sargon II 30	Albenda 1986, pl. 30	relief	Khorsabad	Sargon II
Sargon II 45	Albenda 1986, pl. 45	relief	Khorsabad	Sargon II
Sargon II 70	Albenda 1986, pl. 70	relief	Khorsabad	Sargon II
Sargon II 74	Albenda 1986, pl. 74	relief	Khorsabad	Sargon II
Sargon II 76	Albenda 1986, pl. 76	relief	Khorsabad	Sargon II
Sargon II 77	Albenda 1986, pl. 77	relief	Khorsabad	Sargon II
Sargon II 78	Albenda 1986, pl. 78	relief	Khorsabad	Sargon II
Sargon II 87	Albenda 1986, pl. 87	relief	Khorsabad	Sargon II
Sargon II 94	Albenda 1986, pl. 94	relief	Khorsabad	Sargon II
Sargon II 95	Albenda 1986, pl. 95	relief	Khorsabad	Sargon II
Sargon II 96	Albenda 1986, pl. 96	relief	Khorsabad	Sargon II
Sargon II 97	Albenda 1986, pl. 97	relief	Khorsabad	Sargon II
Sargon II 98	Albenda 1986, pl. 98	relief	Khorsabad	Sargon II
Sargon II 99	Albenda 1986, pl. 99	relief	Khorsabad	Sargon II
Sargon II 100	Albenda 1986, pl. 100	relief	Khorsabad	Sargon II
Sargon II 101	Albenda 1986, pl. 101	relief	Khorsabad	Sargon II
Sargon II 102	Albenda 1986, pl. 102	relief	Khorsabad	Sargon II
Sargon II 107	Albenda 1986, pl. 107	relief	Khorsabad	Sargon II
Sargon II 111	Albenda 1986, pl. 111	relief	Khorsabad	Sargon II
Sargon II 112	Albenda 1986, pl. 112	relief	Khorsabad	Sargon II
Sargon II 113	Albenda 1986, pl. 113	relief	Khorsabad	Sargon II
Sargon II 114	Albenda 1986, pl. 114	relief	Khorsabad	Sargon II
Sargon II 116	Albenda 1986, pl. 116	relief	Khorsabad	Sargon II
Sargon II 117	Albenda 1986, pl. 117	relief	Khorsabad	Sargon II
Sargon II 118	Albenda 1986, pl. 118	relief	Khorsabad	Sargon II
Sargon II 119	Albenda 1986, pl. 119	relief	Khorsabad	Sargon II
Sargon II 120	Albenda 1986, pl. 120	relief	Khorsabad	Sargon II
Sargon II 121	Albenda 1986, pl. 121	relief	Khorsabad	Sargon II
Sargon II 122	Albenda 1986, pl. 122	relief	Khorsabad	Sargon II
Sargon II 123	Albenda 1986, pl. 123	relief	Khorsabad	Sargon II
Sargon II 124	Albenda 1986, pl. 124	relief	Khorsabad	Sargon II
Sargon II 128	Albenda 1986, pl. 128	relief	Khorsabad	Sargon II
Sargon II 129	Albenda 1986, pl. 129	relief	Khorsabad	Sargon II
Sargon II 130	Albenda 1986, pl. 130	relief	Khorsabad	Sargon II
Sargon II 134	Albenda 1986, pl. 134	relief	Khorsabad	Sargon II
Sargon II 136	Albenda 1986, pl. 136	relief	Khorsabad	Sargon II
Sargon II 137	Albenda 1986, pl. 137	relief	Khorsabad	Sargon II
Sargon II 138	Albenda 1986, pl. 138	relief	Khorsabad	Sargon II
Sargon II F76	Albenda 1986, fig. 76	relief	Khorsabad	Sargon II
Sargon II F77	Albenda 1986, fig. 77	relief	Khorsabad	Sargon II
Sargon II F78	Albenda 1986, fig. 78	relief	Khorsabad	Sargon II
Sargon II F88	Albenda 1986, fig. 88	relief	Khorsabad	Sargon II
Sennacherib 27	Barnett, Bleibtreu & Turner 1998, pl. 27	relief	SW Palace	Sennacherib

Designation	Reference	Type	Context	Date
Sennacherib 28	Barnett, Bleibtreu & Turner 1998, pl. 28	relief	SW Palace	Sennacherib
Sennacherib 29	Barnett, Bleibtreu & Turner 1998, pl. 29	relief	SW Palace	Sennacherib
Sennacherib 36	Barnett, Bleibtreu & Turner 1998, pl. 36	relief	SW Palace	Sennacherib
Sennacherib 39	Barnett, Bleibtreu & Turner 1998, pl. 39	relief	SW Palace	Sennacherib
Sennacherib 42	Barnett, Bleibtreu & Turner 1998, pl. 42	relief	SW Palace	Sennacherib
Sennacherib 43	Barnett, Bleibtreu & Turner 1998, pl. 43	relief	SW Palace	Sennacherib
Sennacherib 44	Barnett, Bleibtreu & Turner 1998, pl. 44	relief	SW Palace	Sennacherib
Sennacherib 46	Barnett, Bleibtreu & Turner 1998, pl. 46	relief	SW Palace	Sennacherib
Sennacherib 48	Barnett, Bleibtreu & Turner 1998, pl. 48	relief	SW Palace	Sennacherib
Sennacherib 49	Barnett, Bleibtreu & Turner 1998, pl. 49	relief	SW Palace	Sennacherib
Sennacherib 54	Barnett, Bleibtreu & Turner 1998, pl. 54	relief	SW Palace	Sennacherib
Sennacherib 55	Barnett, Bleibtreu & Turner 1998, pl. 55	relief	SW Palace	Sennacherib
Sennacherib 57	Barnett, Bleibtreu & Turner 1998, pl. 57	relief	SW Palace	Sennacherib
Sennacherib 60	Barnett, Bleibtreu & Turner 1998, pl. 60	relief	SW Palace	Sennacherib
Sennacherib 62	Barnett, Bleibtreu & Turner 1998, pl. 62	relief	SW Palace	Sennacherib
Sennacherib 64	Barnett, Bleibtreu & Turner 1998, pl. 64	relief	SW Palace	Sennacherib
Sennacherib 66	Barnett, Bleibtreu & Turner 1998, pl. 66	relief	SW Palace	Sennacherib
Sennacherib 68	Barnett, Bleibtreu & Turner 1998, pl. 68	relief	SW Palace	Sennacherib
Sennacherib 69	Barnett, Bleibtreu & Turner 1998, pl. 69	relief	SW Palace	Sennacherib
Sennacherib 70	Barnett, Bleibtreu & Turner 1998, pl. 70	relief	SW Palace	Sennacherib
Sennacherib 71	Barnett, Bleibtreu & Turner 1998, pl. 71	relief	SW Palace	Sennacherib
Sennacherib 72	Barnett, Bleibtreu & Turner 1998, pl. 72	relief	SW Palace	Sennacherib
Sennacherib 73	Barnett, Bleibtreu & Turner 1998, pl. 73	relief	SW Palace	Sennacherib
Sennacherib 74	Barnett, Bleibtreu & Turner 1998, pl. 74	relief	SW Palace	Sennacherib
Sennacherib 75	Barnett, Bleibtreu & Turner 1998, pl. 75	relief	SW Palace	Sennacherib
Sennacherib 80	Barnett, Bleibtreu & Turner 1998, pl. 80	relief	SW Palace	Sennacherib
Sennacherib 82	Barnett, Bleibtreu & Turner 1998, pl. 82	relief	SW Palace	Sennacherib
Sennacherib 84	Barnett, Bleibtreu & Turner 1998, pl. 84	relief	SW Palace	Sennacherib
Sennacherib 85	Barnett, Bleibtreu & Turner 1998, pl. 85	relief	SW Palace	Sennacherib
Sennacherib 86	Barnett, Bleibtreu & Turner 1998, pl. 86	relief	SW Palace	Sennacherib
Sennacherib 87	Barnett, Bleibtreu & Turner 1998, pl. 87	relief	SW Palace	Sennacherib
Sennacherib 88	Barnett, Bleibtreu & Turner 1998, pl. 88	relief	SW Palace	Sennacherib
Sennacherib 89	Barnett, Bleibtreu & Turner 1998, pl. 89	relief	SW Palace	Sennacherib
Sennacherib 92	Barnett, Bleibtreu & Turner 1998, pl. 92	relief	SW Palace	Sennacherib
Sennacherib 93	Barnett, Bleibtreu & Turner 1998, pl. 93	relief	SW Palace	Sennacherib
Sennacherib 94	Barnett, Bleibtreu & Turner 1998, pl. 94	relief	SW Palace	Sennacherib
Sennacherib 112	Barnett, Bleibtreu & Turner 1998, pl. 112	relief	SW Palace	Sennacherib
Sennacherib 130	Barnett, Bleibtreu & Turner 1998, pl. 130	relief	SW Palace	Sennacherib
Sennacherib 132	Barnett, Bleibtreu & Turner 1998, pl. 132	relief	SW Palace	Sennacherib
Sennacherib 136	Barnett, Bleibtreu & Turner 1998, pl. 136	relief	SW Palace	Sennacherib
Sennacherib 137	Barnett, Bleibtreu & Turner 1998, pl. 137	relief	SW Palace	Sennacherib
Sennacherib 140	Barnett, Bleibtreu & Turner 1998, pl. 140	relief	SW Palace	Sennacherib
Sennacherib 145	Barnett, Bleibtreu & Turner 1998, pl. 145	relief	SW Palace	Sennacherib
Sennacherib 146	Barnett, Bleibtreu & Turner 1998, pl. 146	relief	SW Palace	Sennacherib
Sennacherib 147	Barnett, Bleibtreu & Turner 1998, pl. 147	relief	SW Palace	Sennacherib

Designation	Reference	Type	Context	Date
Sennacherib 152	Barnett, Bleibtreu & Turner 1998, pl. 152	relief	SW Palace	Sennacherib
Sennacherib 153	Barnett, Bleibtreu & Turner 1998, pl. 153	relief	SW Palace	Sennacherib
Sennacherib 158	Barnett, Bleibtreu & Turner 1998, pl. 158	relief	SW Palace	Sennacherib
Sennacherib 159	Barnett, Bleibtreu & Turner 1998, pl. 159	relief	SW Palace	Sennacherib
Sennacherib 164	Barnett, Bleibtreu & Turner 1998, pl. 164	relief	SW Palace	Sennacherib
Sennacherib 165	Barnett, Bleibtreu & Turner 1998, pl. 165	relief	SW Palace	Sennacherib
Sennacherib 166	Barnett, Bleibtreu & Turner 1998, pl. 166	relief	SW Palace	Sennacherib
Sennacherib 167	Barnett, Bleibtreu & Turner 1998, pl. 167	relief	SW Palace	Sennacherib
Sennacherib 168	Barnett, Bleibtreu & Turner 1998, pl. 168	relief	SW Palace	Sennacherib
Sennacherib 169	Barnett, Bleibtreu & Turner 1998, pl. 169	relief	SW Palace	Sennacherib
Sennacherib 170	Barnett, Bleibtreu & Turner 1998, pl. 170	relief	SW Palace	Sennacherib
Sennacherib 172	Barnett, Bleibtreu & Turner 1998, pl. 172	relief	SW Palace	Sennacherib
Sennacherib 174	Barnett, Bleibtreu & Turner 1998, pl. 174	relief	SW Palace	Sennacherib
Sennacherib 178	Barnett, Bleibtreu & Turner 1998, pl. 178	relief	SW Palace	Sennacherib
Sennacherib 180	Barnett, Bleibtreu & Turner 1998, pl. 180	relief	SW Palace	Sennacherib
Sennacherib 181	Barnett, Bleibtreu & Turner 1998, pl. 181	relief	SW Palace	Sennacherib
Sennacherib 182	Barnett, Bleibtreu & Turner 1998, pl. 182	relief	SW Palace	Sennacherib
Sennacherib 184	Barnett, Bleibtreu & Turner 1998, pl. 184	relief	SW Palace	Sennacherib
Sennacherib 186	Barnett, Bleibtreu & Turner 1998, pl. 186	relief	SW Palace	Sennacherib
Sennacherib 193	Barnett, Bleibtreu & Turner 1998, pl. 193	relief	SW Palace	Assurbanipal
Sennacherib 194	Barnett, Bleibtreu & Turner 1998, pl. 194	relief	SW Palace	Assurbanipal
Sennacherib 214	Barnett, Bleibtreu & Turner 1998, pl. 214	relief	SW Palace	Assurbanipal
Sennacherib 229	Barnett, Bleibtreu & Turner 1998, pl. 229	relief	SW Palace	Sennacherib
Sennacherib 236	Barnett, Bleibtreu & Turner 1998, pl. 236	relief	SW Palace	Assurbanipal
Sennacherib 242	Barnett, Bleibtreu & Turner 1998, pl. 242	relief	SW Palace	Assurbanipal
Sennacherib 252	Barnett, Bleibtreu & Turner 1998, pl. 252	relief	SW Palace	Assurbanipal
Sennacherib 256	Barnett, Bleibtreu & Turner 1998, pl. 256	relief	SW Palace	Assurbanipal
Sennacherib 260	Barnett, Bleibtreu & Turner 1998, pl. 260	relief	SW Palace	Assurbanipal
Sennacherib 265	Barnett, Bleibtreu & Turner 1998, pl. 265	relief	SW Palace	Assurbanipal
Sennacherib 269	Barnett, Bleibtreu & Turner 1998, pl. 269	relief	SW Palace	Sennacherib
Sennacherib 270	Barnett, Bleibtreu & Turner 1998, pl. 270	relief	SW Palace	Sennacherib
Sennacherib 272	Barnett, Bleibtreu & Turner 1998, pl. 272	relief	SW Palace	Sennacherib
Sennacherib 275	Barnett, Bleibtreu & Turner 1998, pl. 275	relief	SW Palace	Sennacherib
Sennacherib 276	Barnett, Bleibtreu & Turner 1998, pl. 276	relief	SW Palace	Sennacherib
Sennacherib 278	Barnett, Bleibtreu & Turner 1998, pl. 278	relief	SW Palace	Sennacherib
Sennacherib 280	Barnett, Bleibtreu & Turner 1998, pl. 280	relief	SW Palace	Sennacherib
Sennacherib 281	Barnett, Bleibtreu & Turner 1998, pl. 281	relief	SW Palace	Sennacherib
Sennacherib 283	Barnett, Bleibtreu & Turner 1998, pl. 283	relief	SW Palace	Sennacherib
Sennacherib 324	Barnett, Bleibtreu & Turner 1998, pl. 324	relief	SW Palace	Sennacherib
Sennacherib 325	Barnett, Bleibtreu & Turner 1998, pl. 325	relief	SW Palace	Sennacherib
Sennacherib 326	Barnett, Bleibtreu & Turner 1998, pl. 326	relief	SW Palace	Sennacherib
Sennacherib 327	Barnett, Bleibtreu & Turner 1998, pl. 327	relief	SW Palace	Sennacherib
Sennacherib 328	Barnett, Bleibtreu & Turner 1998, pl. 328	relief	SW Palace	Sennacherib
Sennacherib 329	Barnett, Bleibtreu & Turner 1998, pl. 329	relief	SW Palace	Sennacherib
Sennacherib 330	Barnett, Bleibtreu & Turner 1998, pl. 330	relief	SW Palace	Sennacherib

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Sennacherib 332	Barnett, Bleibtreu & Turner 1998, pl. 332	relief	SW Palace	Sennacherib
Sennacherib 335	Barnett, Bleibtreu & Turner 1998, pl. 335	relief	SW Palace	Sennacherib
Sennacherib 336	Barnett, Bleibtreu & Turner 1998, pl. 336	relief	SW Palace	Sennacherib
Sennacherib 338	Barnett, Bleibtreu & Turner 1998, pl. 338	relief	SW Palace	Sennacherib
Sennacherib 342	Barnett, Bleibtreu & Turner 1998, pl. 342	relief	SW Palace	Sennacherib
Sennacherib 346	Barnett, Bleibtreu & Turner 1998, pl. 346	relief	SW Palace	Sennacherib
Sennacherib 354	Barnett, Bleibtreu & Turner 1998, pl. 354	relief	SW Palace	Sennacherib
Sennacherib 359	Barnett, Bleibtreu & Turner 1998, pl. 359	relief	SW Palace	Sennacherib
Sennacherib 366	Barnett, Bleibtreu & Turner 1998, pl. 366	relief	SW Palace	Sennacherib
Sennacherib 371	Barnett, Bleibtreu & Turner 1998, pl. 371	relief	SW Palace	Sennacherib
Sennacherib 374	Barnett, Bleibtreu & Turner 1998, pl. 374	relief	SW Palace	Sennacherib
Sennacherib 375	Barnett, Bleibtreu & Turner 1998, pl. 375	relief	SW Palace	Sennacherib
Sennacherib 377	Barnett, Bleibtreu & Turner 1998, pl. 377	relief	SW Palace	Sennacherib
Sennacherib 379	Barnett, Bleibtreu & Turner 1998, pl. 379	relief	SW Palace	Sennacherib
Sennacherib 381	Barnett, Bleibtreu & Turner 1998, pl. 381	relief	SW Palace	Sennacherib
Sennacherib 382	Barnett, Bleibtreu & Turner 1998, pl. 382	relief	SW Palace	Sennacherib
Sennacherib 386	Barnett, Bleibtreu & Turner 1998, pl. 386	relief	SW Palace	Sennacherib
Sennacherib 388	Barnett, Bleibtreu & Turner 1998, pl. 388	relief	SW Palace	Sennacherib
Sennacherib 389	Barnett, Bleibtreu & Turner 1998, pl. 389	relief	SW Palace	Sennacherib
Sennacherib 393	Barnett, Bleibtreu & Turner 1998, pl. 393	relief	SW Palace	Sennacherib
Sennacherib 394	Barnett, Bleibtreu & Turner 1998, pl. 394	relief	SW Palace	Sennacherib
Sennacherib 396	Barnett, Bleibtreu & Turner 1998, pl. 396	relief	SW Palace	Sennacherib
Sennacherib 398	Barnett, Bleibtreu & Turner 1998, pl. 398	relief	SW Palace	Sennacherib
Sennacherib 400	Barnett, Bleibtreu & Turner 1998, pl. 400	relief	SW Palace	Sennacherib
Sennacherib 401	Barnett, Bleibtreu & Turner 1998, pl. 401	relief	SW Palace	Sennacherib
Sennacherib 403	Barnett, Bleibtreu & Turner 1998, pl. 403	relief	SW Palace	Sennacherib
Sennacherib 454	Barnett, Bleibtreu & Turner 1998, pl. 454	relief	SW Palace	Sennacherib
Sennacherib 456	Barnett, Bleibtreu & Turner 1998, pl. 456	relief	SW Palace	Sennacherib
Sennacherib 457	Barnett, Bleibtreu & Turner 1998, pl. 457	relief	SW Palace	Sennacherib
Sennacherib 458	Barnett, Bleibtreu & Turner 1998, pl. 458	relief	SW Palace	Sennacherib
Sennacherib 464	Barnett, Bleibtreu & Turner 1998, pl. 464	relief	SW Palace	Sennacherib
Sennacherib 466	Barnett, Bleibtreu & Turner 1998, pl. 466	relief	SW Palace	Sennacherib
Sennacherib 468	Barnett, Bleibtreu & Turner 1998, pl. 468	relief	SW Palace	Sennacherib
Sennacherib 470	Barnett, Bleibtreu & Turner 1998, pl. 470	relief	SW Palace	Sennacherib
Sennacherib 471	Barnett, Bleibtreu & Turner 1998, pl. 471	relief	SW Palace	Sennacherib
Sennacherib 483	Barnett, Bleibtreu & Turner 1998, pl. 483	relief	SW Palace	Sennacherib
Sennacherib 485	Barnett, Bleibtreu & Turner 1998, pl. 485	relief	SW Palace	Sennacherib
Sennacherib 502	Barnett, Bleibtreu & Turner 1998, pl. 502	relief	SW Palace	Sennacherib
Sennacherib 506	Barnett, Bleibtreu & Turner 1998, pl. 506	relief	SW Palace	Sennacherib
Sennacherib 507	Barnett, Bleibtreu & Turner 1998, pl. 507	relief	SW Palace	Sennacherib
Sennacherib 508	Barnett, Bleibtreu & Turner 1998, pl. 508	relief	SW Palace	Sennacherib
Sennacherib 511	Barnett, Bleibtreu & Turner 1998, pl. 511	relief	SW Palace	Sennacherib
Shalmaneser III 1	King 1915, pl. 1	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 2	King 1915, pl. 2	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 3	King 1915, pl. 3	bronze	Balawat ShalIII	Shalmaneser III

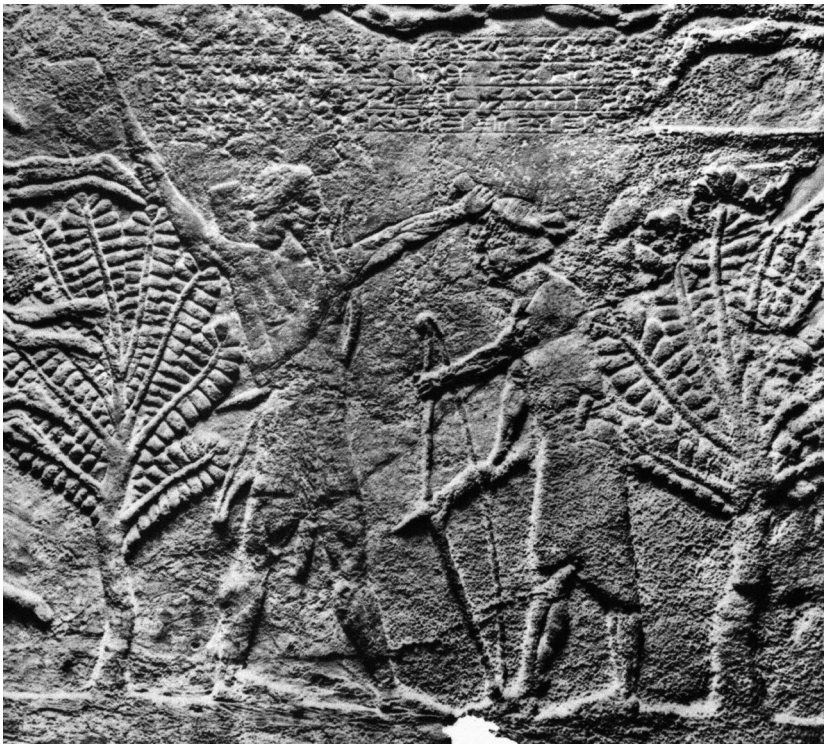
Designation	Reference	Type	Context	Date
Shalmaneser III 5	King 1915, pl. 5	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 7	King 1915, pl. 7	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 8	King 1915, pl. 8	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 9	King 1915, pl. 9	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 10	King 1915, pl. 10	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 13	King 1915, pl. 13	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 14	King 1915, pl. 14	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 15	King 1915, pl. 15	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 17	King 1915, pl. 17	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 19	King 1915, pl. 19	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 20	King 1915, pl. 20	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 21	King 1915, pl. 21	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 22	King 1915, pl. 22	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 23	King 1915, pl. 23	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 24	King 1915, pl. 24	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 28	King 1915, pl. 28	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 29	King 1915, pl. 29	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 30	King 1915, pl. 30	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 34	King 1915, pl. 34	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 35	King 1915, pl. 35	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 36	King 1915, pl. 36	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 38	King 1915, pl. 38	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 40	King 1915, pl. 40	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 41	King 1915, pl. 41	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 42	King 1915, pl. 42	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 43	King 1915, pl. 43	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 44	King 1915, pl. 44	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 45	King 1915, pl. 45	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 46	King 1915, pl. 46	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 47	King 1915, pl. 47	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 48	King 1915, pl. 48	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 49	King 1915, pl. 49	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 50	King 1915, pl. 50	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 51	King 1915, pl. 51	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 52	King 1915, pl. 52	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 53	King 1915, pl. 53	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 55	King 1915, pl. 55	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 56	King 1915, pl. 56	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 57	King 1915, pl. 57	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 58	King 1915, pl. 58	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 59	King 1915, pl. 59	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 60	King 1915, pl. 60	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 61	King 1915, pl. 61	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 62	King 1915, pl. 62	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 65	King 1915, pl. 65	bronze	Balawat ShalIII	Shalmaneser III

Designation	Reference	Type	Context	Date
Shalmaneser III 66	King 1915, pl. 66	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 67	King 1915, pl. 67	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 68	King 1915, pl. 68	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 69	King 1915, pl. 69	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 70	King 1915, pl. 70	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 71	King 1915, pl. 71	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 72	King 1915, pl. 72	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 73	King 1915, pl. 73	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 74	King 1915, pl. 74	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 75	King 1915, pl. 75	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 76	King 1915, pl. 76	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III 77	King 1915, pl. 77	bronze	Balawat ShalIII	Shalmaneser III
Shalmaneser III Throne Base	Oates 1963, pls. 4b & 6a	sculpture	FortShal	Shalmaneser III
Stele of Naram-Sin	Wilkinson 1991, pp. 84	sculpture	Susa	Old Akkadian
TCL 12, nr. 114	Salonen 1965, p. 42	text		Neo-Babylonian
TCL XII, no. 114	Dandamaev & Lukonin 1989, p. 226	text		Neo-Babylonian
Tell Halaf Relief	Winter 2009e, p. 403, fig. 13	relief	Tell Halaf	9th C BC
Tiglath-Pileser III 7	Barnett & Falkner 1962, pl. 7	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 10	Barnett & Falkner 1962, pl. 10	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 11	Barnett & Falkner 1962, pl. 11	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 14	Barnett & Falkner 1962, pl. 14	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 15	Barnett & Falkner 1962, pl. 15	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 16	Barnett & Falkner 1962, pl. 16	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 18	Barnett & Falkner 1962, pl. 18	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 27	Barnett & Falkner 1962, pl. 27	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 31	Barnett & Falkner 1962, pl. 31	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 33	Barnett & Falkner 1962, pl. 33	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 35	Barnett & Falkner 1962, pl. 35	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 39	Barnett & Falkner 1962, pl. 39	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 41	Barnett & Falkner 1962, pl. 41	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 48	Barnett & Falkner 1962, pl. 48	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 50	Barnett & Falkner 1962, pl. 50	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 52	Barnett & Falkner 1962, pl. 52	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 54	Barnett & Falkner 1962, pl. 54	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 58	Barnett & Falkner 1962, pl. 58	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 59	Barnett & Falkner 1962, pl. 59	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 62	Barnett & Falkner 1962, pl. 62	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 66	Barnett & Falkner 1962, pl. 66	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 67	Barnett & Falkner 1962, pl. 67	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 68	Barnett & Falkner 1962, pl. 68	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 72	Barnett & Falkner 1962, pl. 72	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 73	Barnett & Falkner 1962, pl. 73	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 74	Barnett & Falkner 1962, pl. 74	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 75	Barnett & Falkner 1962, pl. 75	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 76	Barnett & Falkner 1962, pl. 76	relief	Central Palace	Tiglath-Pileser III

Designation	Reference	Type	Context	Date
Tiglath-Pileser III 77	Barnett & Falkner 1962, pl. 77	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 78	Barnett & Falkner 1962, pl. 78	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 84	Barnett & Falkner 1962, pl. 84	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 86	Barnett & Falkner 1962, pl. 86	relief	Central Palace	Tiglath-Pileser III
Tiglath-Pileser III 89	Barnett & Falkner 1962, pl. 89	relief	Central Palace	Tiglath-Pileser III
Til Barsip Wall Painting	Thureau-Dangin & Dunand 1936, pl. 53	wall pnt.	Til Barsip	8th-7th C BC
Tomb of Userhet	Yadin 1963, p. 186	wall pnt.	Egypt	Amenhotep II
Tutankhamon Box	Yadin 1963, pp. 214-215	painting	Egypt	Tutankhamon
UCP 9 275 No. 3	Ebeling 1950, pp. 209-210	text		Achaemenid
Ugarit Gold Bowl	Yadin 1963, p. 187	gold sheet	Ugarit	15th-14th C BC
VA ASS 5887	Klengel-Brandt & Radner 2006, fig. 229	seal	Assur	Neo-Assyrian
White Obelisk	Sollberger 1974, pls. 42-45	sculpture	Nineveh	Assurnasirpal II
YOS 6, no. 236	Dandamaev & Lukonin 1989, p. 226	text		Neo-Babylonian
YOS 6, no. 237	Dougherty 1920 (YOS 6), nr, 237, 3	text		Neo-Babylonian
Zahlhaas 1	Zahlhaas 1993, p. 47, fig. 1	bronze	Urartu	9th-8th C BC
Zahlhaas 2	Zahlhaas 1993, p. 50, fig. 2	bronze	Urartu	9th-8th C BC
Zincirli Relief	Winter 2009d, p.519, fig. 11	relief	Zincirli	9th C BC

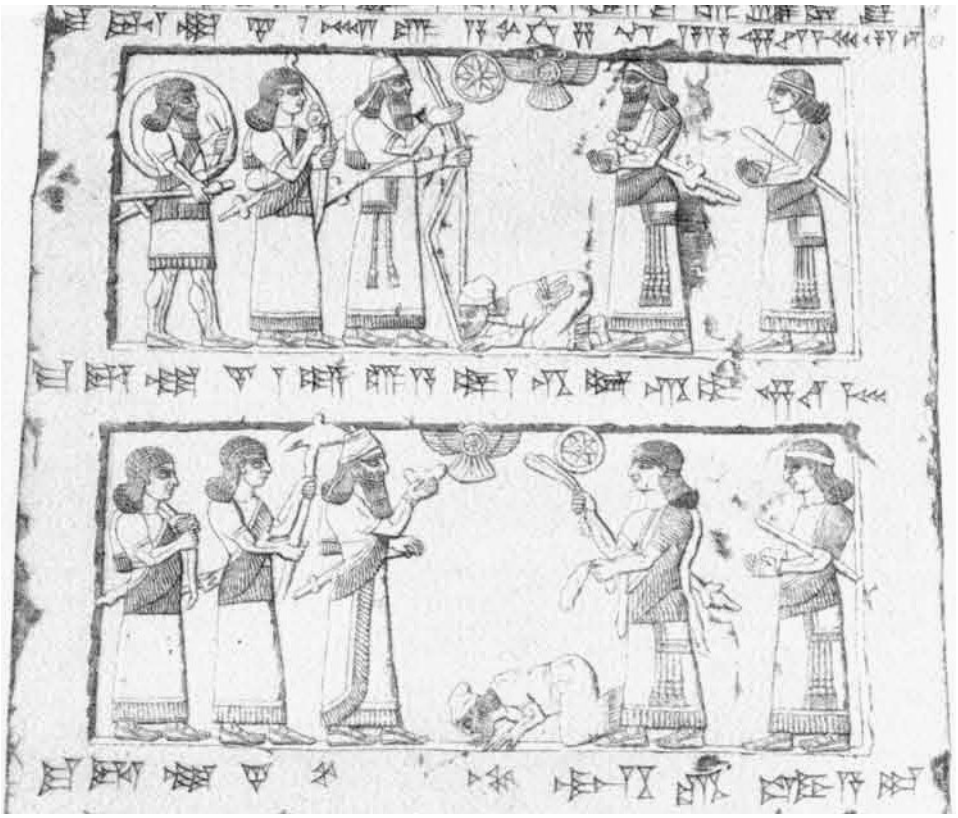
Plate 1

A



The Elamite officer Ituni cuts his bow as a symbol of his surrender, from the reliefs of Sennacherib in the North Palace; after Barnett 1976, pl. 24.

B



Two scenes of the king receiving the submission of foreign rulers from the Black Obelisk of Shalmaneser III. Note the turned bow in the top scene but its absence in the lower; after Layard 1853a, pl. 53.

Plate 2

A

Devotional scene with figure holding a turned bow from a Neo-Assyrian seal; after Porada 1948, pl. 97, no. 665.

B

Devotional scene from a Neo-Assyrian seal, where Ištar holds a turned bow while astride a lion; after SAA IX, XXVII, fig. 8 (detail of Frankfort 1939, pl. 35:a).

C

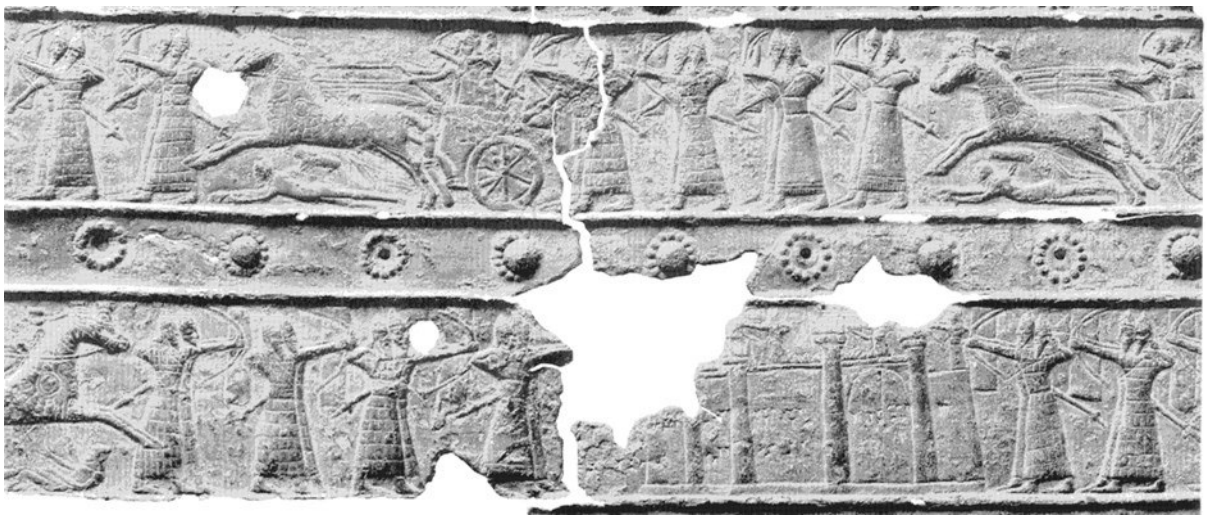
Ištar astride a lion holding a forward-pointing bow, from a Neo-Assyrian seal; after Klengel-Brandt 2006, fig. 229.

Plate 3

A

The king, charioteers and armored archers performing heroic overdraws, from the Balawat Gates of Shalmaneser III; after King 1915, pl. 74.

B



Armored and unarmored archers, most of whom draw their bows normally, however the archer just to the right of the city in the lower register clearly performs a heroic overdraw. From the Balawat Gates of Shalmaneser III; after King 1915, pl. 70.

C

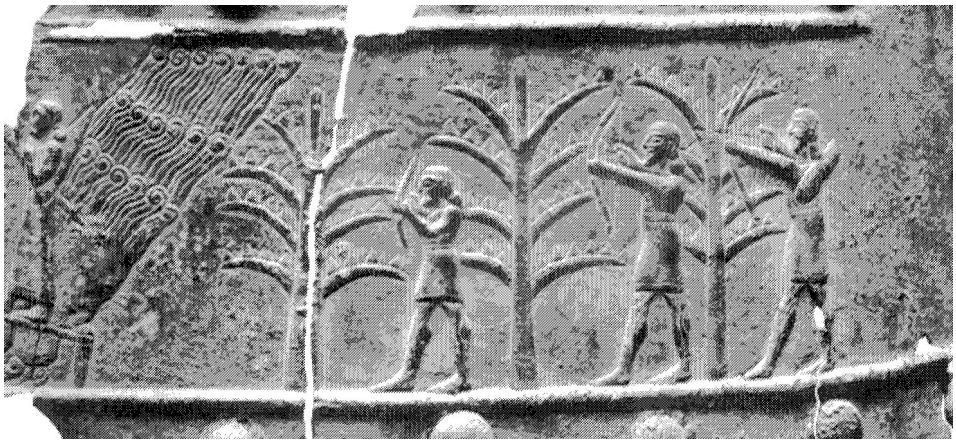
Unarmored chariotry and cavalry performing heroic overdraws, from the Balawat Gates of Shalmaneser III; after King 1915, pl. 72.

Plate 4

A

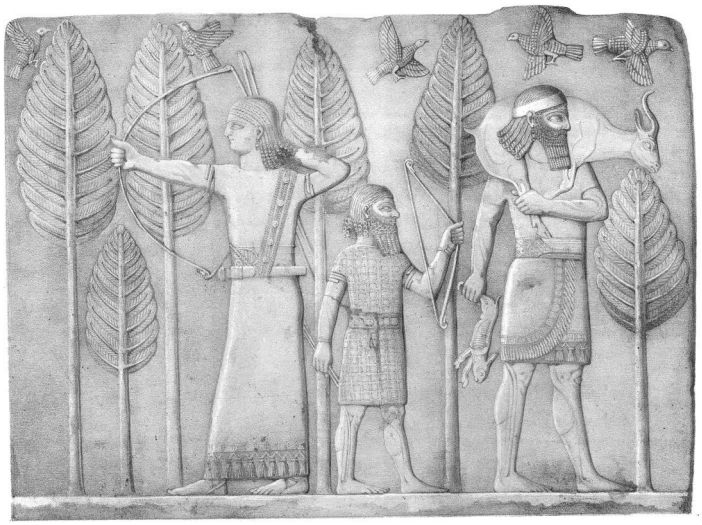
Lion hunt from the reliefs of Assurbanipal, with a dashed lion showing the trajectory of the arrow; after Barnett 1976, pl. 8.

B



Common Assyrians hunting, from the Balawat Gates of Shalmaneser III; after King 1915, pl. 65.

C



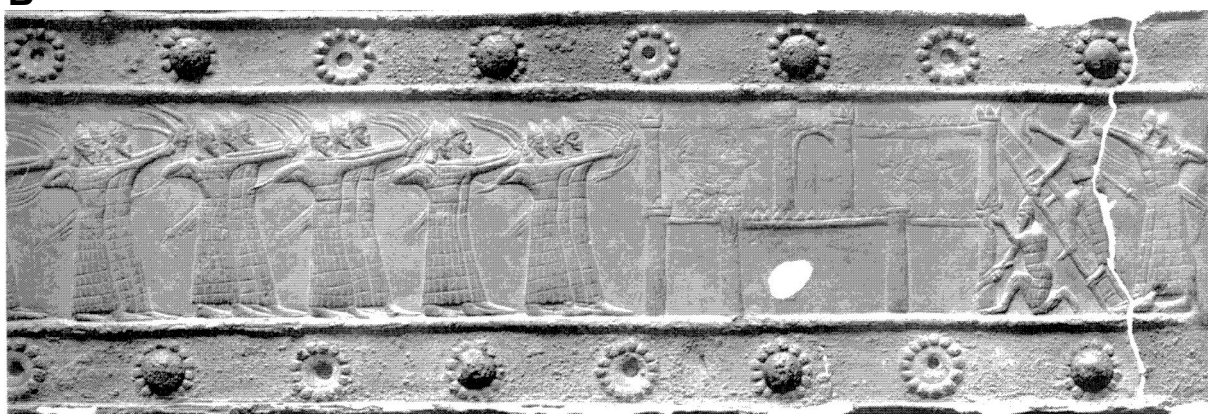
Individuals hunting various animals, from the reliefs of Sargon II at Khorsabad; after Layard 1853a, pl. 32.

Plate 5

A

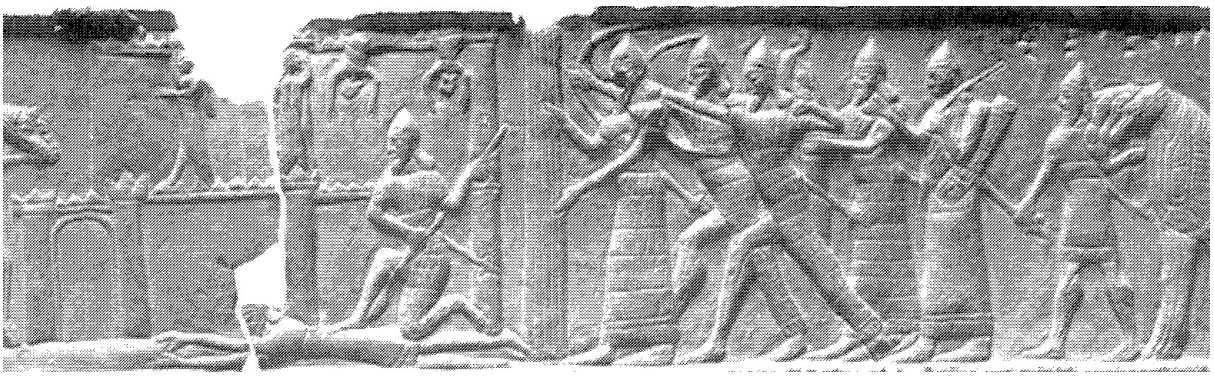
Multi-purpose cavalryman from the Balawat Gates of Shalmaneser III; after King 1915, pl. 15.

B



Archers lined up outside a city, firing at it, from the Balawat Gates of Shalmaneser III; after King 1915, pl. 21.

C



Armored Assyrian soldiers, including archers, storming a city, from the Balawat Gates of Shalmaneser III; after King 1915, pl. 73.

Plate 6

A

B

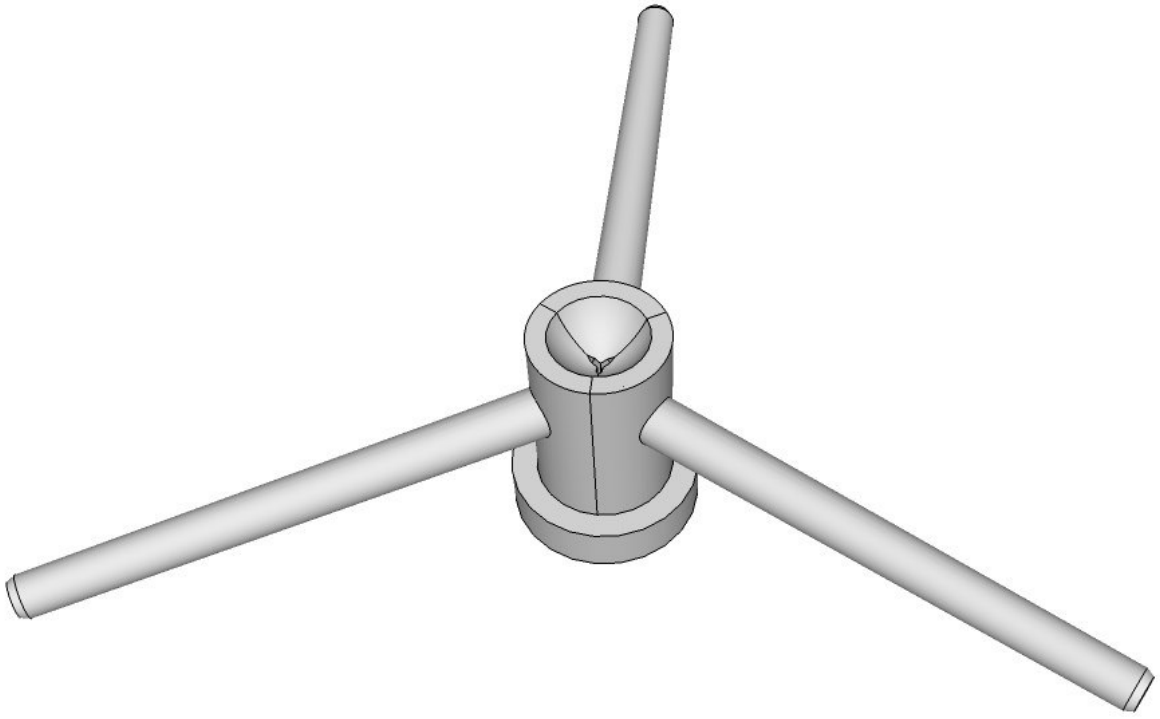
C

D

Carchemish mold, BM 116254A & B. Scale 1:1 A) 116254B, side view, B) 116254A, side view, C) 116254A interior face, D) 116254B interior face.

Plate 7

A



B

Carchemish mold, BM 116254A & B. Scale 1:1. A) 116254 A & B fitted together, B) 3D reconstruction of the Carchemish mold complete, assembled for casting.

Plate 8

A

B

C

D

Components of the “Mosul” mold, BM 124624. Scale 1:1. A) end pieces, B) support band, C) side pieces, D) base.

Plate 9

A

B

C

The "Mosul" mold, BM 124624. A) base, side view; note that the middle peg (for the bilobate's socket) is somewhat taller tan the other two, B) base, 3/4 view, C) base with one side and one end piece in place..

Plate 10

A

B

The "Mosul" mold, BM 124624. A) base with one side and both end pieces in place, B) the base and the test of the mold, assembled and inverted, showing the portion that would be inserted into the base.

Plate 11

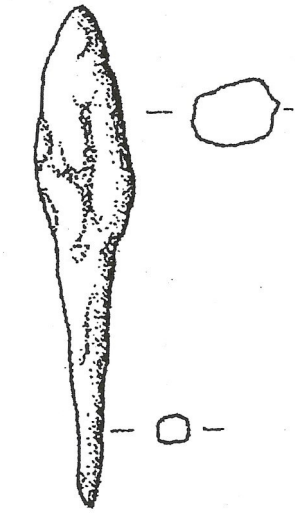
A

B

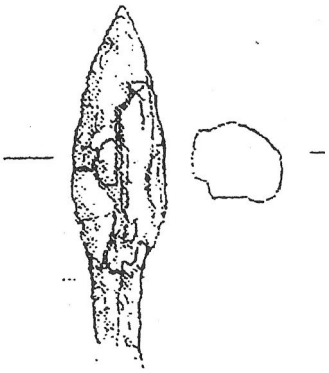
“Mosul” mold, BM 124624, assembled. A) top view (note the three pour gates), B) side view.

Plate 12

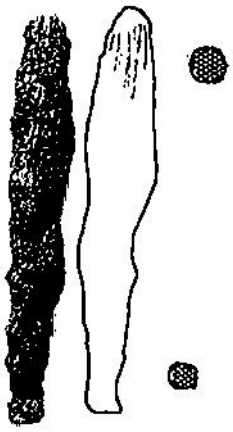
Type 1a-1



Ayanis 4

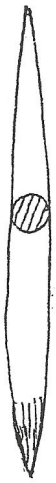


Ayanis 2



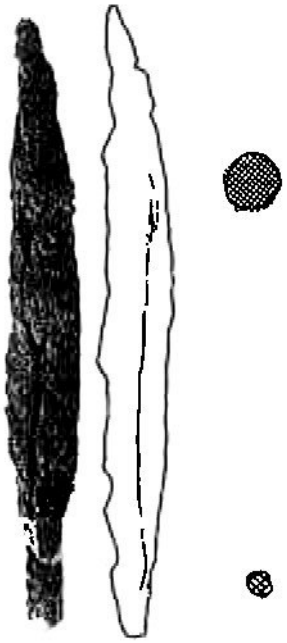
Lachish 181

Lachish 3



Gerar 87

Gerar 86



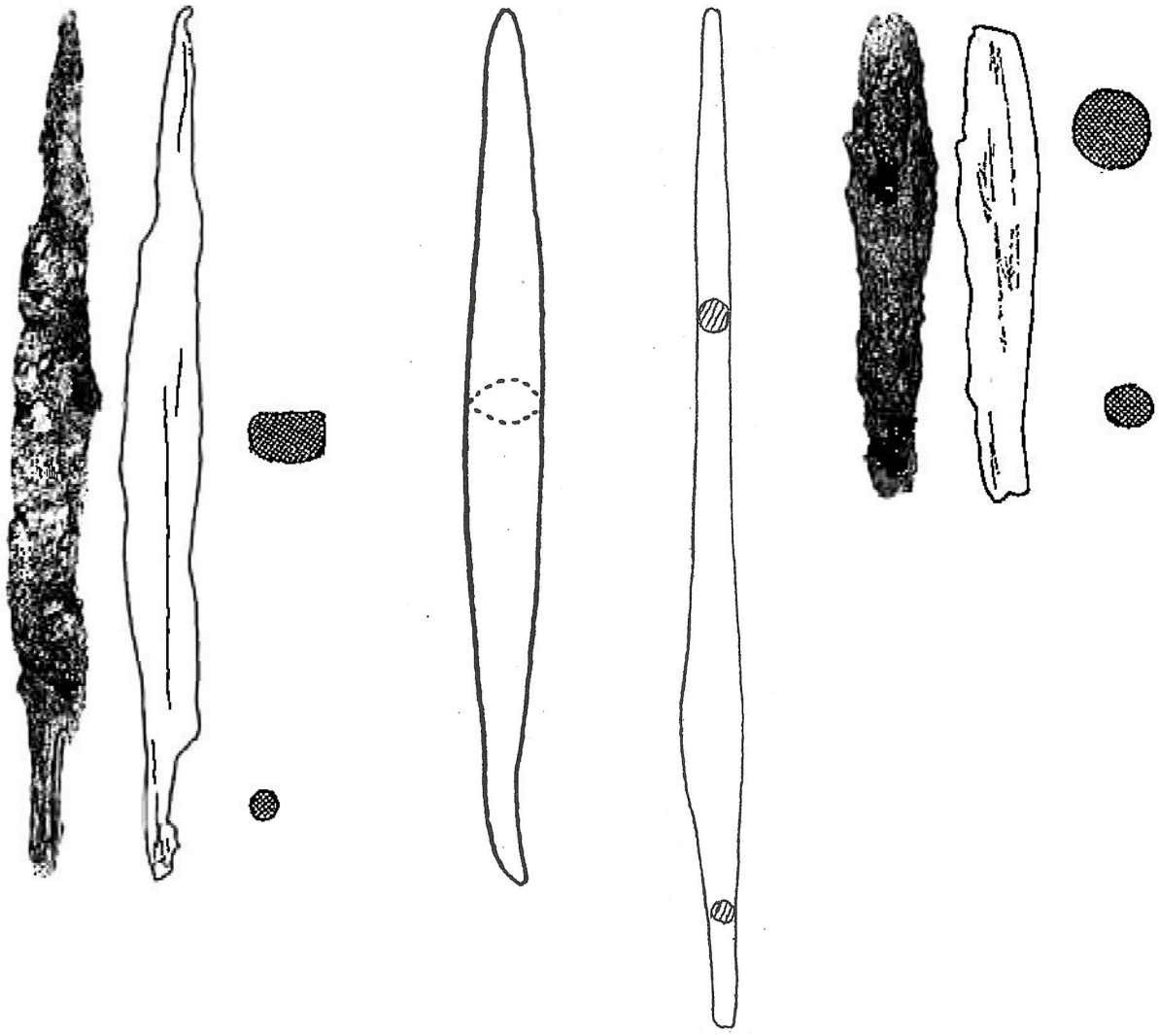
Lachish 180

Sources:

Site	No.	Type	Item No.	Source
Ayanis	4	1a-1	4	Derın & Muscarella 2001, fig. 2
Ayanis	2	1a-1	2	Derın & Muscarella 2001, fig. 2
Lachish	181	1a-1	61643	Gottlieb 2004, p. 1923, fig. 27.6:20
Lachish	3	1a-1	283	Tufnell et al 1953, p. 186, pl. 54:48
Gerar	87	1a-1	pl. 32:13	Petrie 1928, pl. 32:13
Gerar	86	1a-1	pl. 32:12	Petrie 1928, pl. 32:12
Lachish	180	1a-1	60711/60	Gottlieb 2004, p. 1923, fig. 27.6:19

Plate 13

Type 1a-1 (continued)



Lachish 62 **Lachish 20** **Gerar 91** **Lachish 137**

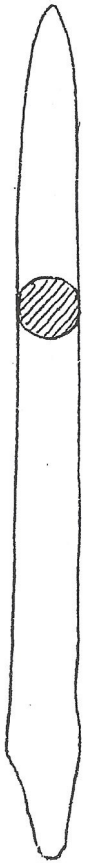
Sources:

Site	No.	Type	Item No.	Source
Lachish	62	1a-1	7063	Gottlieb 2004, p. 1943, fig. 27.16:1
Lachish	20	1a-1	5478	Gottlieb 2004, p. 1943, fig. 27.16:2
Gerar	91	1a-1	pl. 32:19	Petrie 1928, pl. 32:19
Lachish	137	1a-1	31608	Gottlieb 2004, p. 1919, fig. 27.4:14

Plate 14

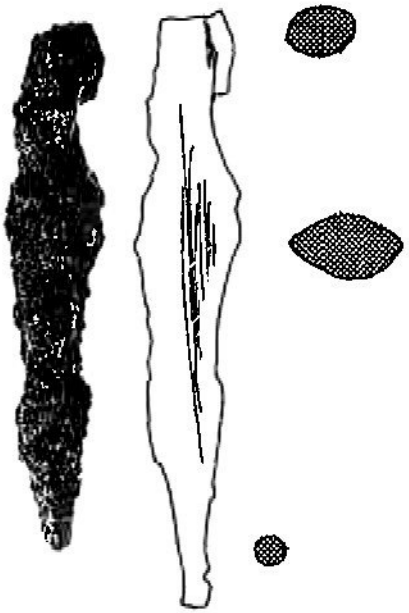
Type 1a-1 (continued)

Knedig 15



Gerar 92

Gerar 89



Lachish 136

Gerar 90

Sources:

Site	No.	Type	Item No.	Source
Tell Knedig	15	1a-1?	1162	Klengel-Brandt et al 2005, p. 309, pl. 201
Gerar	92	1a-1?	pl. 32:21	Petrie 1928, pl. 32:21
Gerar	89	1a-1?	pl. 32:17	Petrie 1928, pl. 32:17
Lachish	136	1a-1?	30567/60	Gottlieb 2004, p. 1919, fig. 27.4:13
Gerar	90	1a-1?	pl. 32:18	Petrie 1928, pl. 32:18

Plate 15

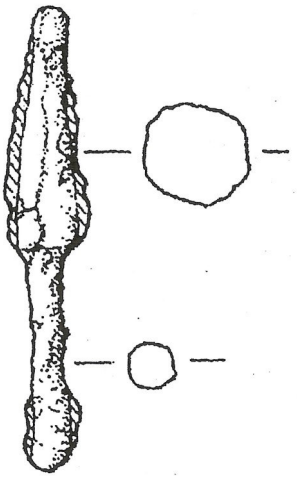
Type 1a-2

Sialk 66

Sialk 27

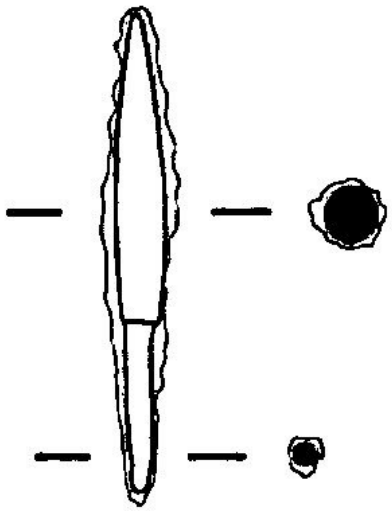
Sialk 25

Gerar 1

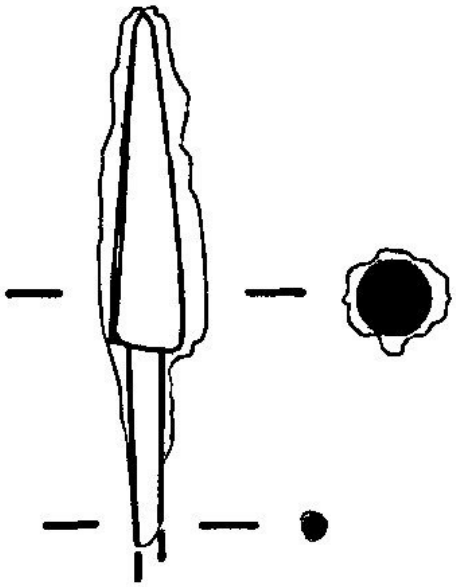


Ayanis 3

Sialk 26



Hasanlu 50

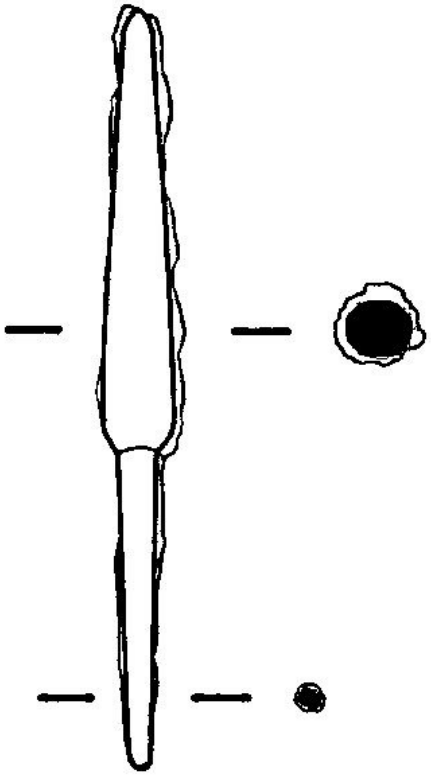


Hasanlu 49

Sources:

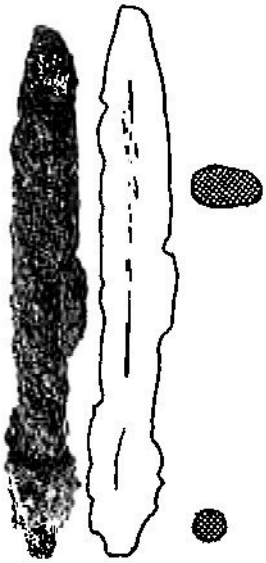
Site	No.	Type	Item No.	Source
Sialk	66	1a-2	pl. 92:10	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	27	1a-2	S 793b, e	Ghirshman 1939, vol. 2, p, 233, pl. 57
Sialk	25	1a-2	S 793b, c	Ghirshman 1939, vol. 2, p, 233, pl. 57
Gerar	1	1a-2	pl. 23:21	Petrie 1928, pl. 23:21
Ayanis	3	1a-2	3	Derın & Muscarella 2001, fig. 2
Sialk	26	1a-2	S 793b, d	Ghirshman 1939, vol. 2, p, 233, pl. 57
Hasanlu	50	1a-2	HAS 59-788 d	Thornton & Pigott 2011, p. 145, fig. 6.6:3
Hasanlu	49	1a-2	HAS 72-N274 a	Thornton & Pigott 2011, p. 145, fig. 6.6:2

Type 1a-2 (continued)



Hasanlu 48

Sialk 3



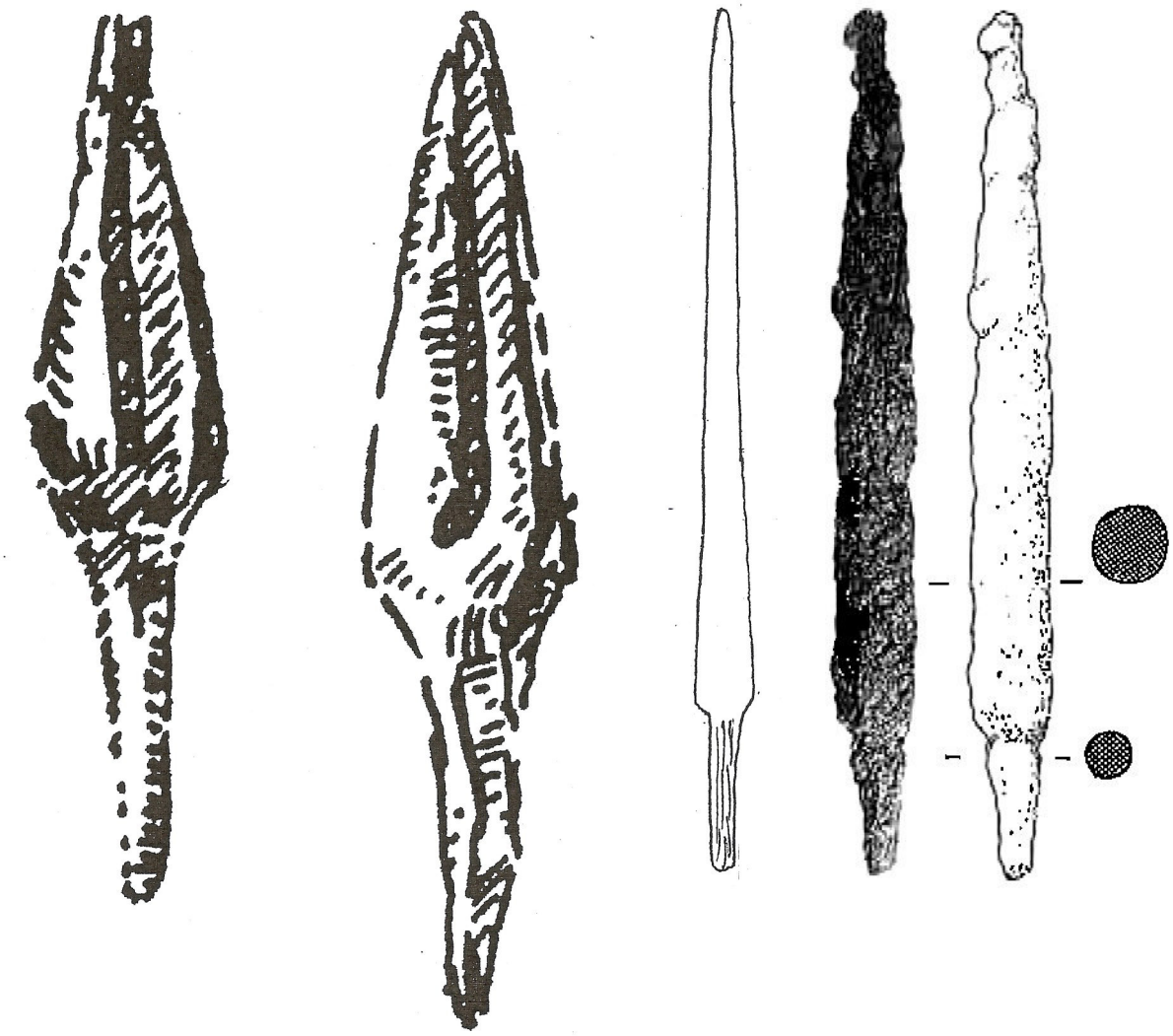
Lachish 179

Sources:

Site	No.	Type	Item No.	Source
Hasanlu	48	1a-2	HAS 74-N719	Thornton & Pigott 2011, p. 145, fig. 6.6:1
Sialk	3	1a-2	S 547b, c	Ghirshman 1939, vol. 2, p. 229; pl. 50
Lachish	179	1a-2	61753	Gottlieb 2004, p. 1923, fig. 27.6:18

Plate 17

Type 1a-2 (continued)

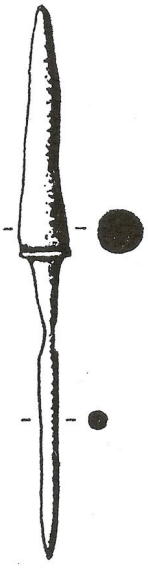


Sialk 2 Sialk 1 Gerar 88 Lachish 135

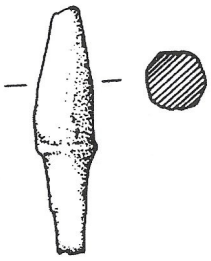
Sources:

Site	No.	Type	Item No.	Source
Sialk	2	1a-2	S 547b, b	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	1	1a-2	S 547b, a	Ghirshman 1939, vol. 2, p. 229; pl. 50
Gerar	88	1a-2	pl. 32:15	Petrie 1928, pl. 32:15
Lachish	135	1a-2	39205/60	Gottlieb 2004, p. 1919, fig. 27.4:12

Type 1a-3

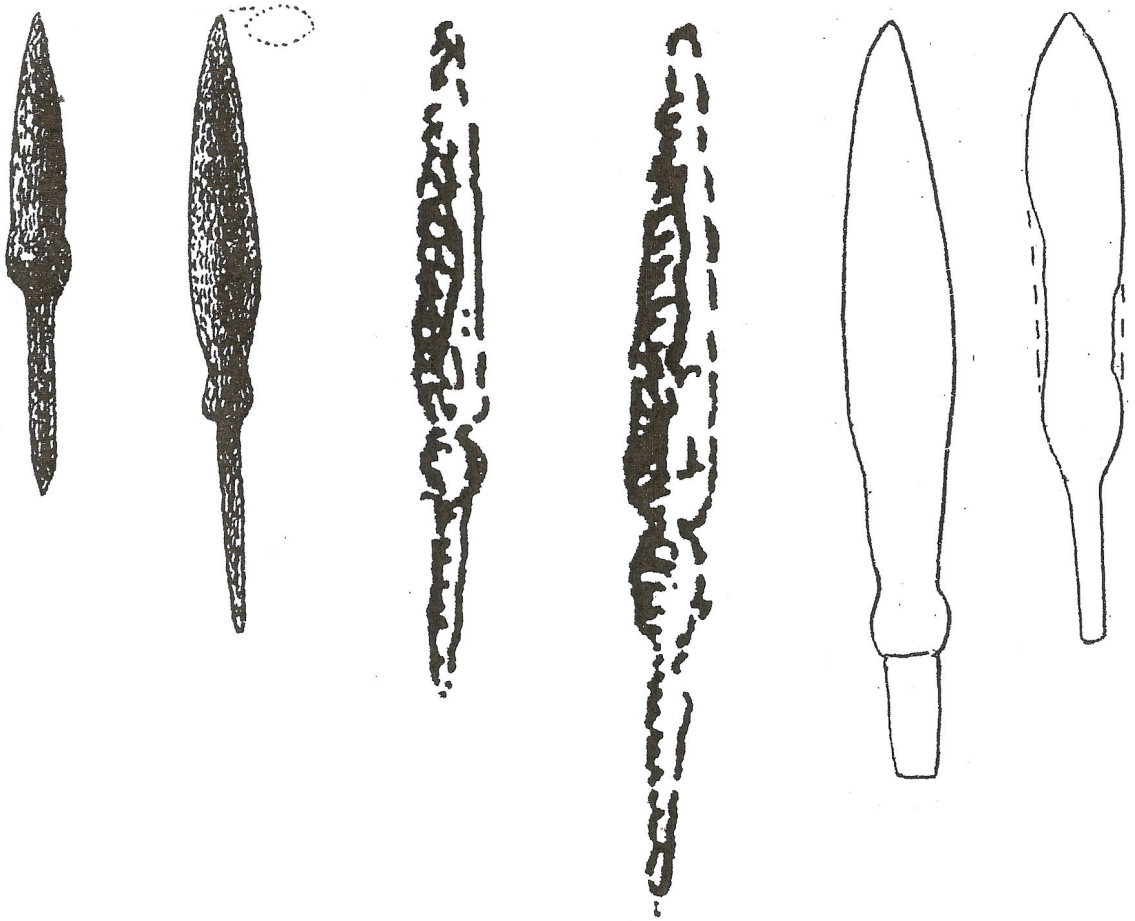


Toprakkale 21



Nush-i Jan 6

Type 1a-4

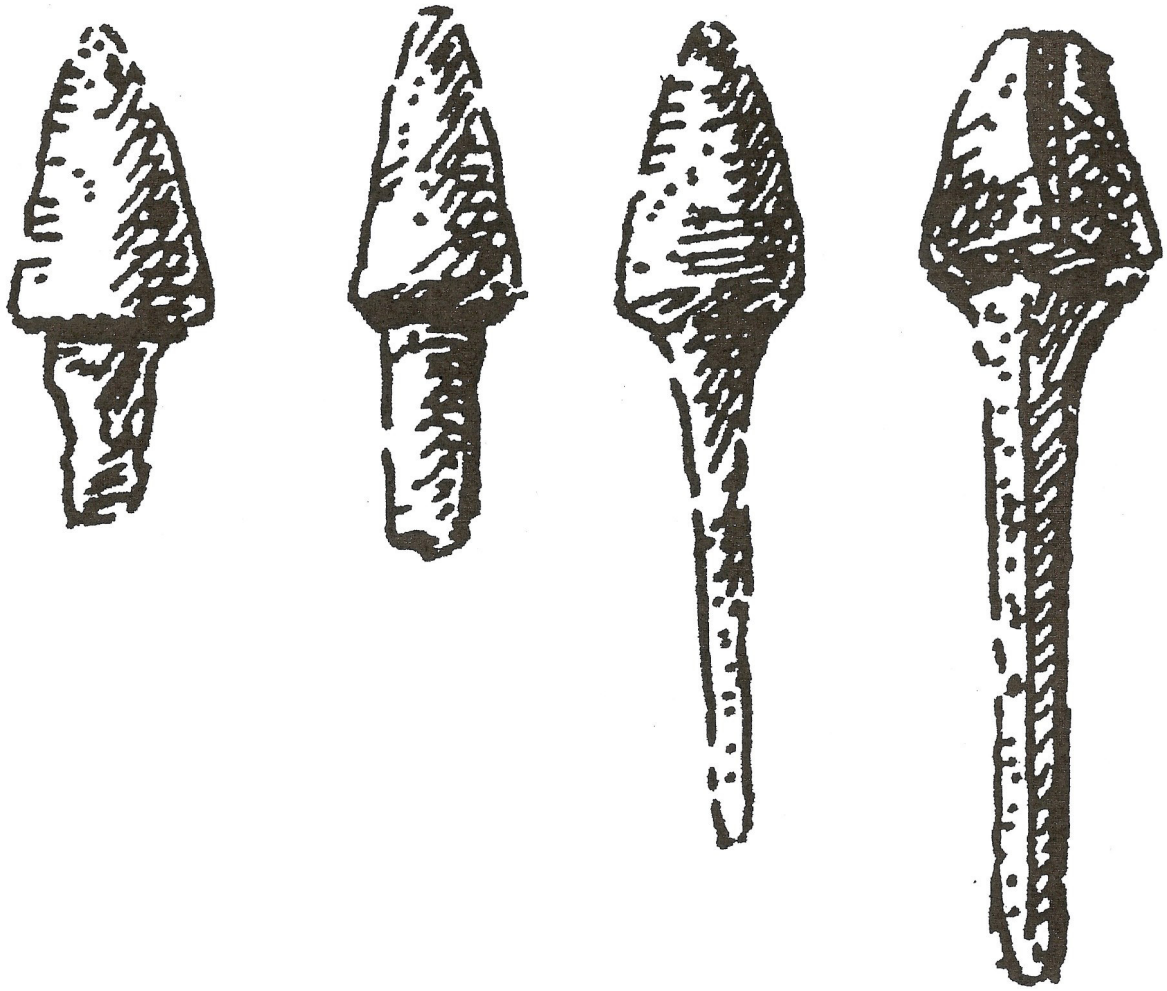


Sialk 67 Sialk 68 Sialk 52 Sialk 51 Gerar 78 Gerar 79

Sources: see Plate 19

Plate 19

Type 1a-7



Sialk 6 Sialk 5 Sialk 4 Sialk 7

Sources for Plate 18:

Site	No.	Type	Item No.	Source
Toprakkale	21	1a-3	350	Wartke 1990, p. 127, fig. 32o; pl. 39:b.9
Nush-i Jan	6	1a-3	NU 67/176	Curtis 1984, p. 26, fig 6:253
Sialk	67	1a-4	pl. 92:11	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	68	1a-4	pl. 92:12	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	52	1a-4	S 973a, b	Ghirshman 1939, vol. 2, p. 244, pl. 77
Sialk	51	1a-4	S 973a, a	Ghirshman 1939, vol. 2, p. 244, pl. 77
Gerar	78	1a-4	pl. 29:63	Petrie 1928, pl. 29:63
Gerar	79	1a-4?	pl. 29:64	Petrie 1928, pl. 29:64

Sources for Plate 19:

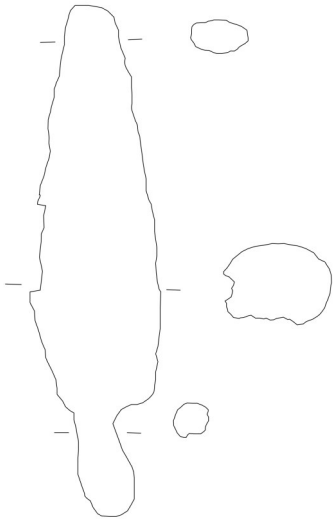
Sialk	6	1a-7	S 547b, f	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	5	1a-7	S 547b, e	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	4	1a-7	S 547b, d	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	7	1a-7?	S 547b, g	Ghirshman 1939, vol. 2, p. 229; pl. 50

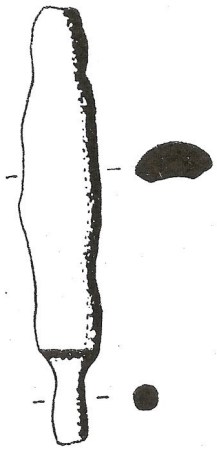
Plate 20

Type 1a-8

Gerar 69

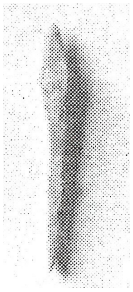
Nimrud 263





Toprakkale 16

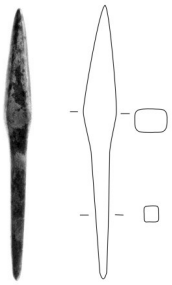
Type 1c-1



Assur 50

Uruk 12

Assur 51



Assur 4

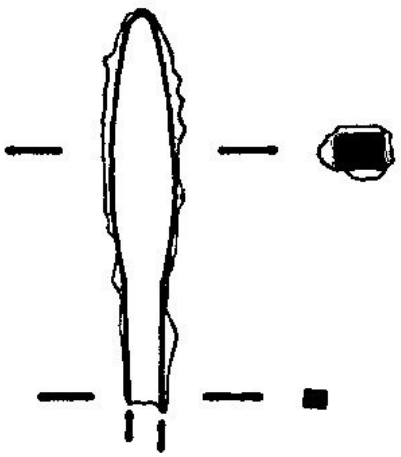
Gerar 12

Sources:

Site	No.	Type	Item No.	Source
Gerar	69	1a-8	pl. 29:54	Petrie 1928, pl. 29:54
Nimrud	263	1a-8	ND 3362	British Museum
Toprakkale	16	1a-8?	336	Wartke 1990, p. 127, fig. 32k
Assur	50	1c-1	8264	Vorderasiatisches Museum Berlin
Uruk	12	1c-1	W 19465	van Ess & Pedde 1992, p. 37, no. 352
Assur	51	1c-1	8190	Vorderasiatisches Museum Berlin
Assur	4	1c-1	14289f	Vorderasiatisches Museum Berlin
Gerar	12	1c-1	pl. 28:17	Petrie 1928, pl. 28:17

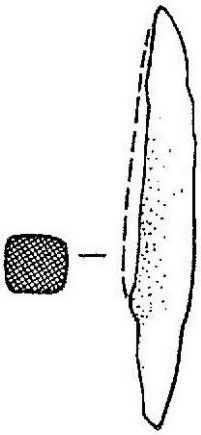
Plate 21

Type 1c-1 (continued)



Hasanlu 51

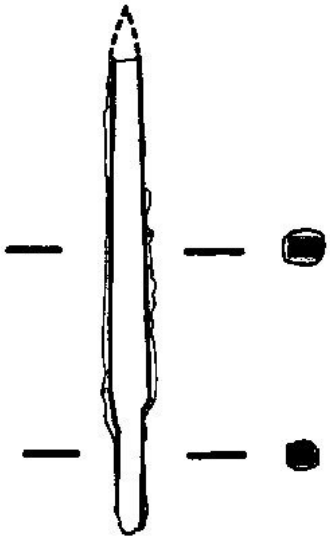
Gerar 8



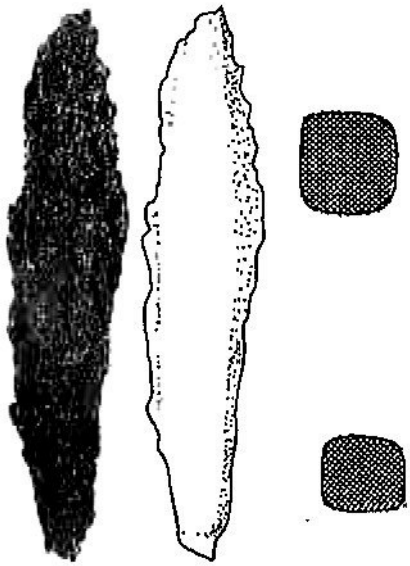
Lachish 73

Gerar 11

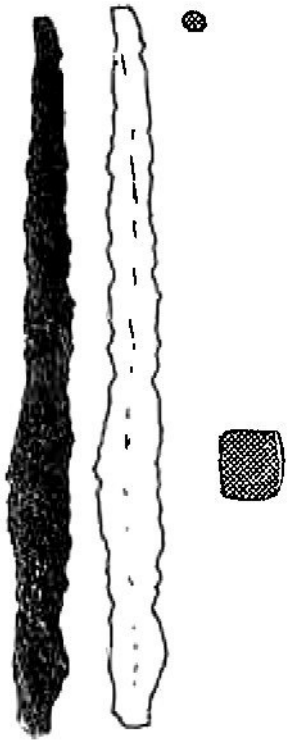
Lachish 36



Hasanlu 68



Lachish 138



Lachish 140

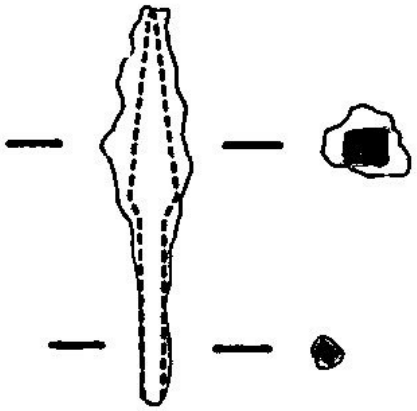
Sources:

Site	No.	Type	Item No.	Source
Hasanlu	51	1c-1	HAS 74-N677b	Thornton & Pigott 2011, p. 145, fig. 6.6:4
Gerar	8	1c-1	pl. 28:13	Petrie 1928, pl. 28:13
Lachish	73	1c-1	135/6B	Rothenberg 1975, p. 75, pl. 36:9
Gerar	11	1c-1	pl. 28:16	Petrie 1928, pl. 28:16
Lachish	36	1c-1	6829	Gottlieb 2004, p. 1943, fig. 27.16:6
Hasanlu	68	1c-1	HAS 64-585	Thornton & Pigott 2011, p. 145, fig. 6.6:21
Lachish	138	1c-1	8847/60	Gottlieb 2004, p. 1919, fig. 27.4:15
Lachish	140	1c-1	10279/60	Gottlieb 2004, p. 1919, fig. 27.4:17

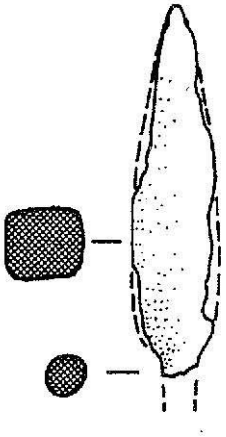
Plate 22

Type 1c-1 (continued)

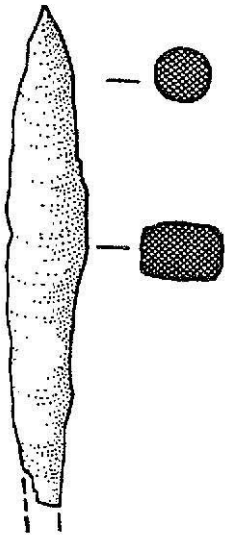
Uruk 23



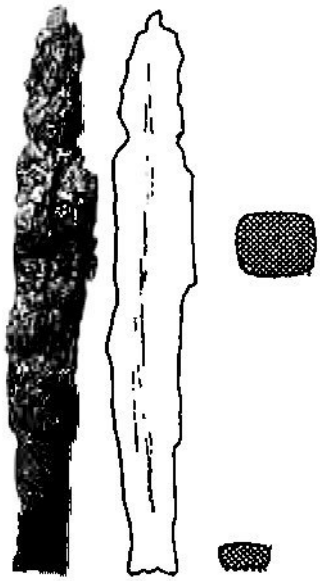
Hasanlu 52



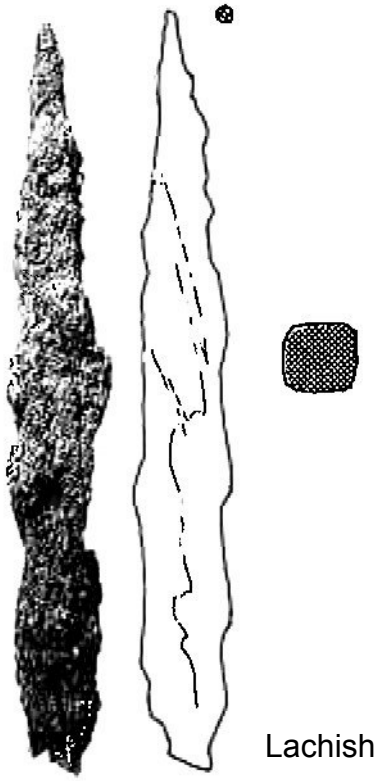
Lachish 75



Lachish 74



Lachish 178

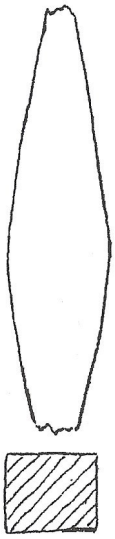


Lachish 177

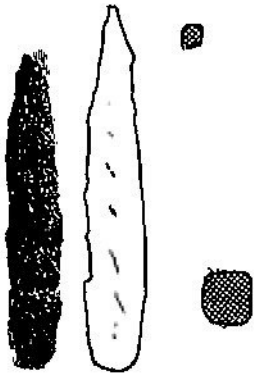
Sources:

Site	No.	Type	Item No.	Source
Uruk	23	1c-1?	W 2212	Pedde 2000, p. 42, no. 666
Hasanlu	52	1c-1?	UPM 57-71	Thornton & Pigott 2011, p. 145, fig. 6.6:5
Lachish	75	1c-1?	104/63	Rothenberg 1975, p. 75, pl. 36:11
Lachish	74	1c-1?	135/61A	Rothenberg 1975, p. 75, pl. 36:10
Lachish	178	1c-1?	60547/60	Gottlieb 2004, p. 1923, fig. 27.6:17
Lachish	177	1c-1?	61194/60	Gottlieb 2004, p. 1923, fig. 27.6:16

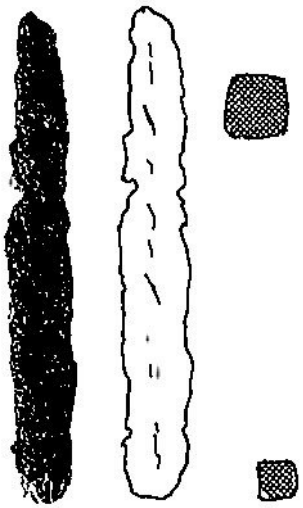
Type 1c-1 (continued)



Gerar 14

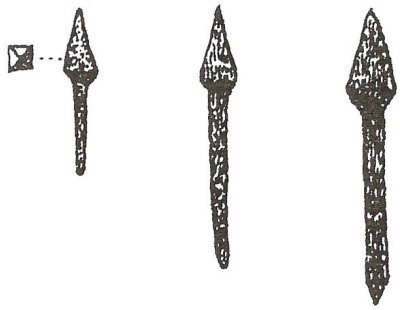


Lachish 142

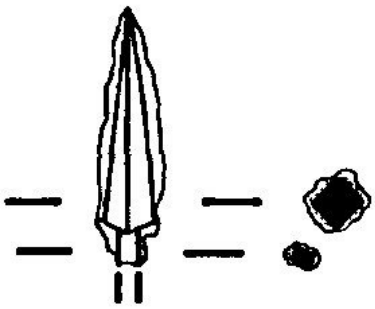


Lachish 141

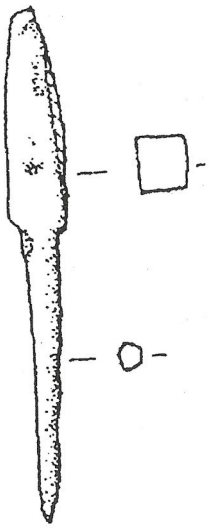
Type 1c-2



Sialk 63 Sialk 64 Sialk 65



Hasanlu 53

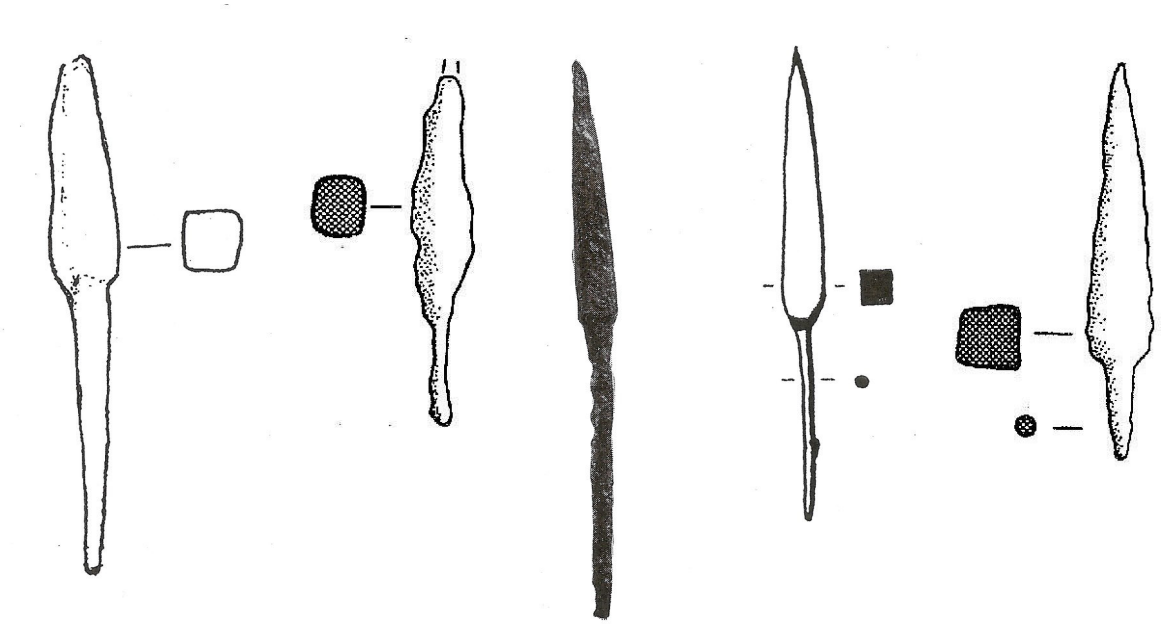


Ayanis 1

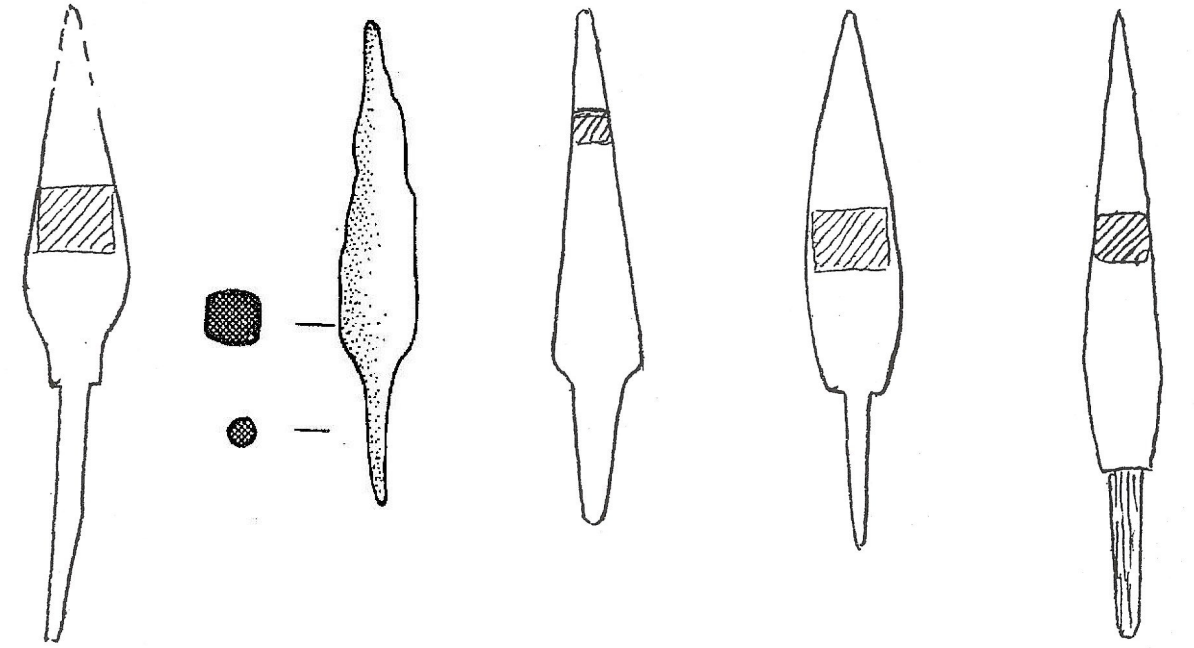
Sources:

Site	No.	Type	Item No.	Source
Gerar	14	1c-1?	pl. 28:19	Petrie 1928, pl. 28:19
Lachish	142	1c-1?	10289/60	Gottlieb 2004, p. 1919, fig. 27.4:20
Lachish	141	1c-1?	10202/60	Gottlieb 2004, p. 1919, fig. 27.4:19
Sialk	63	1c-2	pl. 92:7	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	64	1c-2	pl. 92:8	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	65	1c-2	pl. 92:9	Ghirshman 1939, vol. 2, p. 248, pl. 92
Hasanlu	53	1c-2	HAS 72-N73b	Thornton & Pigott 2011, p. 145, fig. 6.6:6
Ayanis	1	1c-2	1	Derın & Muscarella 2001, fig. 2

Type 1c-2 (continued)



Ayanis 108 Lachish 78 Toprakkale 19 Toprakkale 20 Lachish 76

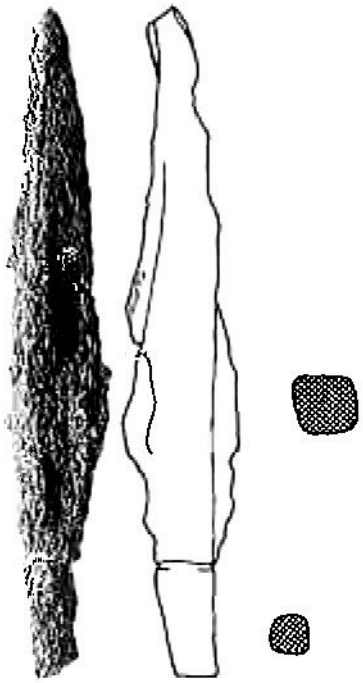


Gerar 15 Lachish 77 Gerar 10 Gerar 13 Gerar 9

Sources: see Plate 25

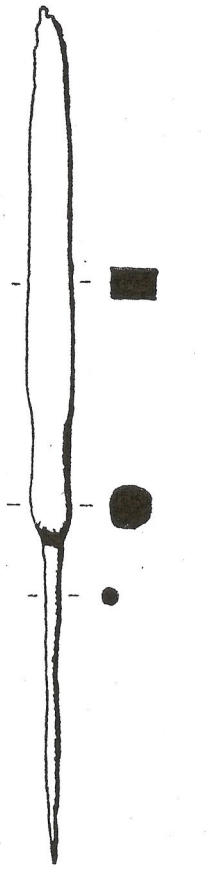
Plate 25

Type 1c-2 (continued)



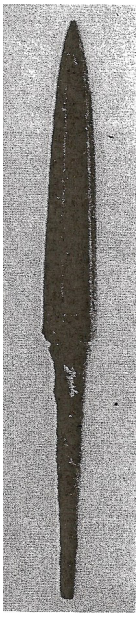
Lachish 139

Type 1c-5



Toprakkale 18

Type 1c-6



Marlik 4

Sources for Plate 24:

Site	No.	Type	Item No.	Source
Ayanis	108	1c-2	108	Derın & Muscarella 2001, fig. 7
Lachish	78	1c-2	97/61	Rothenberg 1975, p. 76, pl. 36:14
Toprakkale	19	1c-2	343	Wartke 1990, pl. 39:b.8
Toprakkale	20	1c-2	344	Wartke 1990, p. 127, fig. 32n
Lachish	76	1c-2	104/61	Rothenberg 1975, p. 75, pl. 36:12
Gerar	15	1c-2	pl. 28:20	Petrie 1928, pl. 28:20
Lachish	77	1c-2	104/62	Rothenberg 1975, p. 75, pl. 29:4 & 36:13
Gerar	10	1c-2	pl. 28:15	Petrie 1928, pl. 28:15
Gerar	13	1c-2	pl. 28:18	Petrie 1928, pl. 28:18
Gerar	9	1c-2	pl. 28:14	Petrie 1928, pl. 28:14

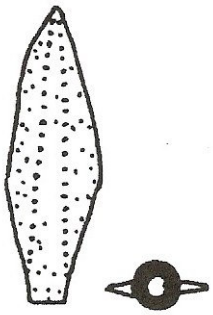
Sources for Plate 25:

Lachish	139	1c-2	11155/60	Gottlieb 2004, p. 1919, fig. 27.4:16
Toprakkale	18	1c-5	338	Wartke 1990, p. 127, fig. 32m; pl. 39:b.7
Marlik	4	1c-6	41b M	Negahban 1996, p. 277, pl. 126:827

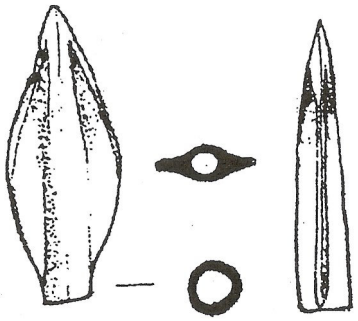
Plate 26

Type 2-1

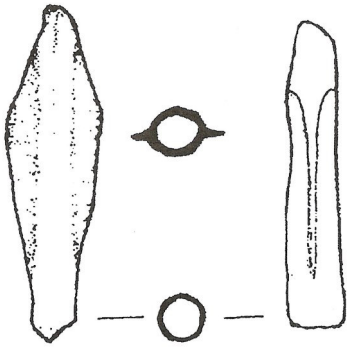
Uruk 16



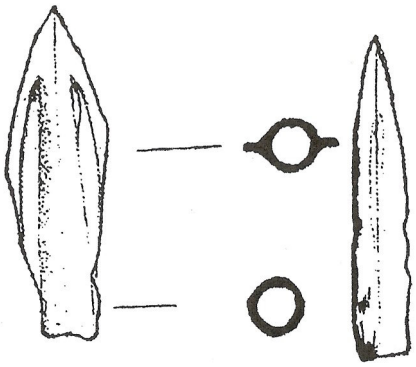
Bastam 22



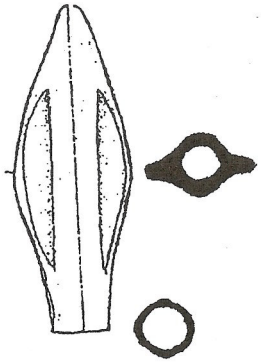
Ayanis 106



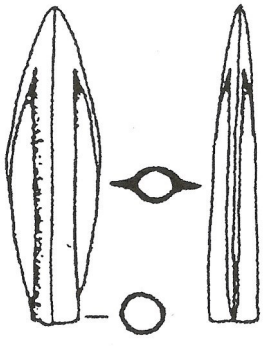
Ayanis 99



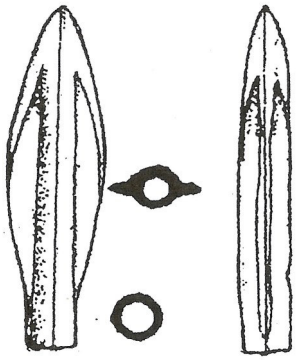
Ayanis 98



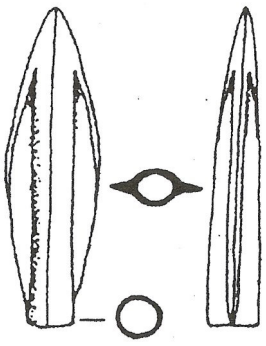
Ayanis 100



Ayanis 92



Ayanis 93



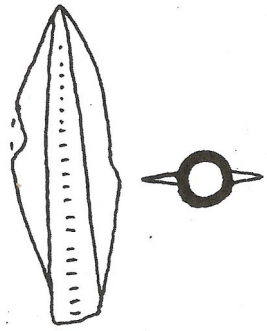
Ayanis 102

Sources:

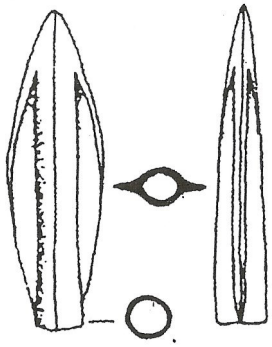
Site	No.	Type	Item No.	Source
Uruk	16	2-1	W 19241	van Ess & Pedde 1992, p. 37, no. 356
Bastam	22	2-1	77/1	Kroll 1988, p. 160, Abb. 3:4, Taf. 37:5
Ayanis	106	2-1	106	Derın & Muscarella 2001, fig. 7
Ayanis	99	2-1	99	Derın & Muscarella 2001, fig. 7
Ayanis	98	2-1	98	Derın & Muscarella 2001, fig. 7
Ayanis	100	2-1	100	Derın & Muscarella 2001, fig. 7
Ayanis	92	2-1	92	Derın & Muscarella 2001, fig. 7
Ayanis	93	2-1	93	Derın & Muscarella 2001, fig. 7
Ayanis	102	2-1	102	Derın & Muscarella 2001, fig. 7

Plate 27

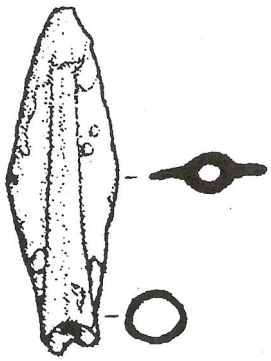
Type 2-1 (continued)



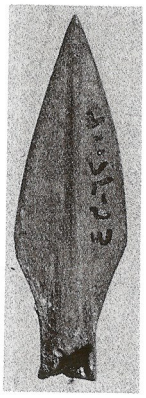
Bastam 16

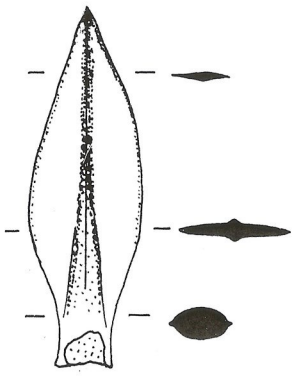


Ayanis 91

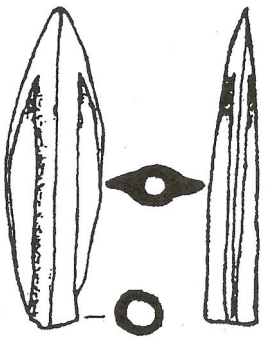


Ayanis 94

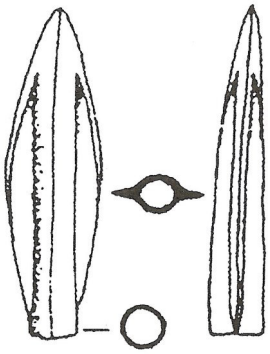




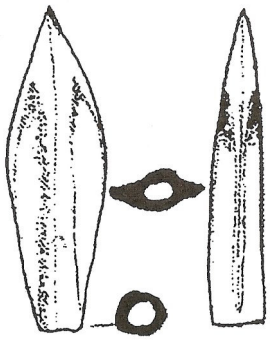
Uruk 17



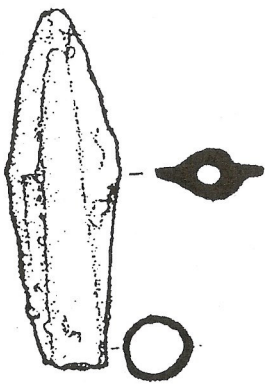
Ayanis 103



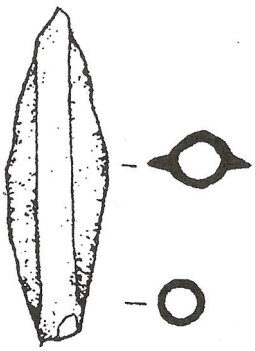
Ayanis 96



Ayanis 101



Ayanis 95



Ayanis 97

Gerar 26

Sources:

Site	No.	Type	Item No.	Source
Bastam	16	2-1	75/53	Kroll 1979, p. 166; Abb 16:31
Ayanis	91	2-1	91	Derın & Muscarella 2001, fig. 7
Ayanis	94	2-1	94	Derın & Muscarella 2001, fig. 7
Uruk	17	2-1	W 19247	van Ess & Pedde 1992, p. 37, no. 357
Ayanis	103	2-1	103	Derın & Muscarella 2001, fig. 7
Ayanis	96	2-1	96	Derın & Muscarella 2001, fig. 7
Ayanis	101	2-1	101	Derın & Muscarella 2001, fig. 7
Ayanis	95	2-1	95	Derın & Muscarella 2001, fig. 7
Ayanis	97	2-1	97	Derın & Muscarella 2001, fig. 7
Gerar	26	2-1?	pl. 29:11	Petrie 1928, pl. 29:11

Plate 28

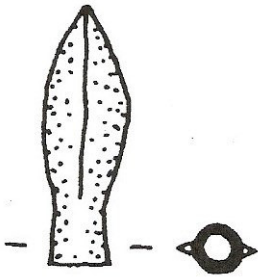
Type 2-2

Gerar 5

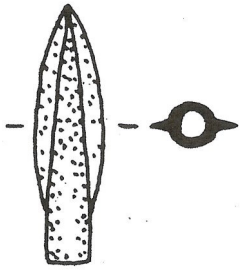
Assur 11

Assur 9

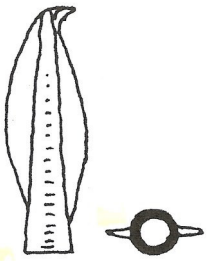
Assur 38



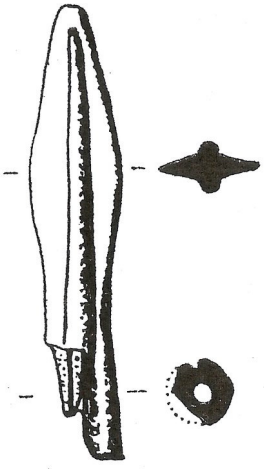
Bastam 23



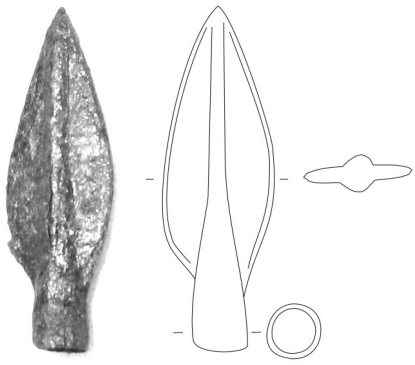
Bastam 8



Bastam 3



Toprakkale 15

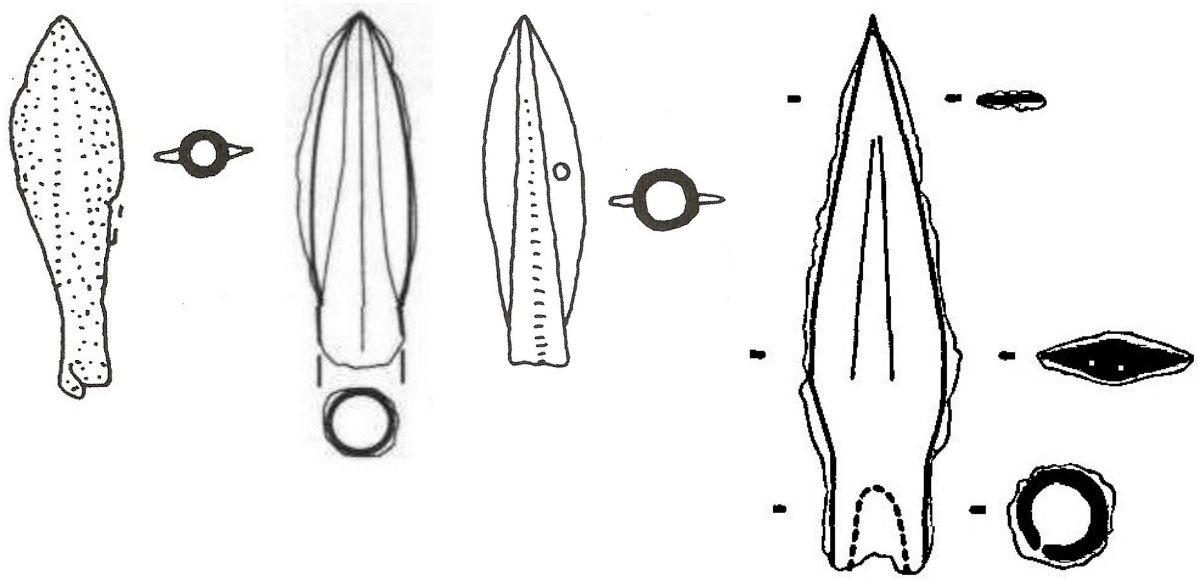


Carchemish 15

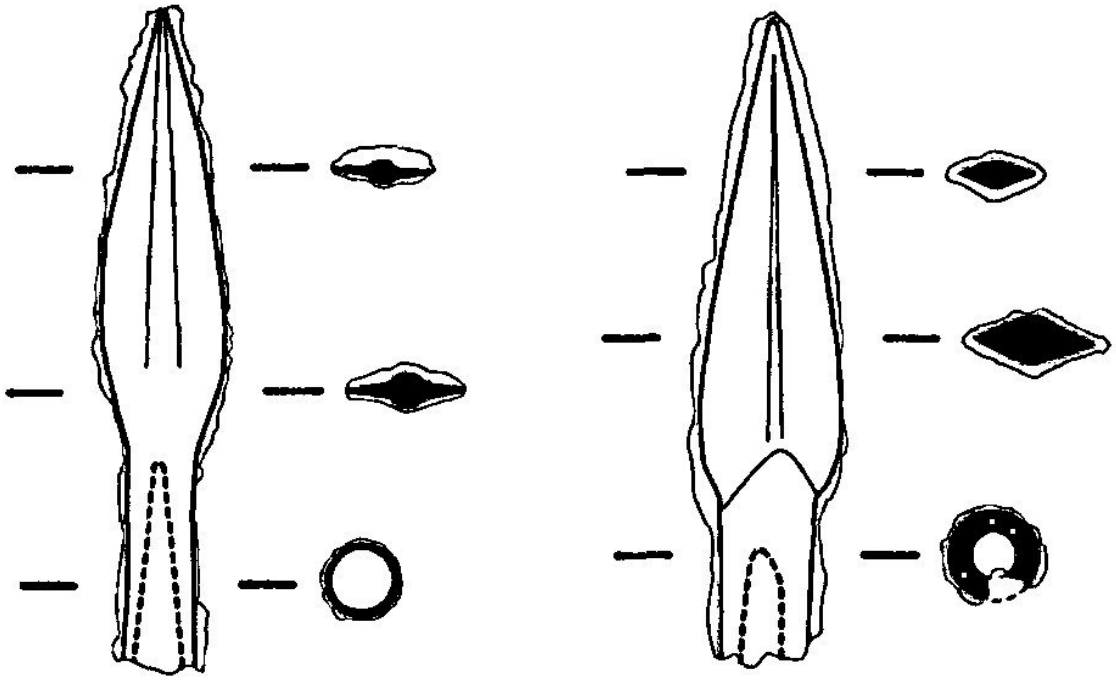
Sources:

Site	No.	Type	Item No.	Source
Gerar	5	2-2	pl. 23:30	Petrie 1928, pl. 23:30
Assur	11	2-2	8472b	Vorderasiatisches Museum Berlin
Assur	9	2-2	9066	Vorderasiatisches Museum Berlin
Assur	38	2-2	18180	Vorderasiatisches Museum Berlin
Bastam	23	2-2	78/1295	Kroll 1988, p. 160, Abb. 3:3
Bastam	8	2-2	72/39	Kroll 1979, p. 162; Abb 10:8
Bastam	3	2-2	75/175	Kroll 1979, p. 158, Abb 3:2
Toprakkale	15	2-2!	335	Wartke 1990, p. 127, fig. 32i
Carchemish	15	2-2	116194	British Museum; 1922-5-11.327

Type 2-2 (continued)



Bastam 18 Hasanlu 92 Bastam 14 Hasanlu 38

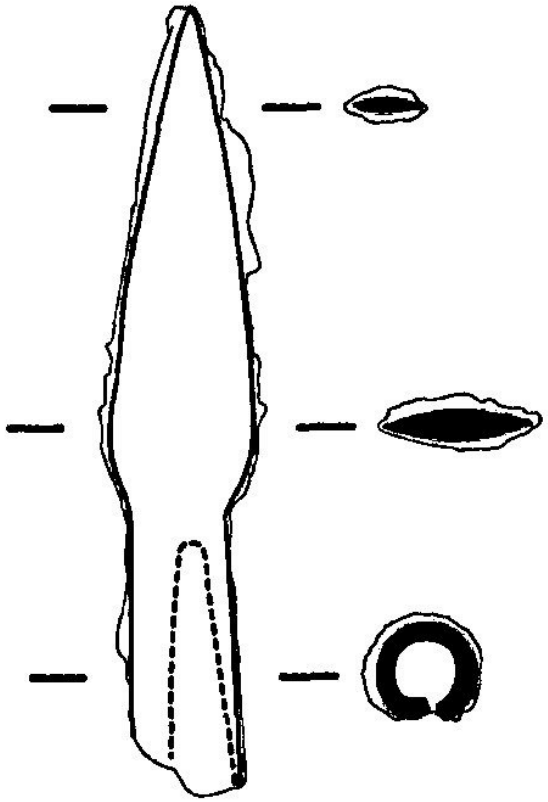


Hasanlu 39 Hasanlu 37

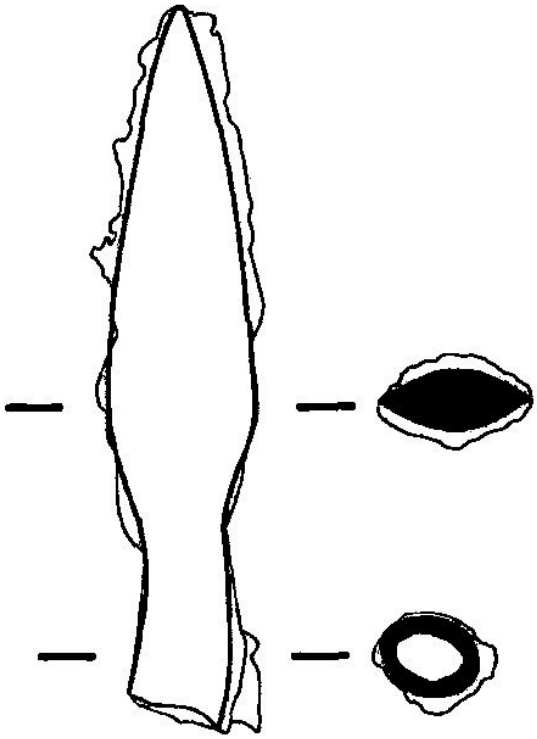
Sources:

Site	No.	Type	Item No.	Source
Bastam	18	2-2	78/1248	Kroll 1988, p. 157, Abb. 2:3
Hasanlu	92	2-2	HAS 62-25	Thornton & Pigott 2011, p. 168, fig. 6.31:8
Bastam	14	2-2	75/60	Kroll 1979, p. 166; Abb 16:30
Hasanlu	38	2-2!	HAS 72-N444 a	Thornton & Pigott 2011, p. 143, fig. 6.4:4
Hasanlu	39	2-2	HAS 62-1043 b	Thornton & Pigott 2011, p. 143, fig. 6.4:5
Hasanlu	37	2-2!	HAS 72-N114 b	Thornton & Pigott 2011, p. 143, fig. 6.4:3

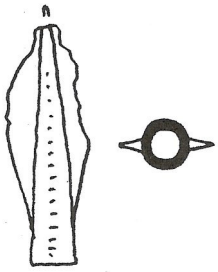
Type 2-2 (continued)



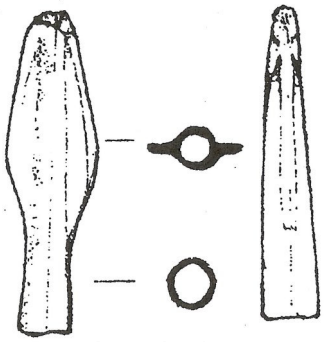
Hasanlu 36



Hasanlu 35



Bastam 15

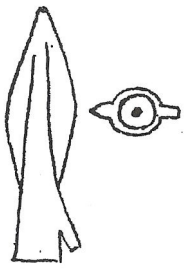


Ayanis 104

Type 2-3

Assur 47

Assur 29



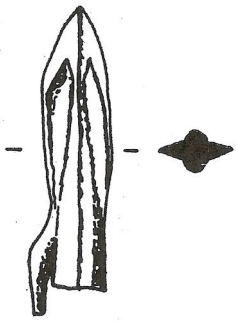
Gerar 25

Gerar 20

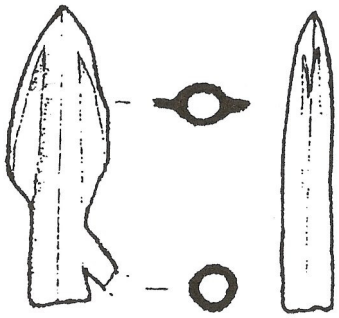
Sources: see Plate 31

Plate 31

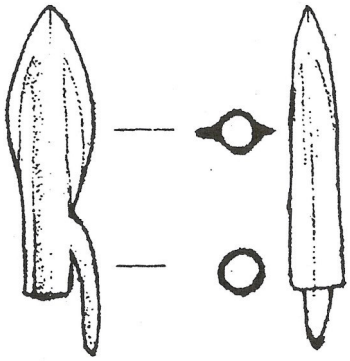
Type 2-3 (continued)



Toprakkale 3

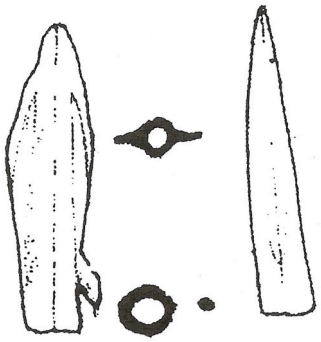


Ayanis 83



Ayanis 81

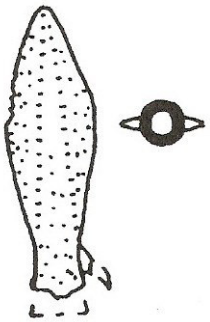
Carchemish 8



Ayanis 82

Carchemish 5

Assur 30



Bastam 19

Sources for Plate 30:

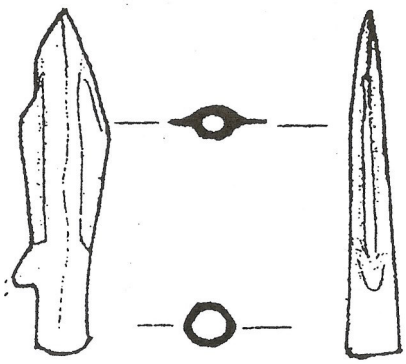
Site	No.	Type	Item No.	Source
Hasanlu	36	2-2!	HAS 72-N236 b	Thornton & Pigott 2011, p. 143, fig. 6.4:2
Hasanlu	35	2-2!	HAS 72-N294 a	Thornton & Pigott 2011, p. 143, fig. 6.4:1
Bastam	15	2-2	75/158	Kroll 1979, p. 166; Abb 16:32
Ayanis	104	2-2	104	Derın & Muscarella 2001, fig. 7
Assur	47	2-3	13318	Vorderasiatisches Museum Berlin
Assur	29	2-3	11558	Vorderasiatisches Museum Berlin
Gerar	25	2-3	pl. 29:10	Petrie 1928, pl. 29:10
Gerar	20	2-3	pl. 29:05	Petrie 1928, pl. 29:05

Sources for Plate 31:

Toprakkale	3	2-3	35	Wartke 1990, p. 61, fig. 9b; pl. 14:a.3
Ayanis	83	2-3	83	Derın & Muscarella 2001, fig. 6
Ayanis	81	2-3	81	Derın & Muscarella 2001, fig. 6
Carchemish	8	2-3	116197	1922-5-11.330
Ayanis	82	2-3	82	Derın & Muscarella 2001, fig. 6
Carchemish	5	2-3	116198	British Museum, 1922-5-11.331
Assur	30	2-3	11631	Vorderasiatisches Museum Berlin
Bastam	19	2-3	78/1260	Kroll 1988, p. 157, Abb. 2:4

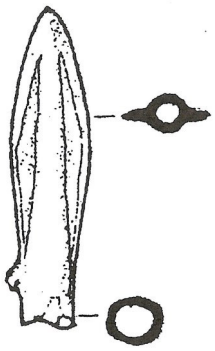
Plate 32

Type 2-3 (continued)



Ayanis 85

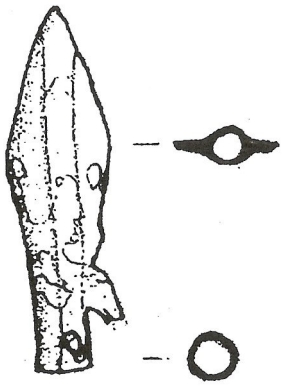
Gerar 18



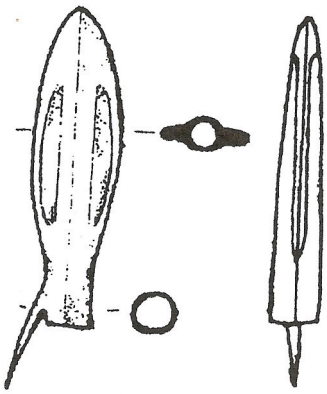
Ayanis 86

Gerar 19

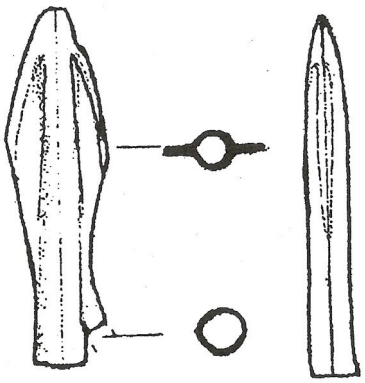
Gerar 17



Ayanis 80



Ayanis 84



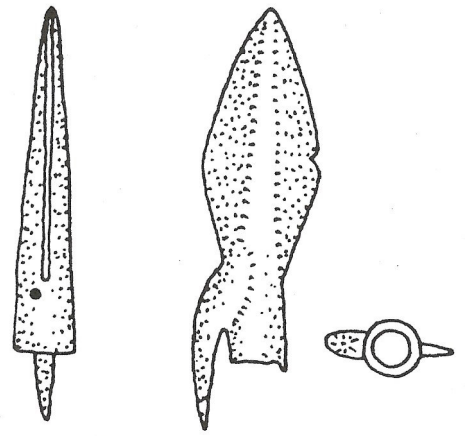
Ayanis 79

Sources:

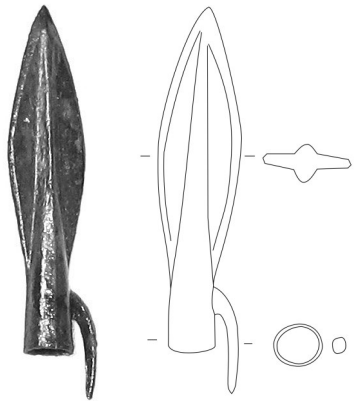
Site	No.	Type	Item No.	Source
Ayanis	85	2-3	85	Derın & Muscarella 2001, fig. 6
Gerar	18	2-3	pl. 29:03	Petrie 1928, pl. 29:03
Ayanis	86	2-3	86	Derın & Muscarella 2001, fig. 6
Gerar	19	2-3	pl. 29:04	Petrie 1928, pl. 29:04
Gerar	17	2-3	pl. 29:02	Petrie 1928, pl. 29:02
Ayanis	80	2-3	80	Derın & Muscarella 2001, fig. 6
Ayanis	84	2-3	84	Derın & Muscarella 2001, fig. 6
Ayanis	79	2-3	79	Derın & Muscarella 2001, fig. 6

Plate 33

Type 2-3 (continued)

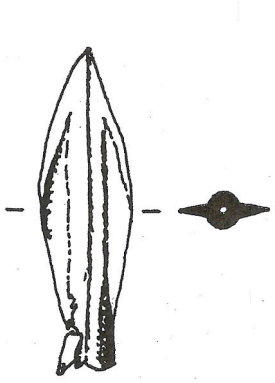


Bastam 2

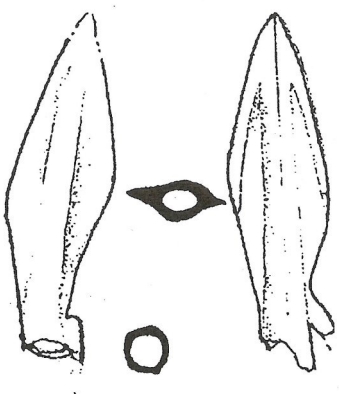


Carchemish 3

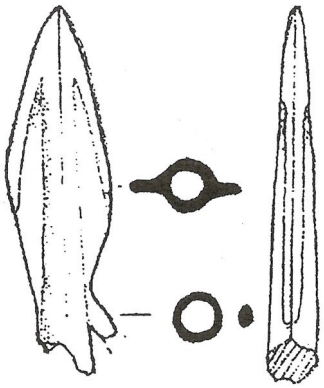
Carchemish 4



Toprakkale 4



Ayanis 75



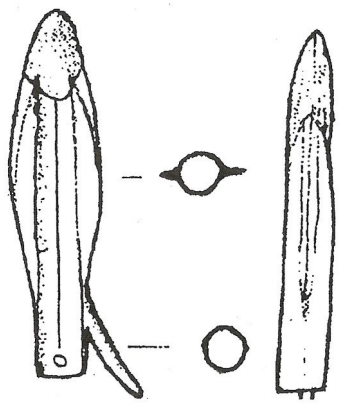
Ayanis 76

Sources:

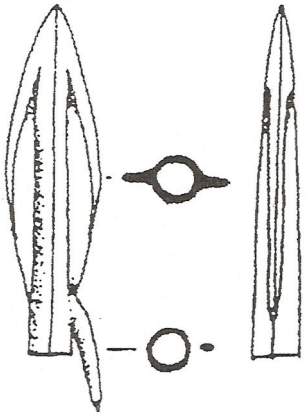
Site	No.	Type	Item No.	Source
Bastam	2	2-3	74/78	Kroll 1979, p. 154; Abb 3:1
Carchemish	3	2-3	116195	British Museum; 1922-5-11.328
Carchemish	4	2-3	116200	British Museum; 1922-5-11.333
Toprakkale	4	2-3	36	Wartke 1990, p. 61, fig. 9b; pl. 14:a.4
Ayanis	75	2-3	75	Derın & Muscarella 2001, fig. 6
Ayanis	76	2-3	76	Derın & Muscarella 2001, fig. 6

Plate 34

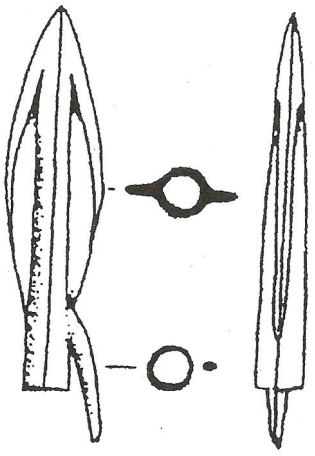
Type 2-3



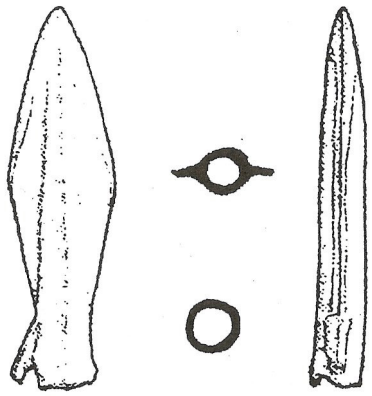
Ayanis 78



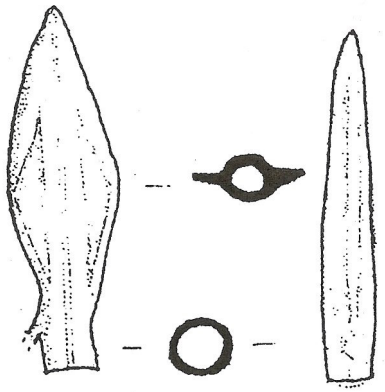
Ayanis 77



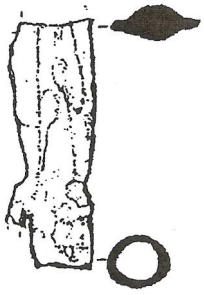
Ayanis 72



Ayanis 71



Ayanis 74



Ayanis 87

Nimrud 264

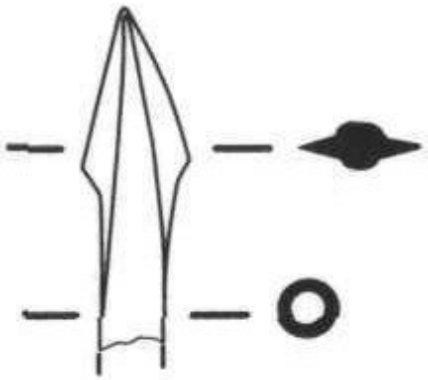
Sources:

Site	No.	Type	Item No.	Source
Ayanis	78	2-3	78	Derın & Muscarella 2001, fig. 6
Ayanis	77	2-3	77	Derın & Muscarella 2001, fig. 6
Ayanis	72	2-3	72	Derın & Muscarella 2001, fig. 6
Ayanis	71	2-3	71	Derın & Muscarella 2001, fig. 6
Ayanis	74	2-3	74	Derın & Muscarella 2001, fig. 6
Ayanis	87	2-3	87	Derın & Muscarella 2001, fig. 6
Nimrud	264	2-3	ND 4261	British Museum

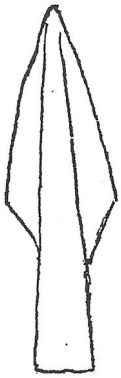
Plate 35

Type 2-5

Uruk 15



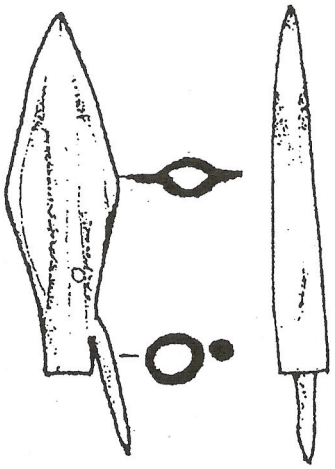
Hasanlu 85



Gerar 23

Gerar 16

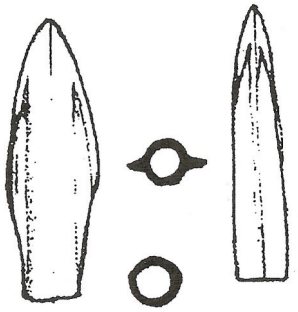
Type 2-6



Gerar 24

Ayanis 73

Type 2-7



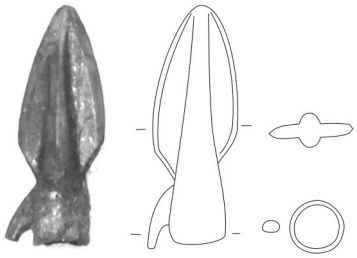
Ayanis 105

Sources:

Site	No.	Type	Item No.	Source
Uruk	15	2-5	W 14124	van Ess & Pedde 1992, p. 37, no. 355
Hasanlu	85	2-5	HAS 60-316	Thornton & Pigott 2011, p. 168, fig. 6.31:1
Gerar	23	2-5	pl. 29:08	Petrie 1928, pl. 29:08
Gerar	16	2-5	pl. 29:01	Petrie 1928, pl. 29:01
Gerar	24	2-6	pl. 29:09	Petrie 1928, pl. 29:09
Ayanis	73	2-6	73	Derın & Muscarella 2001, fig. 6
Ayanis	105	2-7	105	Derın & Muscarella 2001, fig. 7

Plate 36

Type 2-9

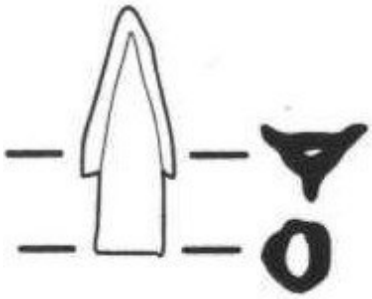


Carchemish 16

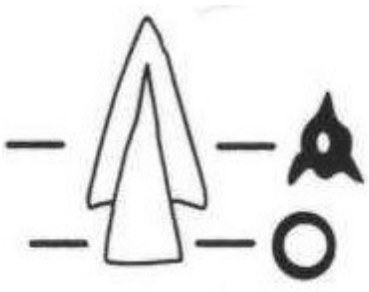
Type 2-11

Gerar 22

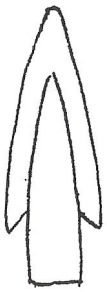
Type 2-14



Hasanlu 87



Hasanlu 86



Gerar 21

Sources:

Site	No.	Type	Item No.	Source
Carchemish	16	2-9	116206	British Museum, 1922-5-11.339
Gerar	22	2-11	pl. 29:07	Petrie 1928, pl. 29:07
Hasanlu	87	2-14	HAS 72-N346	Thornton & Pigott 2011, p. 168, fig. 6.31:3
Hasanlu	86	**2-14**	HAS 74-26	Thornton & Pigott 2011, p. 168, fig. 6.31:2
Gerar	21	2-14	pl. 29:06	Petrie 1928, pl. 29:06

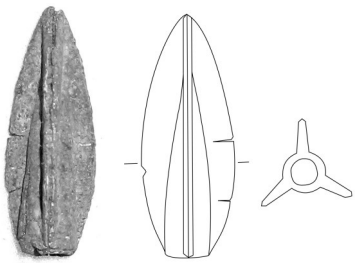
Sources for Plate 37:

Assur	33	3a-1	15528	Vorderasiatisches Museum Berlin
Nimrud	265	3a-1	ND 5307	British Museum
Uruk	18	3a-1	W 17739	van Ess & Pedde 1992, p. 38, no. 358
Gerar	27	3a-1	pl. 29:12	Petrie 1928, pl. 29:12
Assur	42	3a-1	6101	Vorderasiatisches Museum Berlin
Assur	43	3a-1?	5833a	Vorderasiatisches Museum Berlin
Nippur	3	3a-1?	1N 187	McCown 1967, p. 117, pl. 154:17
Assur	45	3a-2	19368a	Vorderasiatisches Museum Berlin
Assur	46	3a-2	19368b	Vorderasiatisches Museum Berlin
Assur	18	3a-2	19352c	Vorderasiatisches Museum Berlin
Assur	14	3a-2	19362c	Vorderasiatisches Museum Berlin
Assur	20	3a-2	19323a	Vorderasiatisches Museum Berlin
Assur	15	3a-2	19362d	Vorderasiatisches Museum Berlin
Assur	17	3a-2	19352b	Vorderasiatisches Museum Berlin

Plate 37

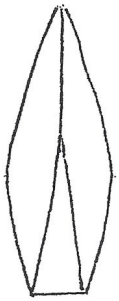
Type 3a-1

Assur 33



Nimrud 265

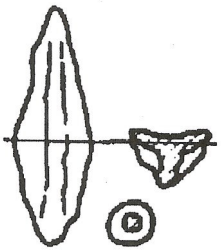
Uruk 18



Gerar 27

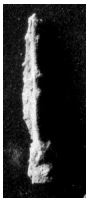
Assur 42

Assur 43



Nippur 3

Type 3a-2

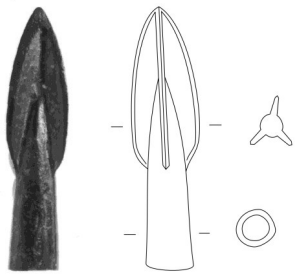


Assur 45

Assur 46

Assur 18

Assur 14



Assur 20

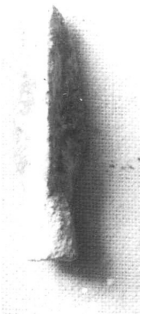
Assur 15

Assur 17

Sources: see Plate 36

Plate 38

Type 3a-2 (continued)

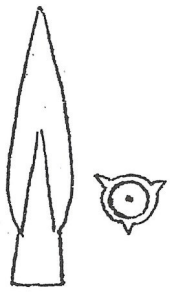


Assur 16

Assur 34

Assur 5

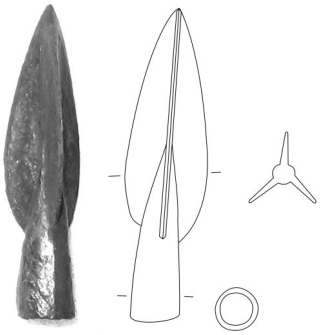
Assur 25



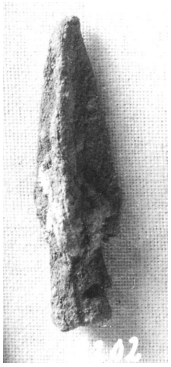
Gerar 32

Carchemish 17

Assur 36

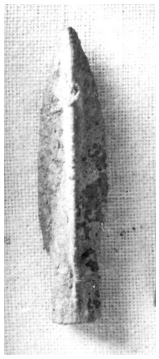


Carchemish 19

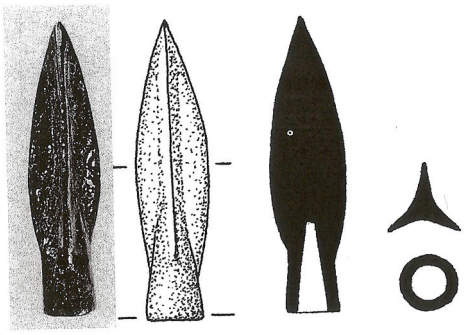


Assur 35

Carchemish 18



Assur 39



Uruk 27

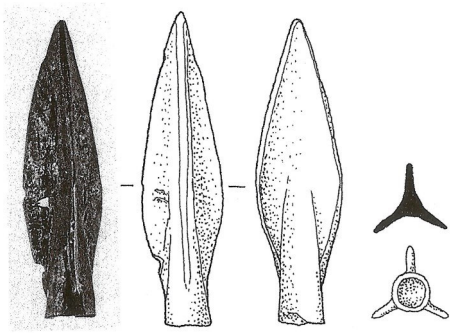
Assur 6

Sources:

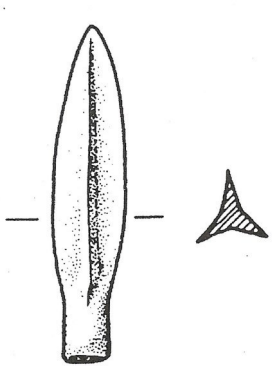
Site	No.	Type	Item No.	Source
Assur	16	3a-2	19352a	Vorderasiatisches Museum Berlin
Assur	34	3a-2	16671	Vorderasiatisches Museum Berlin
Assur	5	3a-2	8736	Vorderasiatisches Museum Berlin
Assur	25	3a-2	19336	Vorderasiatisches Museum Berlin
Gerar	32	3a-2	pl. 29:17	Petrie 1928, pl. 29:17
Carchemish	17	3a-2	116208	British Museum; 1922-5-11.341
Assur	36	3a-2	18326	Vorderasiatisches Museum Berlin
Carchemish	19	3a-2	116209	British Museum; 1922-5-11.342
Assur	35	3a-2	18202	Vorderasiatisches Museum Berlin
Carchemish	18	3a-2	116207	British Museum; 1922-5-11.340
Assur	39	3a-2	18360	Vorderasiatisches Museum Berlin
Uruk	27	3a-2	W 8756	Pedde 2000, p. 43, no. 670
Assur	6	3a-2	8582	Vorderasiatisches Museum Berlin

Plate 39

Type 3a-2 (continued)



Uruk 28



Nush-i Jan 12

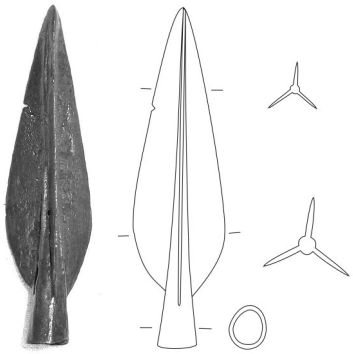
Sultantepe 4

Assur 12

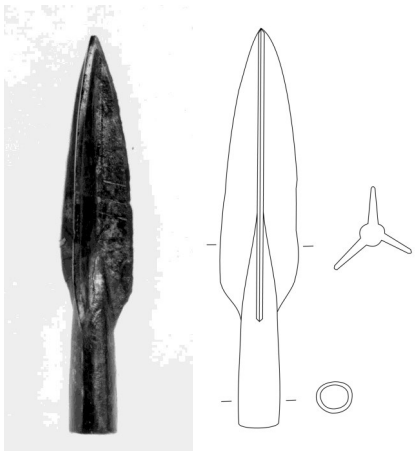
Assur 1

Gerar 31

Assur 8



Nimrud 268



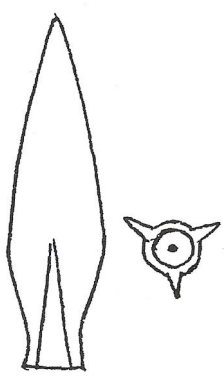
Assur 19

Sources:

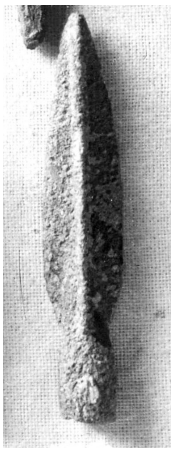
Site	No.	Type	Item No.	Source
Uruk	28	3a-2	W 15771	Pedde 2000, p. 43, no. 671
Nush-i Jan	12	3a-2	NU 67/167	Curtis 1984, p. 27, fig 6:259
Sultantepe	4	3a-2	Fig. 6:5	Lloyd 1954, p. 107, 109; Fig. 6
Assur	12	3a-2	19362a	Vorderasiatisches Museum Berlin
Assur	1	3a-2	11907b	Haller 1954, p. 26
Gerar	31	3a-2	pl. 29:16	Petrie 1928, pl. 29:16
Assur	8	3a-2	9099	Vorderasiatisches Museum Berlin
Nimrud	268	3a-2	ND 4149	British Museum
Assur	19	3a-2	19323b	Vorderasiatisches Museum Berlin

Plate 40

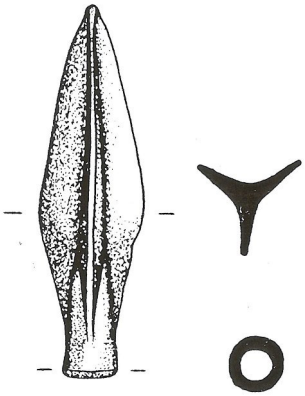
Type 3a-2 (continued)



Gerar 34

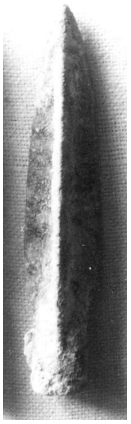


Assur 37



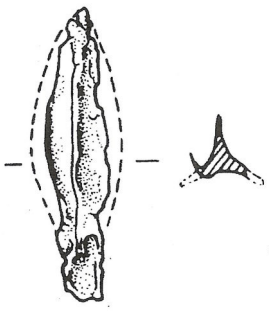
Uruk 21

Assur 10



Assur 13

Gerar 33



Nush-i Jan 15

Assur 7

Nimrud 267

Karchaghbyur 9

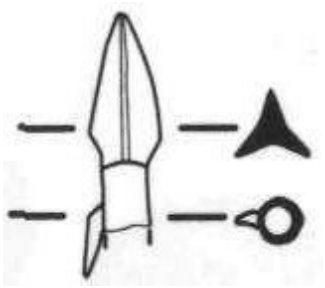
Sources:

Site	No.	Type	Item No.	Source
Gerar	34	3a-2	pl. 29:19	Petrie 1928, pl. 29:19
Assur	37	3a-2	18363	Vorderasiatisches Museum Berlin
Uruk	21	3a-2	W 24575	van Ess & Pedde 1992, p. 38, no. 361
Assur	10	3a-2	8472a	Vorderasiatisches Museum Berlin
Assur	13	3a-2	19362b	Vorderasiatisches Museum Berlin
Gerar	33	3a-2?	pl. 29:18	Petrie 1928, pl. 29:18
Nush-i Jan	15	3a-2?	NU 70/183	Curtis 1984, p. 27, fig 6:252
Assur	7	3a-2?	7526	Vorderasiatisches Museum Berlin
Nimrud	267	3a-2?	ND 4188	British Museum
Karchaghbyur	9	3a-2?	pl. 16:5	Yengibaryan 2002, p. 423, pl. 16:5

Plate 41

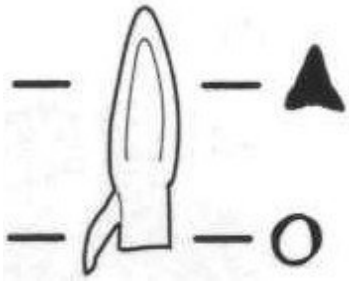
Type 3a-3

Assur 40



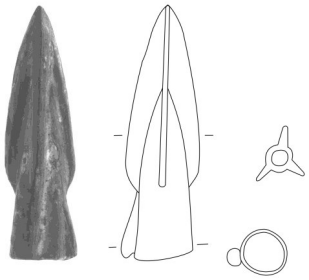
Hasanlu 88

Assur 52

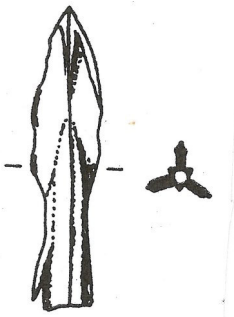


Hasanlu 90

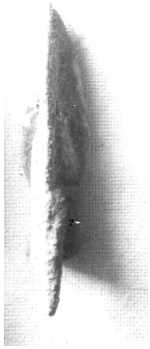
Assur 27



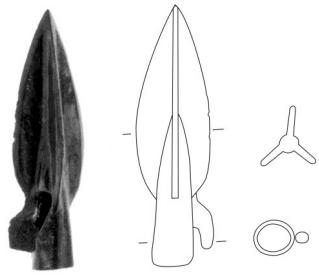
Assur 22



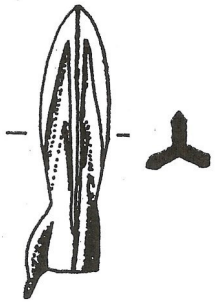
Toprakkale 2



Assur 23



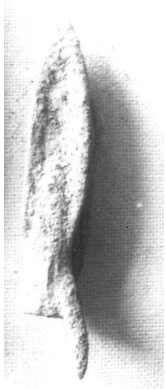
Assur 28



Toprakkale 1

Assur 31

Assur 49



Assur 24

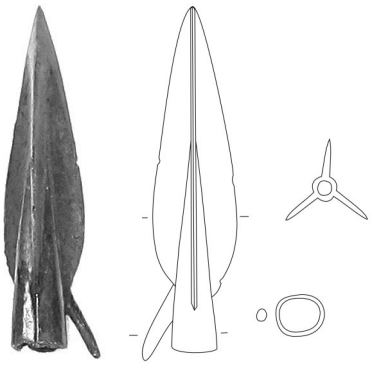
Assur 32

Sources:

Site	No.	Type	Item No.	Source
Assur	40	3a-3!	18363	Vorderasiatisches Museum Berlin
Hasanlu	88	3a-3	HAS 72-71	Thornton & Pigott 2011, p. 168, fig. 6.31:4
Assur	52	3a-3	11246	Vorderasiatisches Museum Berlin
Hasanlu	90	3a-3	HAS 72-8	Thornton & Pigott 2011, p. 168, fig. 6.31:6
Assur	27	3a-3	10086	Vorderasiatisches Museum Berlin
Assur	22	3a-3	19324b	Vorderasiatisches Museum Berlin
Toprakkale	2	3a-3	34	Wartke 1990, p. 61, fig. 9a; pl. 14:a.2
Assur	23	3a-3	19324b	Vorderasiatisches Museum Berlin
Assur	28	3a-3	11097b	Vorderasiatisches Museum Berlin
Toprakkale	1	3a-3	33	Wartke 1990, p. 61, fig. 9a; pl. 14:a.1
Assur	31	3a-3	14917	Vorderasiatisches Museum Berlin
Assur	49	3a-3	1372	Vorderasiatisches Museum Berlin
Assur	24	3a-3	19353	Vorderasiatisches Museum Berlin
Assur	32	3a-3	14927a	Vorderasiatisches Museum Berlin

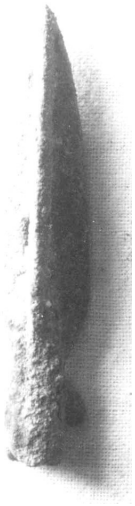
Type 3a-3 (continued)

Gerar 35



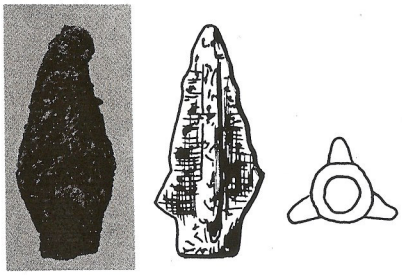
Carchemish 1

Carchemish 2



Assur 21

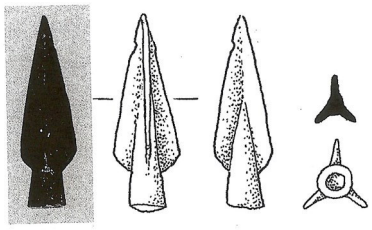
Type 3a-4



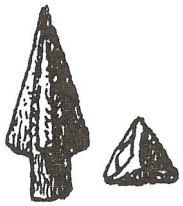
Uruk 19

Gerar 30

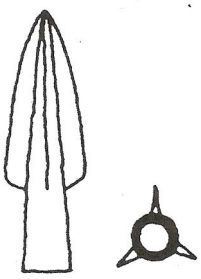
Type 3a-5



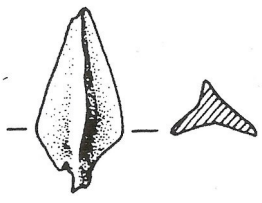
Uruk 26



Sialk 74



Bastam 10

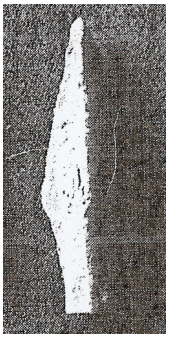


Nush-i Jan 14

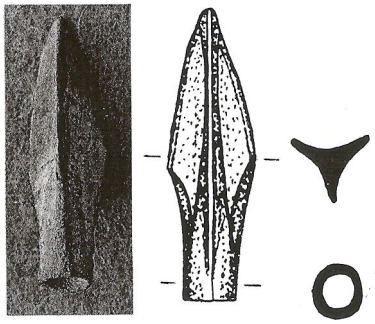
Sources: see Plate 43

Plate 43

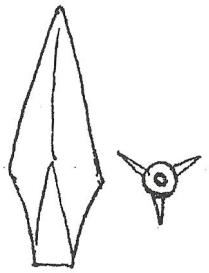
Type 3a-7



Assur 48



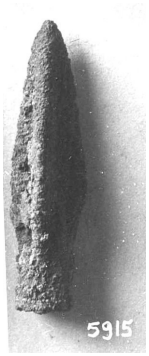
Uruk 20



Gerar 29

Type 3a-8

Nimrud 266



Assur 41

Sources for Plate 42:

Site	No.	Type	Item No.	Source
Gerar	35	3a-3	pl. 29:20	Petrie 1928, pl. 29:20
Carchemish	1	3a-3	116196	British Museum, 1922-4-11.329
Carchemish	2	3a-3	116199	British Museum, 1922-5-11.332
Assur	21	3a-3	19324a	Vorderasiatisches Museum Berlin
Uruk	19	3a-4	W 21176	van Ess & Pedde 1992, p. 38, no. 359
Gerar	30	3a-4	pl. 29:15	Petrie 1928, pl. 29:15
Uruk	26	3a-5	W 7332	Pedde 2000, p. 42, no. 669
Sialk	74	3a-5	pl. 92:18	Ghirshman 1939, vol. 2, p. 248, pl. 92
Bastam	10	3a-5	75/49	Kroll 1979, p. 164; Abb 15:1
Nush-i Jan	14	3a-5?	NU 74/26	Curtis 1984, p. 27, fig 6:251

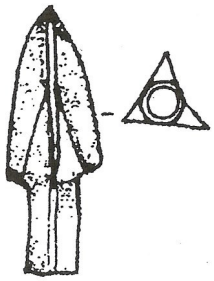
Sources for Plate 43:

Assur	48	3a-7	21110	Vorderasiatisches Museum Berlin
Uruk	20	3a-7	W 24377	van Ess & Pedde 1992, p. 38, no. 360
Gerar	29	3a-7	pl. 29:14	Petrie 1928, pl. 29:14
Nimrud	266	3a-8	ND 3298	British Museum
Assur	41	3a-8	5915	Vorderasiatisches Museum Berlin

Plate 44

Type 3a-11

Assur 53

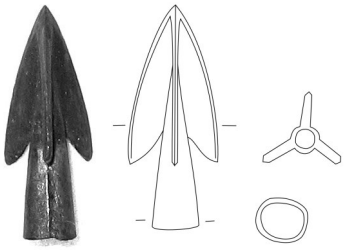


Ayanis 107

Nush-i Jan 13

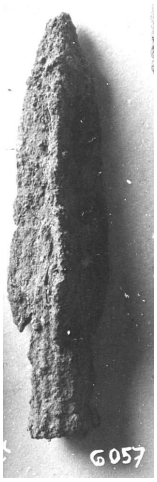
Type 3a-14

Carchemish 12



Carchemish 13

Carchemish 14



Assur 44

Sources:

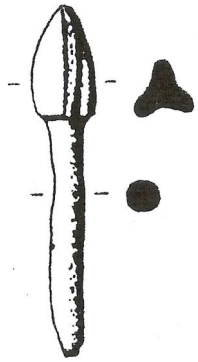
Site	No.	Type	Item No.	Source
Assur	53	3a-11	11319	Vorderasiatisches Museum Berlin
Ayanis	107	3a-11	107	Derın & Muscarella 2001, fig. 7
Nush-i Jan	13	3a-11	NU 70/351	Curtis 1984, p. 27, fig 6:250
Carchemish	12	3a-14	116203	British Museum, 1922-5-11.336
Carchemish	13	3a-14	116202	British Museum, 1922-5-11.335
Carchemish	14	3a-14	116204	British Museum, 1922-5-11.337
Assur	44	3a-14?	6057	Vorderasiatisches Museum Berlin

Sources for Plate 45:

Toprakkale	22	3a-16!	351	Wartke 1990, p. 127, fig. 32p; pl. 39:b.10
Marlik	25	3a-16	1523 M	Negahban 1996, p. 280, pl. 126:848
Marlik	27	3a-16	1523 M	Negahban 1996, p. 280, pl. 126:848
Marlik	26	3a-16	1523 M	Negahban 1996, p. 280, pl. 126:848
Hasanlu	91	3a-19	HAS 74-N9	Thornton & Pigott 2011, p. 168, fig. 6.31:7
Sultantepe	5	3a-19	Fig. 6:6	Lloyd 1954, p. 107, 109; Fig. 6
Sultantepe	3	3a-19	Fig. 6:4	Lloyd 1954, p. 107, 109; Fig. 6
Gerar	36	3b-1	pl. 29:21	Petrie 1928, pl. 29:21
Sialk	73	3b-2	pl. 92:17	Ghirshman 1939, vol. 2, p. 248, pl. 92
Hasanlu	89	3b-2	HAS 58-58	Thornton & Pigott 2011, p. 168, fig. 6.31:5
Gerar	37	3b-4	pl. 29:22	Petrie 1928, pl. 29:22

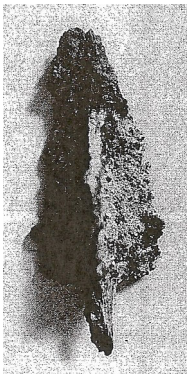
Plate 45

Type 3a-16



Toprakkale 22

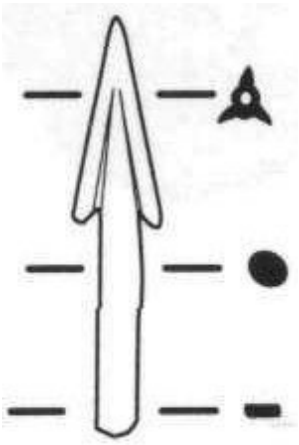
Marlik 25



Marlik 27

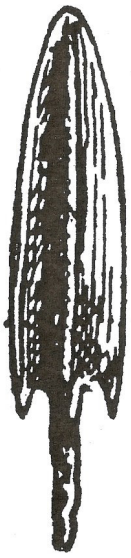
Marlik 26

Type 3a-19



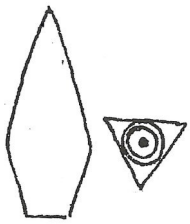
Hasanlu 91

Sultantepe 5



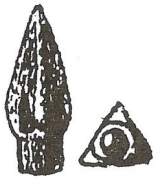
Sultantepe 3

Type 3b-1

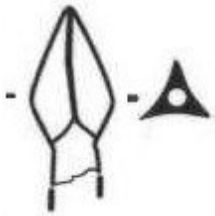


Gerar 36

Type 3b-2

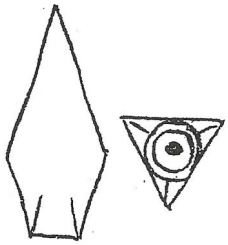


Sialk 73



Hasanlu 89

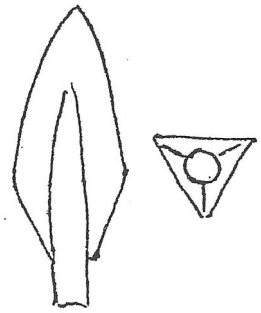
Type 3b-4



Gerar 37

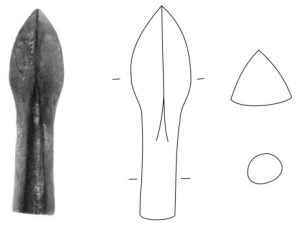
Sources: see Plate 44

Type 3b-16



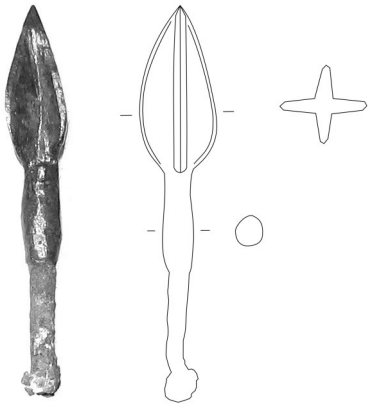
Gerar 28

Type 3c-2

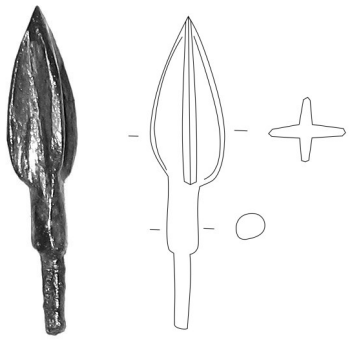


Assur 26

Type 4-17

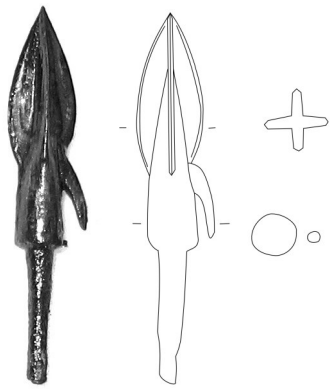


Carchemish 10



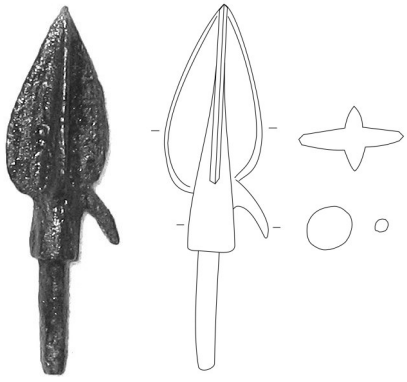
Carchemish 9

Type 4-18



Carchemish 11

Carchemish 6



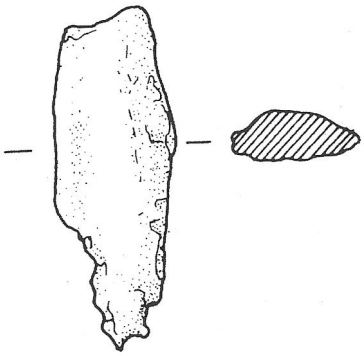
Carchemish 7

Sources: see Plate 47

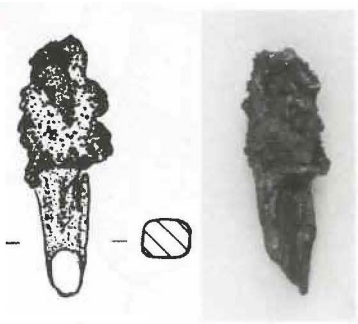
Plate 47

Type 5 (fragmentary pieces)

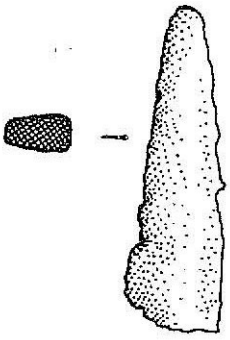
Nimrud 240



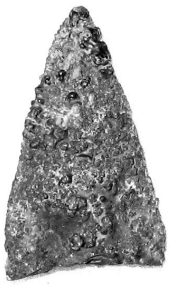
Nush-i Jan 5



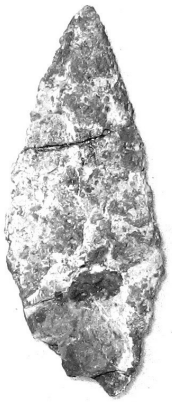
Knedig 13



Lachish 69



Nimrud 243



Nimrud 244

Sources for Plate 46:

Site	No.	Type	Item No.	Source
Gerar	28	3b-16	pl. 29:13	Petrie 1928, pl. 29:13
Assur	26	3c-2	19323c	Vorderasiatisches Museum Berlin
Carchemish	10	4-17	116205	British Museum; 1922-5-11.338
Carchemish	9	4-17	116201	British Museum; 1922-5-11.334
Carchemish	11	4-18	116192	British Museum; 1922-5-11.325
Carchemish	6	4-18	116191	British Museum; 1922-5-11.324
Carchemish	7	4-18	116193	British Museum; 1922-5-11.326

Sources for Plate 47:

Nimrud	240	5?	ND 10944	British Museum
Nush-i Jan	5	5?	NU 74/52	Curtis 1984, p. 26, fig 6:252
Tell Knedig	13	5?	1123	Klengel-Brandt et al 2005, p. 306, pl. 202
Lachish	69	5?	449/61	Rothenberg 1975, p. 75, pl. 36:5
Nimrud	243	5?	ND 2525	British Museum
Nimrud	244	5?	ND 2525	British Museum

Plate 48

Type 5a-1

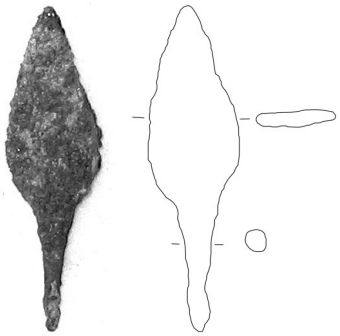
Sialk 62

Nimrud 262

Nimrud 102

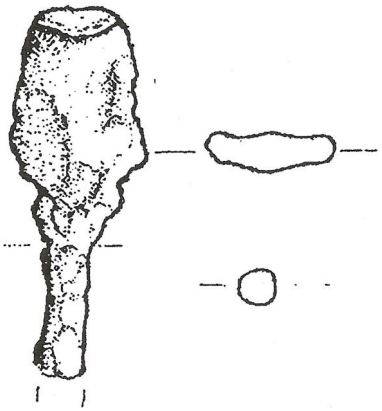
Nimrud 130

Nimrud 225



Nimrud 110

Nimrud 49



Ayanis 37

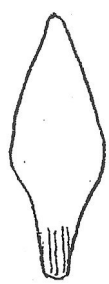
Nimrud 230

Sources:

Site	**No.**	**Type**	**Item No.**	**Source**
Sialk	62	5a-1	pl. 92:6	Ghirshman 1939, vol. 2, p. 248, pl. 92
Nimrud	262	5a-1	ND 6182	British Museum
Nimrud	102	5a-1	ND 10944	British Museum
Nimrud	130	5a-1	ND 10944	British Museum
Nimrud	225	5a-1	ND 10944	British Museum
Nimrud	110	5a-1	ND 10944	British Museum; drawing by Szudy
Nimrud	49	5a-1	ND 10944	British Museum
Ayanis	37	5a-1	37	Derın & Muscarella 2001, fig. 3
Nimrud	230	5a-1	ND 10944	British Museum

Plate 49

Type 5a-1 (continued)



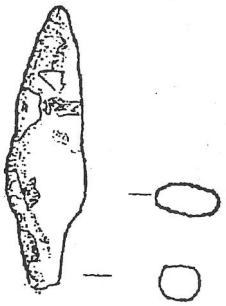
Gerar 60

Nimrud 221

Nimrud 63

Nimrud 129

Nimrud 72

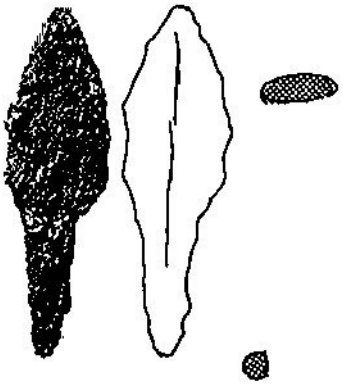


Ayanis 5

Nimrud 215

Nimrud 220

Nimrud 212



Lachish 349

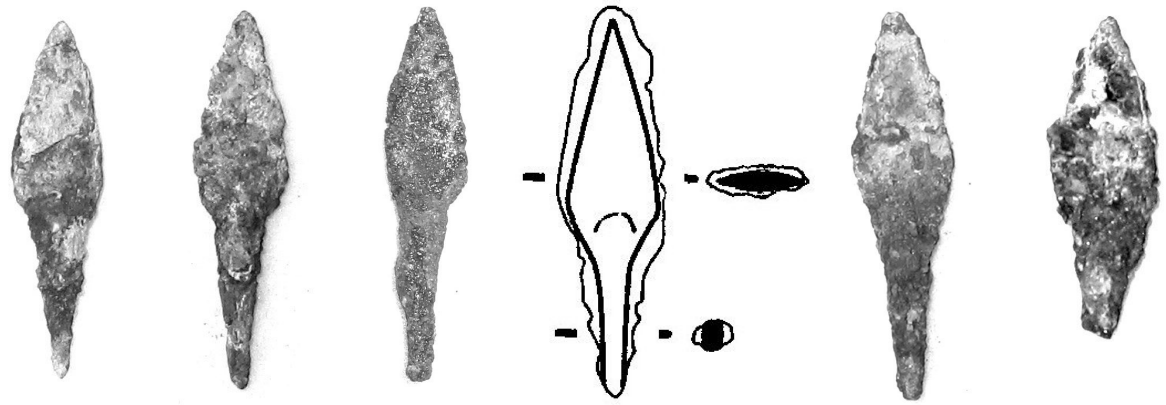
Nimrud 176

Sources:

Site	No.	Type	Item No.	Source
Gerar	60	5a-1	pl. 29:45	Petrie 1928, pl. 29:45
Nimrud	221	5a-1	ND 10944	British Museum
Nimrud	63	5a-1	ND 10944	British Museum
Nimrud	129	5a-1	ND 10944	British Museum
Nimrud	72	5a-1	ND 10944	British Museum
Ayanis	5	5a-1	5	Derın & Muscarella 2001, fig. 2
Nimrud	215	5a-1	ND 10944	British Museum
Nimrud	220	5a-1	ND 10944	British Museum
Nimrud	212	5a-1	ND 10944	British Museum
Lachish	349	5a-1	61601/60	Gottlieb 2004, p. 1941, fig. 27.15:16
Nimrud	176	5a-1	ND 10944	British Museum

Plate 50

Type 5a-1 (continued)



Nimrud 45 Nimrud 111 Nimrud 257 Hasanlu 11 Nimrud 70 Nimrud 194

Nimrud 106 Nimrud 96 Nimrud 94 Nimrud 51 Nimrud 99 Nimrud 196 Nimrud 83

Sources:

Site	No.	Type	Item No.	Source
Nimrud	45	5a-1	ND 10944	British Museum
Nimrud	111	5a-1	ND 10944	British Museum
Nimrud	257	5a-1	ND 9265	British Museum
Hasanlu	11	5a-1	HAS 72-N116 n	Thornton & Pigott 2011, p. 141, fig. 6.2:11
Nimrud	70	5a-1	ND 10944	British Museum
Nimrud	194	5a-1	ND 10944	British Museum
Nimrud	106	5a-1	ND 10944	British Museum
Nimrud	96	5a-1	ND 10944	British Museum
Nimrud	94	5a-1	ND 10944	British Museum
Nimrud	51	5a-1	ND 10944	British Museum
Nimrud	99	5a-1	ND 10944	British Museum
Nimrud	196	5a-1	ND 10944	British Museum
Nimrud	83	5a-1	ND 10944	British Museum

Plate 51

Type 5a-1 (continued)

Nimrud 95

Nimrud 62

Nimrud 67

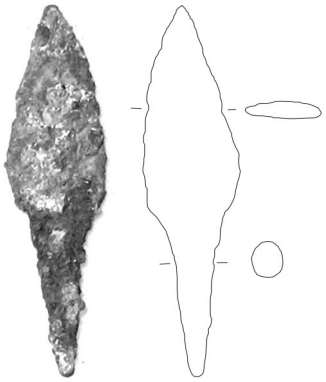
Nimrud 162

Nimrud 108

Gerar 55

Nimrud 117

Nimrud 190



Nimrud 66

Nimrud 125

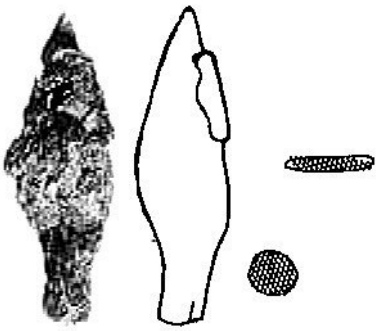
Nimrud 144

Sources:

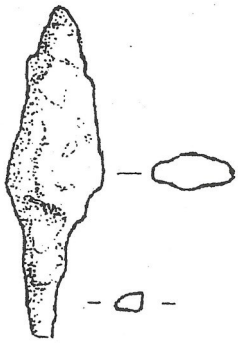
Site	No.	Type	Item No.	Source
Nimrud	95	5a-1	ND 10944	British Museum
Nimrud	62	5a-1	ND 10944	British Museum
Nimrud	67	5a-1	ND 10944	British Museum
Nimrud	162	5a-1	ND 10944	British Museum
Nimrud	108	5a-1	ND 10944	British Museum
Gerar	55	5a-1	pl. 29:40	Petrie 1928, pl. 29:40
Nimrud	117	5a-1	ND 10944	British Museum
Nimrud	190	5a-1	ND 10944	British Museum
Nimrud	66	5a-1	ND 10944	British Museum
Nimrud	125	5a-1	ND 10944	British Museum
Nimrud	144	5a-1	ND 10944	British Museum

Type 5a-1 (continued)

Nimrud 217 Nimrud 214



Lachish 33



Ayanis 8

Gerar 38

Nimrud 109

Nimrud 228

Nimrud 78

Nimrud 133

Nimrud 113

Nimrud 71

Sources:

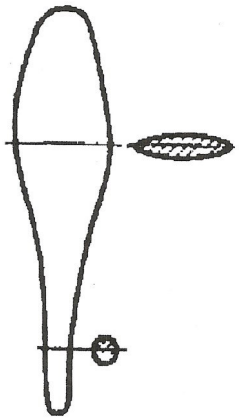
Site	No.	Type	Item No.	Source
Nimrud	217	5a-1	ND 10944	British Museum
Nimrud	214	5a-1	ND 10944	British Museum
Lachish	33	5a-1	6294	Gottlieb 2004, p. 1949, fig. 27.19:9
Ayanis	8	5a-1	8	Derın & Muscarella 2001, fig. 2
Gerar	38	5a-1	pl. 29:23	Petrie 1928, pl. 29:23
Nimrud	109	5a-1	ND 10944	British Museum
Nimrud	228	5a-1	ND 10944	British Museum
Nimrud	78	5a-1	ND 10944	British Museum
Nimrud	133	5a-1	ND 10944	British Museum
Nimrud	113	5a-1	ND 10944	British Museum
Nimrud	71	5a-1	ND 10944	British Museum

Plate 53

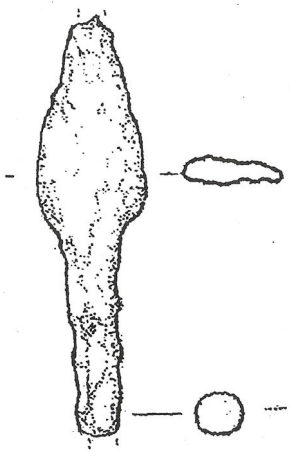
Type 5a-1 (continued)

Nimrud 123

Nimrud 188



Nippur 1



Ayanis 15

Nimrud 60

Nimrud 124

Sialk 61

Nimrud 152

Nimrud 185

Nimrud 148

Nimrud 89

Sources:

Site	No.	Type	Item No.	Source
Nimrud	123	5a-1	ND 10944	British Museum
Nimrud	188	5a-1	ND 10944	British Museum
Nippur	1	5a-1	2N 214	McCown 1967, p. 116, pl. 154:15
Ayanis	15	5a-1	15	Derın & Muscarella 2001, fig. 2
Nimrud	60	5a-1	ND 10944	British Museum
Nimrud	124	5a-1	ND 10944	British Museum
Sialk	61	5a-1	pl. 92:5	Ghirshman 1939, vol. 2, p. 248, pl. 92
Nimrud	152	5a-1	ND 10944	British Museum
Nimrud	185	5a-1	ND 10944	British Museum
Nimrud	148	5a-1	ND 10944	British Museum
Nimrud	89	5a-1	ND 10944	British Museum

Plate 54

Type 5a-1 (continued)

Nimrud 191 Nimrud 120 Nimrud 155 Nimrud 116
Nimrud 199 Nimrud 201 Nimrud 77

Nimrud 164 Nimrud 160 Nimrud 193 Nimrud 165
Nimrud 112 Nimrud 74 Nimrud 76

Sources:

Site	No.	Type	Item No.	Source
Nimrud	191	5a-1	ND 10944	British Museum
Nimrud	199	5a-1	ND 10944	British Museum
Nimrud	120	5a-1	ND 10944	British Museum
Nimrud	201	5a-1	ND 10944	British Museum
Nimrud	155	5a-1	ND 10944	British Museum
Nimrud	77	5a-1	ND 10944	British Museum
Nimrud	116	5a-1	ND 10944	British Museum
Nimrud	164	5a-1	ND 10944	British Museum
Nimrud	112	5a-1	ND 10944	British Museum
Nimrud	160	5a-1	ND 10944	British Museum
Nimrud	74	5a-1	ND 10944	British Museum
Nimrud	193	5a-1	ND 10944	British Museum
Nimrud	76	5a-1	ND 10944	British Museum
Nimrud	165	5a-1	ND 10944	British Museum

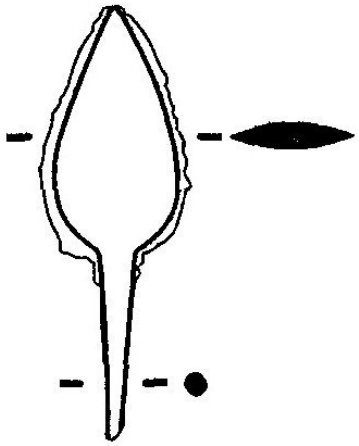
Type 5a-1 (continued)

Nimrud 55

Nimrud 143

Nimrud 259

Nimrud 179



Hasanlu 30

Nimrud 177

Nimrud 92

Nimrud 209

Nimrud 132

Nimrud 80

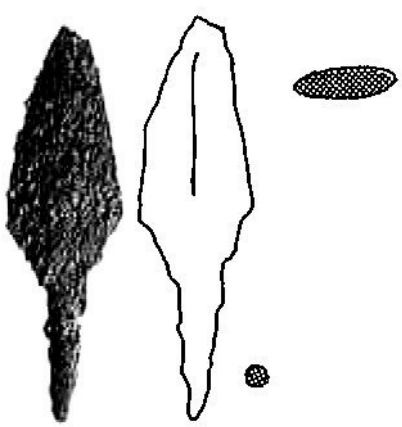
Nimrud 85

Sources:

Site	No.	Type	Item No.	Source
Nimrud	55	5a-1	ND 10944	British Museum
Nimrud	143	5a-1	ND 10944	British Museum
Nimrud	259	5a-1	ND 3632	British Museum
Nimrud	179	5a-1	ND 10944	British Museum
Hasanlu	30	5a-1	HAS 62-48	Thornton & Pigott 2011, p. 142, fig. 6.3:13
Nimrud	177	5a-1	ND 10944	British Museum
Nimrud	92	5a-1	ND 10944	British Museum
Nimrud	209	5a-1	ND 10944	British Museum
Nimrud	132	5a-1	ND 10944	British Museum
Nimrud	80	5a-1	ND 10944	British Museum
Nimrud	85	5a-1	ND 10944	British Museum

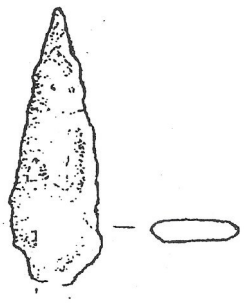
Plate 56

Type 5a-1 (continued)



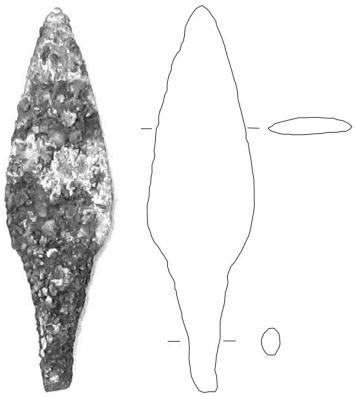
Lachish 350

Nimrud 93 Nimrud 169 Nimrud 187

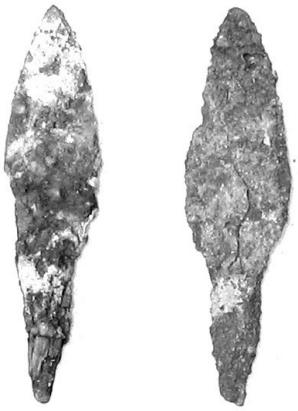


Ayanis 7

Nimrud 122 Nimrud 207



Nimrud 43



Nimrud 173 Nimrud 53

Sources:

Site	No.	Type	Item No.	Source
Lachish	350	5a-1	62043/60	Gottlieb 2004, p. 1941, fig. 27.15:17
Nimrud	93	5a-1	ND 10944	British Museum
Nimrud	169	5a-1	ND 10944	British Museum
Nimrud	187	5a-1	ND 10944	British Museum
Ayanis	7	5a-1	7	Derın & Muscarella 2001, fig. 2
Nimrud	122	5a-1	ND 10944	British Museum
Nimrud	207	5a-1	ND 10944	British Museum
Nimrud	43	5a-1	ND 10944	British Museum
Nimrud	173	5a-1	ND 10944	British Museum
Nimrud	53	5a-1	ND 10944	British Museum

Plate 57

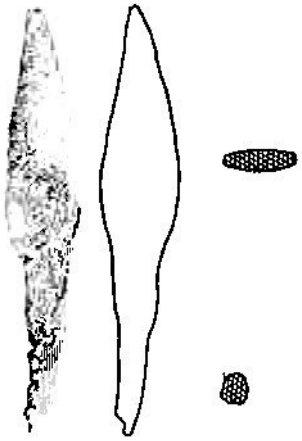
Type 5a-1 (continued)

Nimrud 69

Nimrud 97

Nimrud 245

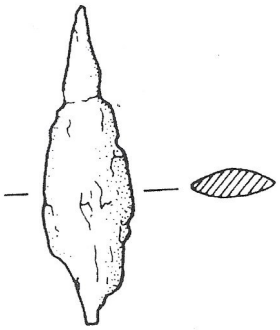
Nimrud 59



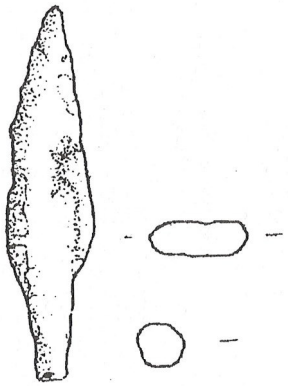
Lachish 58

Nimrud 137

Nimrud 54



Nush-i Jan 1



Ayanis 6

Sources:

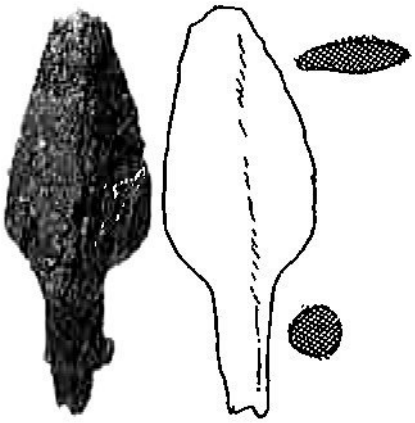
Site	No.	Type	Item No.	Source
Nimrud	69	5a-1	ND 10944	British Museum
Nimrud	97	5a-1	ND 10944	British Museum
Nimrud	245	5a-1	ND 7534	British Museum
Nimrud	59	5a-1	ND 10944	British Museum
Lachish	58	5a-1	7061	Gottlieb 2004, p. 1949, fig. 27.19:18
Nimrud	137	5a-1	ND 10944	British Museum
Nimrud	54	5a-1	ND 10944	British Museum
Nush-i Jan	1	5a-1	NU 77/52	Curtis 1984, p. 26, fig 6:248
Ayanis	6	5a-1	6	Derın & Muscarella 2001, fig. 2

Plate 58

Type 5a-1 (continued)

Nimrud 68

Nimrud 42



Lachish 121

Nimrud 256

Nimrud 58

Nimrud 135

Nimrud 167

Nimrud 170

Nimrud 178

Nimrud 163

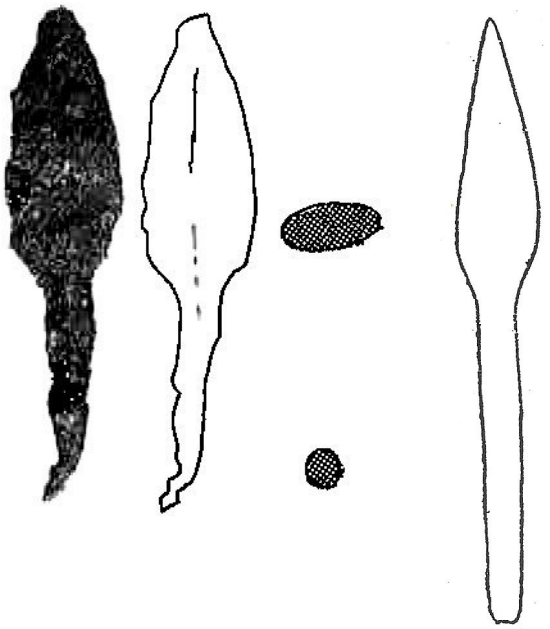
Nimrud 172

Sources:

Site	No.	Type	Item No.	Source
Nimrud	68	5a-1	ND 10944	British Museum
Nimrud	42	5a-1	ND 10944	British Museum
Lachish	121	5a-1	39092/60	Gottlieb 2004, p. 1917, fig. 27.3:16
Nimrud	256	5a-1	ND 5220	British Museum
Nimrud	58	5a-1	ND 10944	British Museum
Nimrud	135	5a-1	ND 10944	British Museum
Nimrud	167	5a-1	ND 10944	British Museum
Nimrud	170	5a-1	ND 10944	British Museum
Nimrud	178	5a-1	ND 10944	British Museum
Nimrud	163	5a-1	ND 10944	British Museum
Nimrud	172	5a-1	ND 10944	British Museum

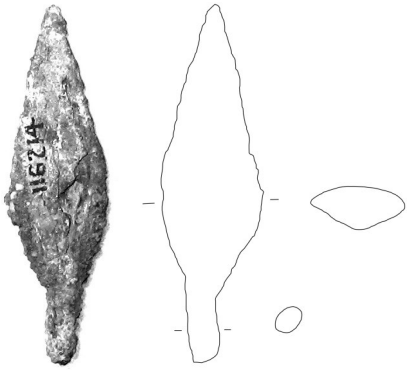
Plate 59

Type 5a-1 (continued)

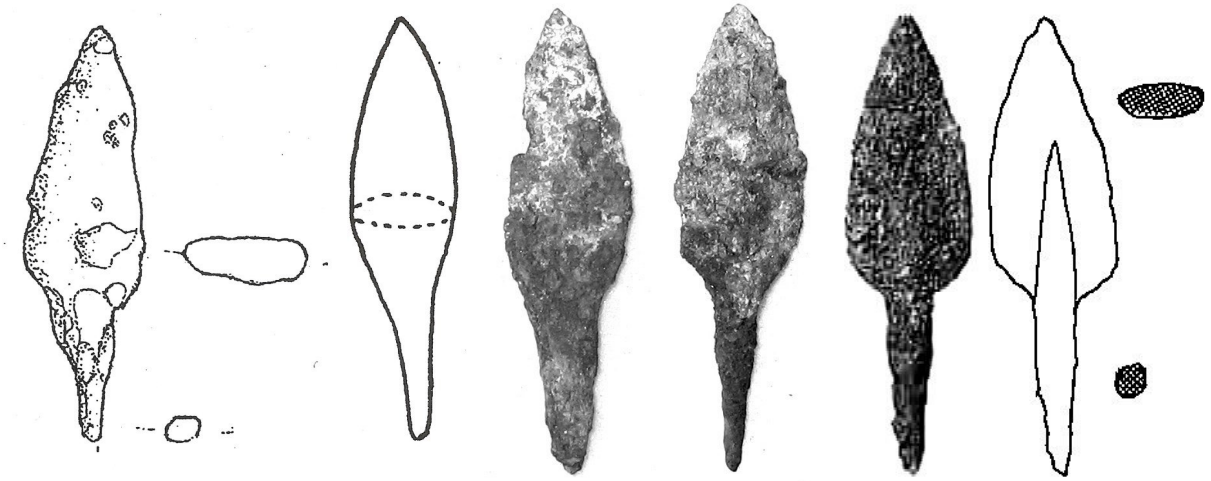


Lachish 309

Gerar 64



Carchemish 23



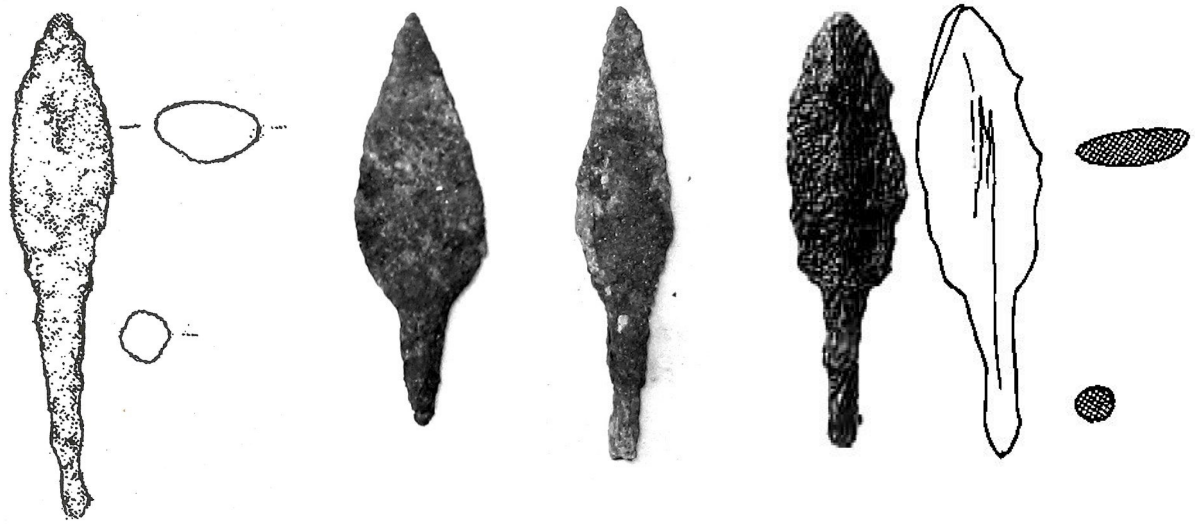
Ayanis 9 Lachish 57 Nimrud 140 Nimrud 180 Lachish 346

Sources:

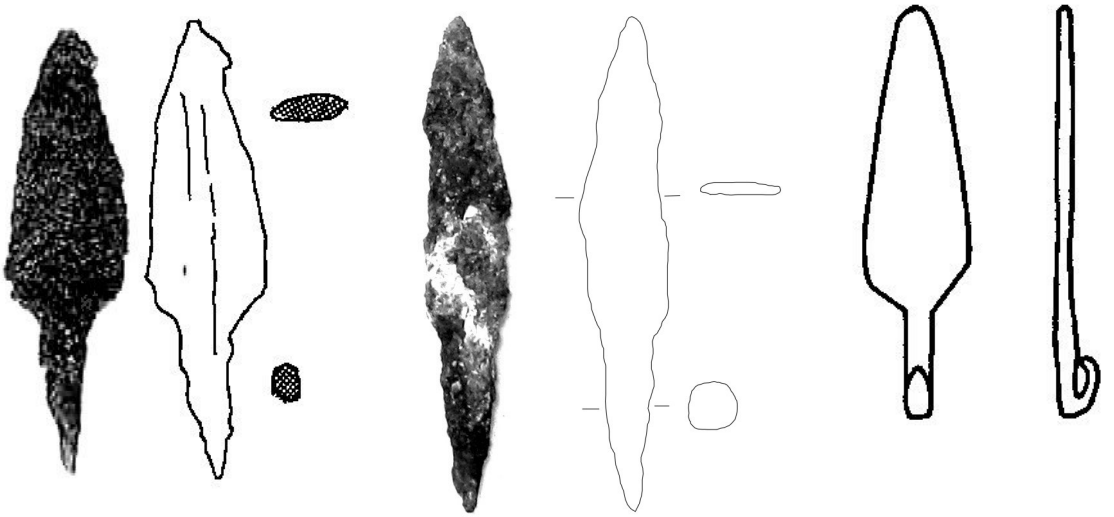
Site	No.	Type	Item No.	Source
Lachish	309	5a-1	61517/60	Gottlieb 2004, p. 1937, fig. 27.13:16
Gerar	64	5a-1	pl. 29:49	Petrie 1928, pl. 29:49
Carchemish	23	5a-1	116214	British Museum; 1922-5-11.347
Ayanis	9	5a-1	9	Derın & Muscarella 2001, fig. 2
Lachish	57	5a-1	7173	Tufnell et al 1953, p. 125, pl. 60:45
Nimrud	140	5a-1	ND 10944	British Museum
Nimrud	180	5a-1	ND 10944	British Museum
Lachish	346	5a-1	60255/60	Gottlieb 2004, p. 1941, fig. 27.15:13

Plate 60

Type 5a-1 (continued)



Ayanis 10 Nimrud 197 Nimrud 181 Lachish 130



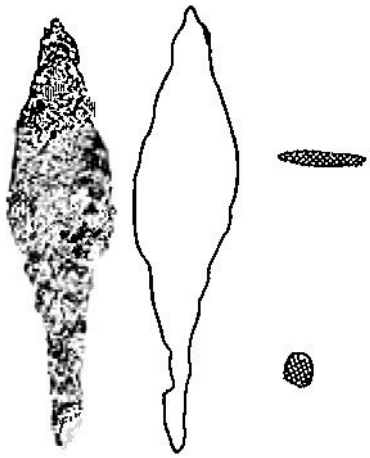
Lachish 347 Nimrud 200 Hasanlu 66

Sources:

Site	No.	Type	Item No.	Source
Ayanis	10	5a-1	10	Derın & Muscarella 2001, fig. 2
Nimrud	197	5a-1	ND 10944	British Museum
Nimrud	181	5a-1	ND 10944	British Museum
Lachish	130	5a-1	30893/60	Gottlieb 2004, p. 1919, fig. 27.4:7
Lachish	347	5a-1	61994/60	Gottlieb 2004, p. 1941, fig. 27.15:14
Nimrud	200	5a-1	ND 10944	British Museum
Hasanlu	66	5a-1	HAS 60-871 a	Thornton & Pigott 2011, p. 145, fig. 6.6:19

Plate 61

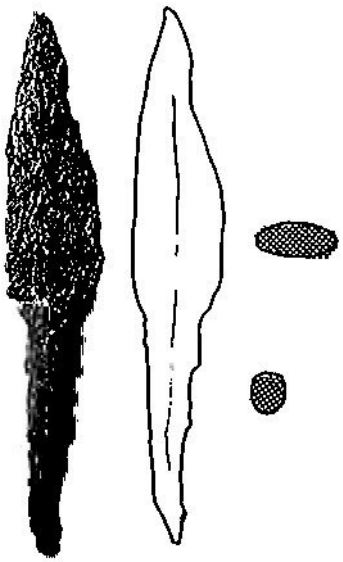
Type 5a-1 (continued)



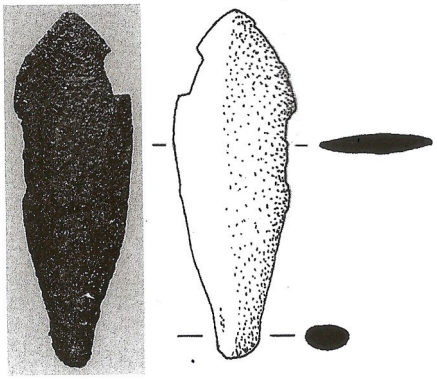
Lachish 369

Nimrud 141

Nimrud 138

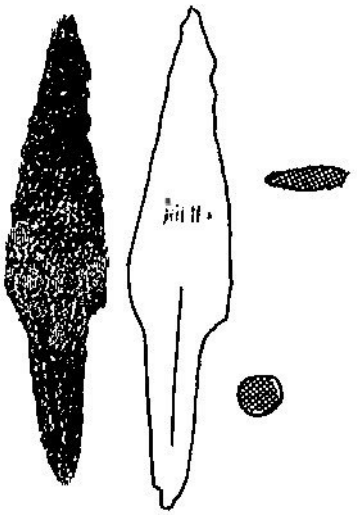


Lachish 317



Uruk 24

Nimrud 241



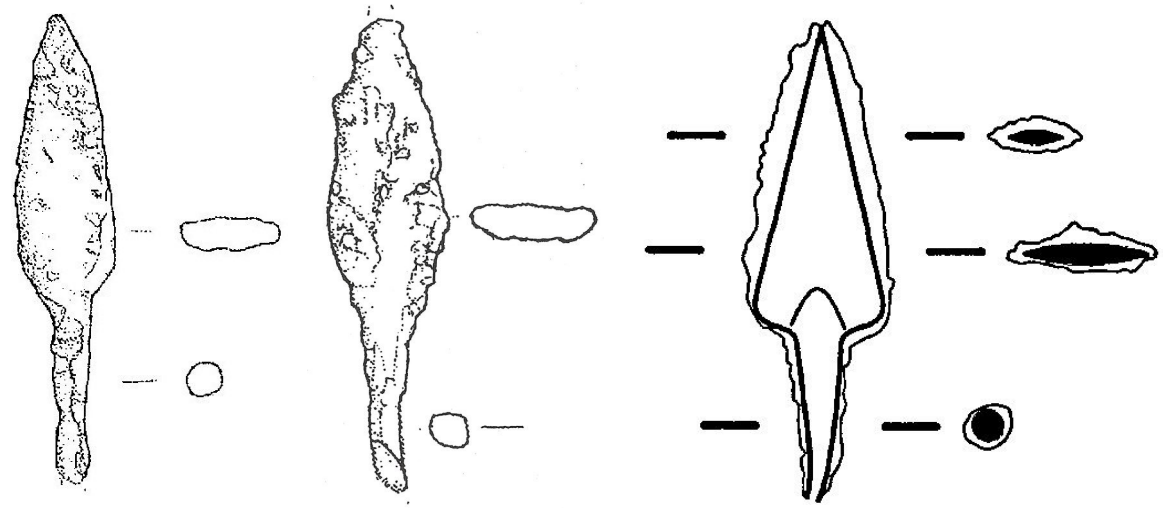
Lachish 338

Sources:

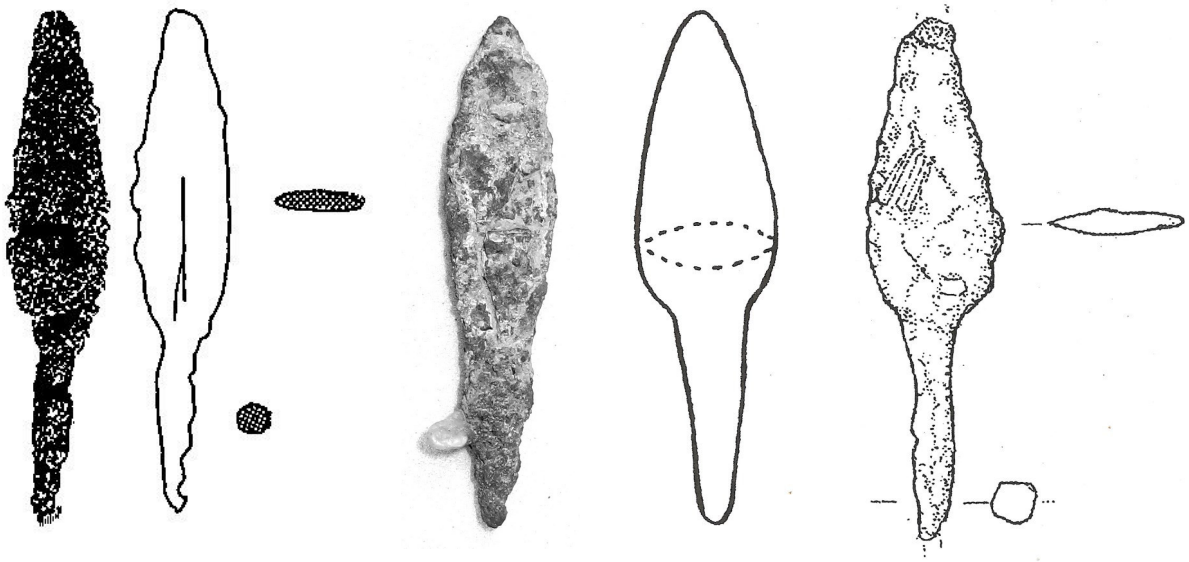
Site	No.	Type	Item No.	Source
Lachish	369	5a-1	5481	Gottlieb 2004, p. 1949, fig. 27.19:17
Nimrud	141	5a-1	ND 10944	British Museum
Nimrud	138	5a-1	ND 10944	British Museum
Lachish	317	5a-1	60367/60	Gottlieb 2004, p. 1939, fig. 27.14:1
Uruk	24	5a-1	W 14744	Pedde 2000, p. 42, no. 667
Nimrud	241	5a-1	ND 10944	British Museum
Lachish	338	5a-1	61071/60	Gottlieb 2004, p. 1941, fig. 27.15:4

Plate 62

Type 5a-1 (continued)



Ayanis 12 Ayanis 20 Hasanlu 12



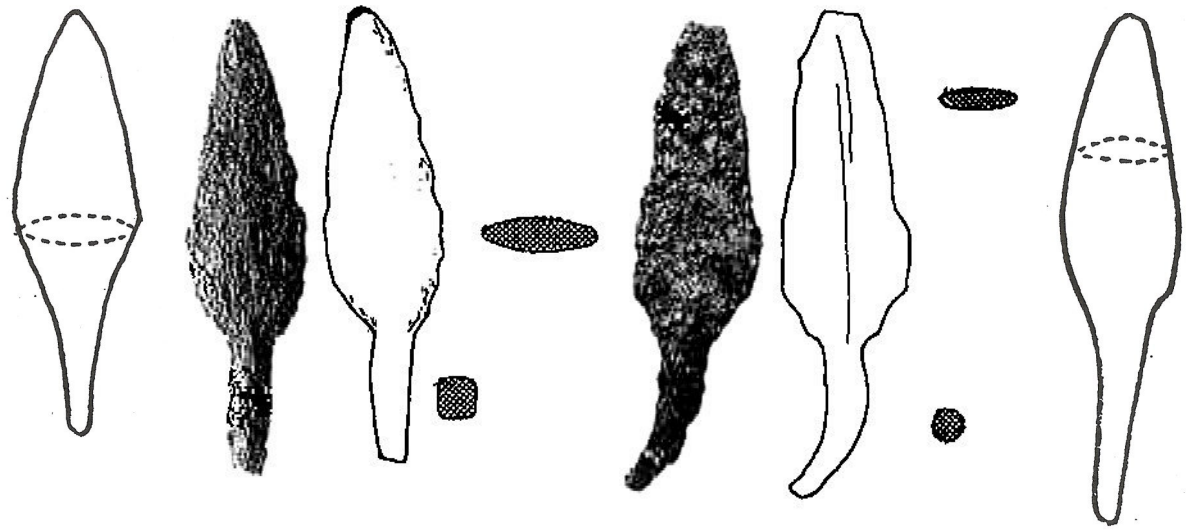
Lachish 318 Nimrud 258 Lachish 56 Ayanis 21

Sources:

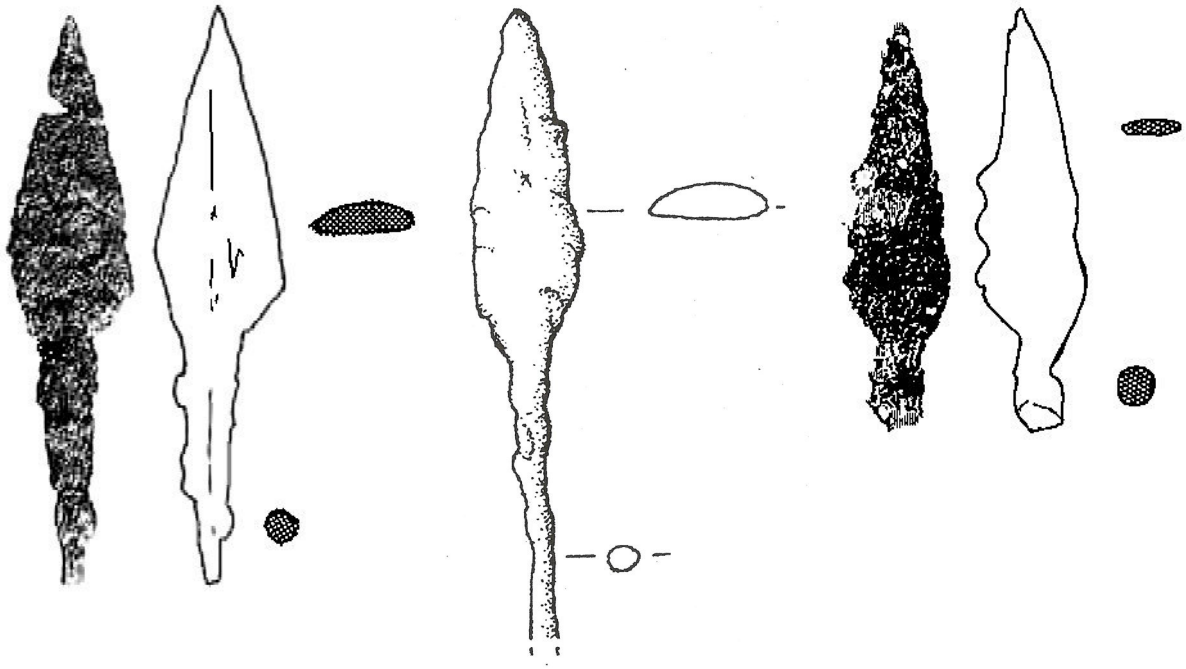
Site	No.	Type	Item No.	Source
Ayanis	12	5a-1	12	Derın & Muscarella 2001, fig. 2
Ayanis	20	5a-1	20	Derın & Muscarella 2001, fig. 2
Hasanlu	12	5a-1	HAS 64-989 e	Thornton & Pigott 2011, p. 141, fig. 6.2:12
Lachish	318	5a-1	61093/60	Gottlieb 2004, p. 1939, fig. 27.14:2
Nimrud	258	5a-1	ND 3292	British Museum
Lachish	56	5a-1	7158	Tufnell et al 1953, p. 124, pl. 60:44
Ayanis	21	5a-1	21	Derın & Muscarella 2001, fig. 2

Plate 63

Type 5a-1 (continued)



Lachish 18 Lachish 129 Lachish 310 Lachish 6



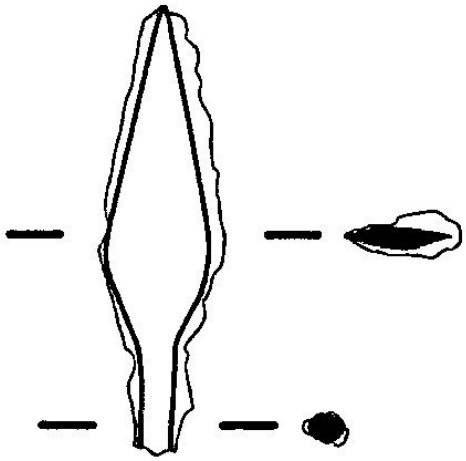
Lachish 322 Ayanis 13 Lachish 26

Sources:

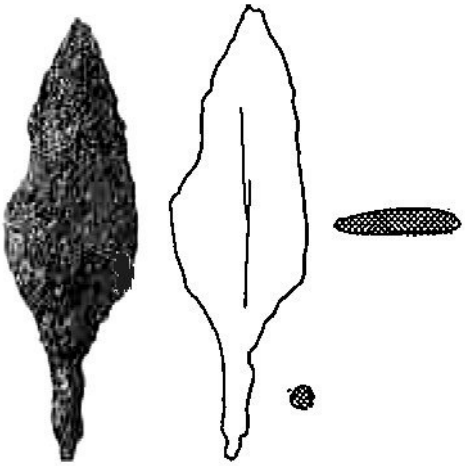
Site	No.	Type	Item No.	Source
Lachish	18	5a-1	5482	Tufnell et al 1953, p. 106-7; pl. 60:6
Lachish	129	5a-1	10869/60	Gottlieb 2004, p. 1919, fig. 27.4:6
Lachish	310	5a-1	61107/60	Gottlieb 2004, p. 1937, fig. 27.13:17
Lachish	6	5a-1	355	Tufnell et al 1953, p. 187, pl. 54:51
Lachish	322	5a-1	61459/60	Gottlieb 2004, p. 1939, fig. 27.14:7
Ayanis	13	5a-1	13	Derın & Muscarella 2001, fig. 2
Lachish	26	5a-1	Pl. 60,14	Tufnell et al 1953, p. 113, pl. 60:14 & Gottlieb 2004, p. 1949, fig. 27.19:7

Plate 64

Type 5a-1 (continued)

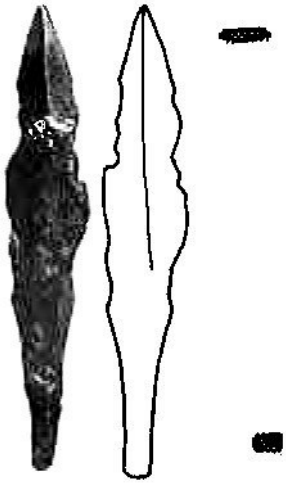


Hasanlu 16

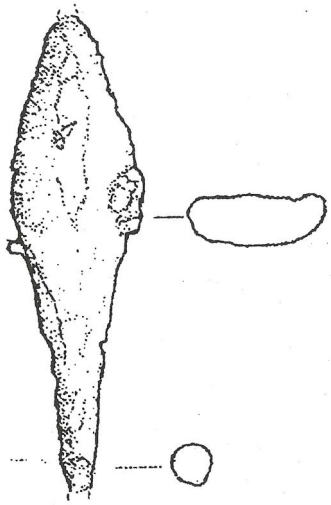


Lachish 313

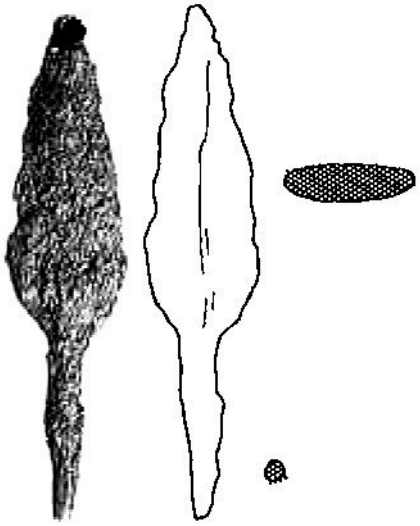
Nimrud 139



Lachish 80



Ayanis 19



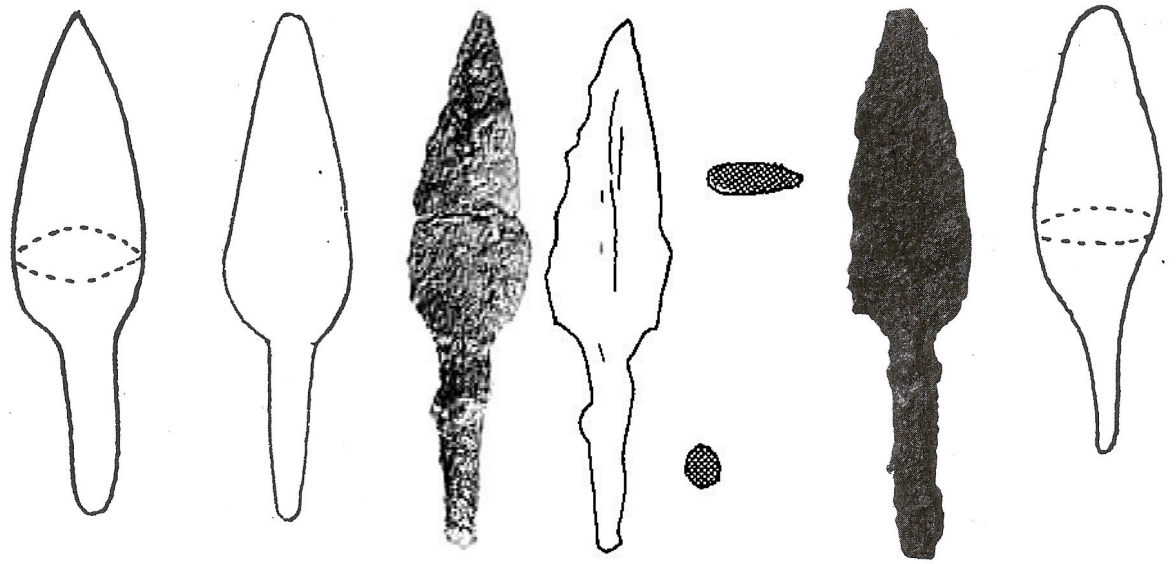
Lachish 325

Sources:

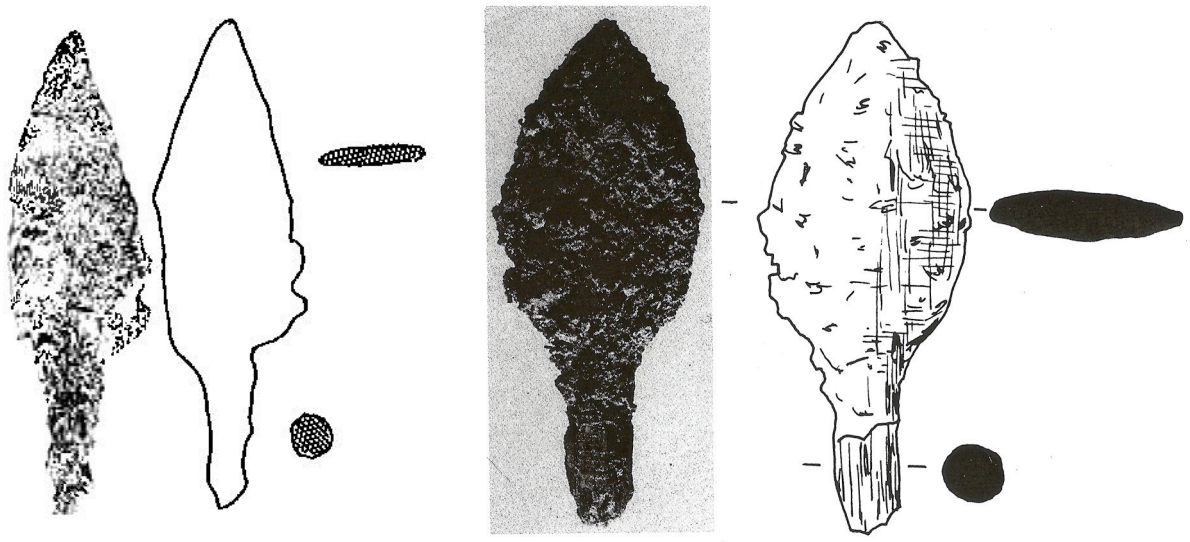
Site	No.	Type	Item No.	Source
Hasanlu	16	5a-1	HAS 72-N136 b	Thornton & Pigott 2011, p. 141, fig. 6.2:16
Lachish	313	5a-1	60689/60	Gottlieb 2004, p. 1937, fig. 27.13:20
Nimrud	139	5a-1	ND 10944	British Museum
Lachish	80	5a-1	8281/60	Gottlieb 2004, p. 1911, fig. 27.1:3
Ayanis	19	5a-1	19	Derın & Muscarella 2001, fig. 2
Lachish	325	5a-1	61792/60	Gottlieb 2004, p. 1939, fig. 27.14:10

Plate 65

Type 5a-1 (continued)



Lachish 13 Gerar 52 Lachish 323 Toprakkale 13 Lachish 54



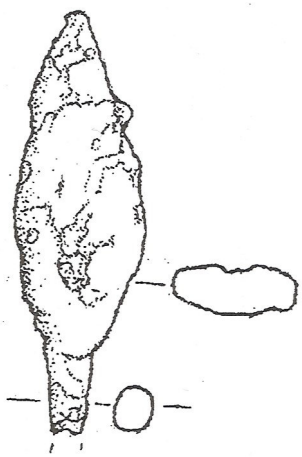
Lachish 34 Uruk 3

Sources:

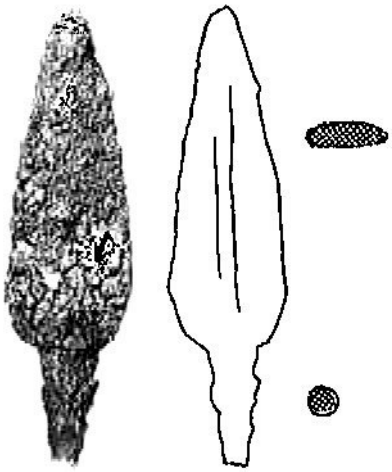
Site	No.	Type	Item No.	Source
Lachish	13	5a-1	5440	Tufnell et al 1953, p. 106; pl. 60:1
Gerar	52	5a-1	pl. 29:37	Petrie 1928, pl. 29:37
Lachish	323	5a-1	61320/60	Gottlieb 2004, p. 1939, fig. 27.14:8
Toprakkale	13	5a-1	333	Wartke 1990, pl. 39:b.4
Lachish	54	5a-1	7141	Tufnell et al 1953, p. 124, pl. 60:42
Lachish	34	5a-1	6786	Gottlieb 2004, p. 1947, fig. 27.18:18
Uruk	3	5a-1	W 21032,1	van Ess & Pedde 1992, p. 67, no. 749

Plate 66

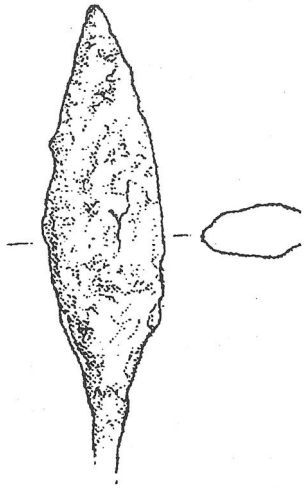
Type 5a-1 (continued)



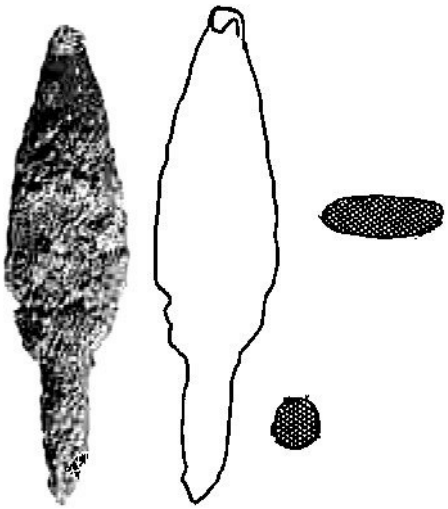
Ayanis 17



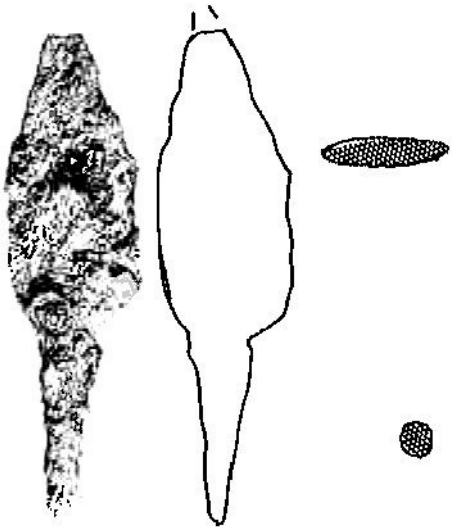
Lachish 329



Ayanis 14



Lachish 308



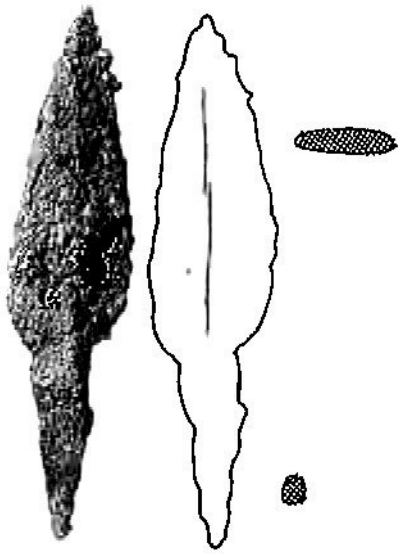
Lachish 31

Sources:

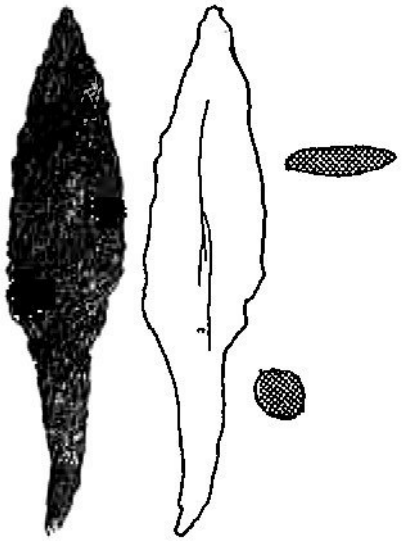
Site	No.	Type	Item No.	Source
Ayanis	17	5a-1	17	Derın & Muscarella 2001, fig. 2
Lachish	329	5a-1	60827/60	Gottlieb 2004, p. 1939, fig. 27.14:14
Ayanis	14	5a-1	14	Derın & Muscarella 2001, fig. 2
Lachish	308	5a-1	62261	Gottlieb 2004, p. 1937, fig. 27.13:15
Lachish	31	5a-1	6292	Tufnell et al 1953, p. 115, pl. 60:19 & Gottlieb 2004, p. 1947, fig. 27.18:16

Plate 67

Type 5a-1 (continued)

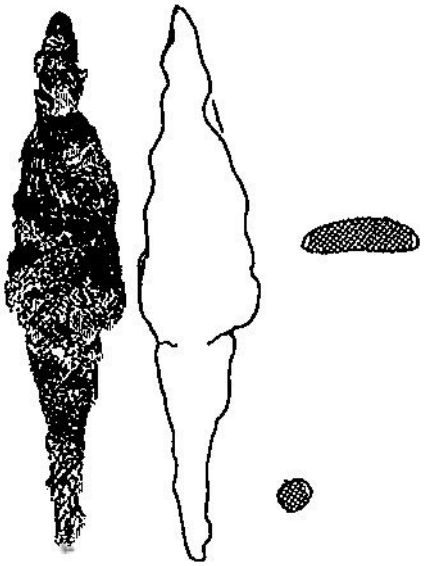


Lachish 269

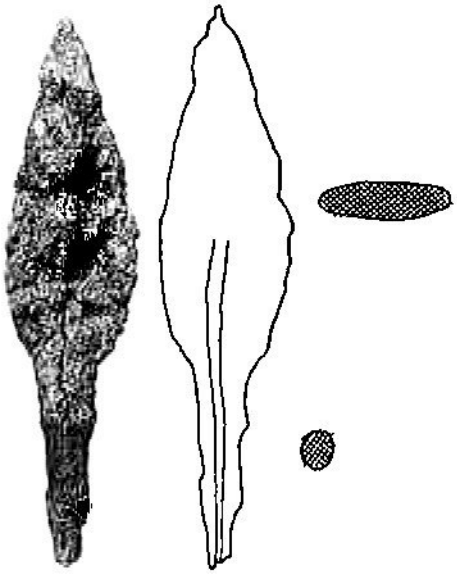


Lachish 274

Lachish 4



Lachish 59

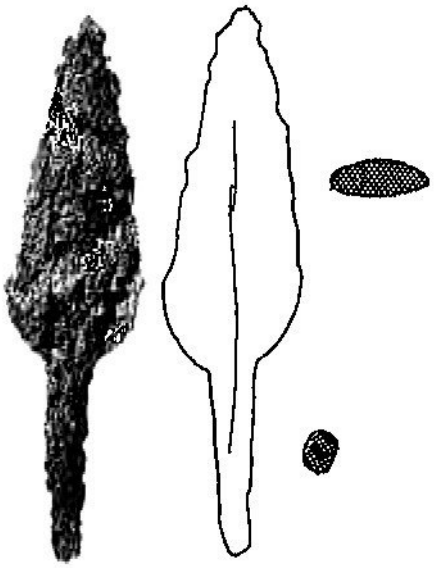


Lachish 324

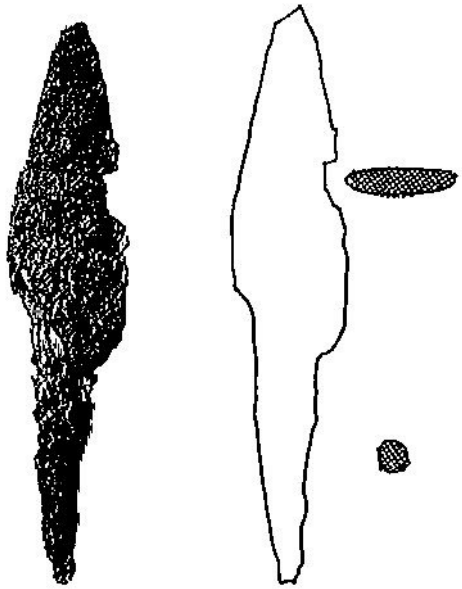
Sources:

Site	No.	Type	Item No.	Source
Lachish	269	5a-1	61558/60	Gottlieb 2004, p. 1933, fig. 27.11:12
Lachish	274	5a-1	61364/60	Gottlieb 2004, p. 1933, fig. 27.11:17
Lachish	4	5a-1	286	Tufnell et al 1953, p. 186, pl. 54:49
Lachish	59	5a-1	7056	Gottlieb 2004, p. 1949, fig. 27.19:14
Lachish	324	5a-1	60801/60	Gottlieb 2004, p. 1939, fig. 27.14:9

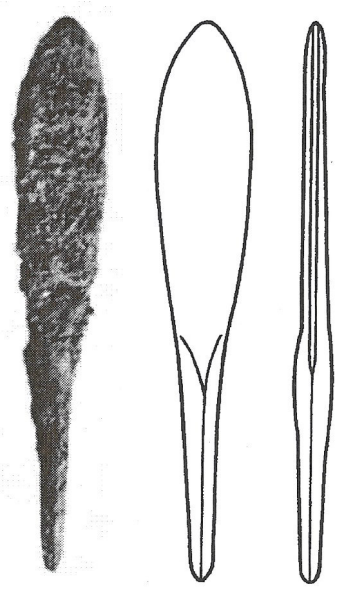
Type 5a-1 (continued)



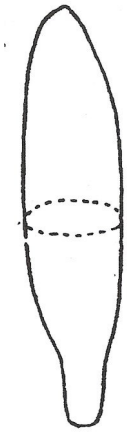
Lachish 303



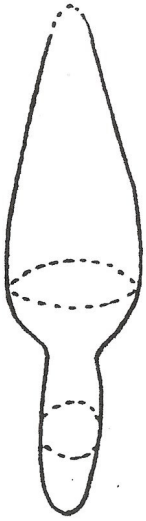
Lachish 321



Fakhariya 15



Lachish 35

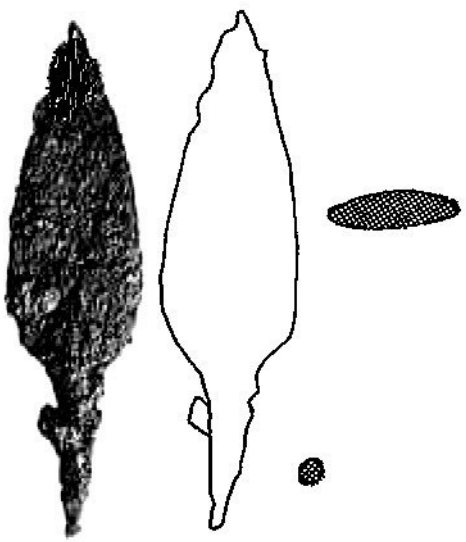


Lachish 23

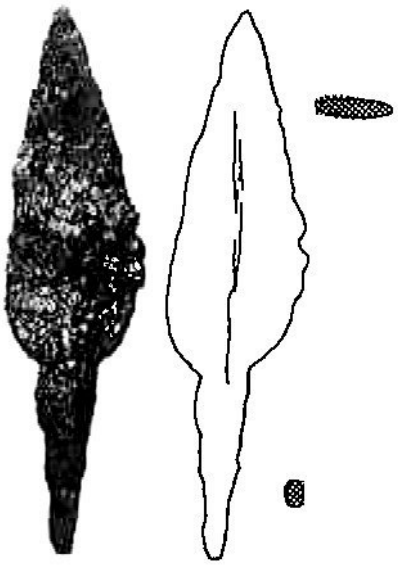
Sources:

Site	No.	Type	Item No.	Source
Lachish	303	5a-1	61930/60	Gottlieb 2004, p. 1937, fig. 27.13:9
Lachish	321	5a-1	61260/60	Gottlieb 2004, p. 1939, fig. 27.14:6
Fakhariya	15	5a-1!	F543	McEwan et al 1957, p. 47, pl. 49:3 & 52:18
Lachish	35	5a-1	6828	Tufnell et al 1953, p. 119, pl. 60:23
Lachish	23	5a-1	6230	Tufnell et al 1953, p. 111, pl. 60:11

Type 5a-1 (continued)



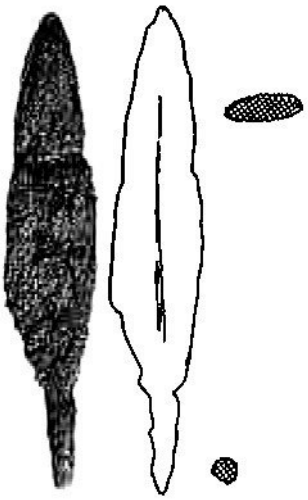
Lachish 305



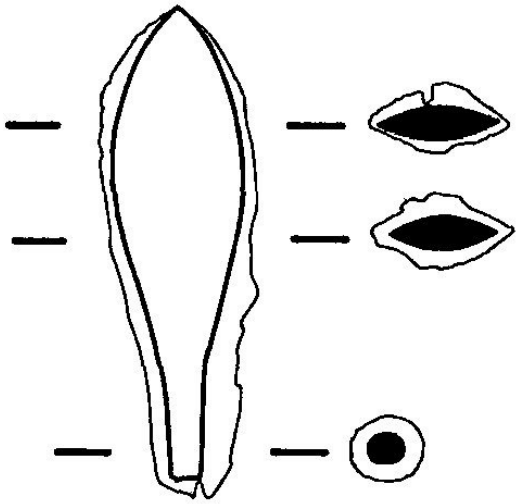
Lachish 272

Sialk 60

Sialk 29



Lachish 341



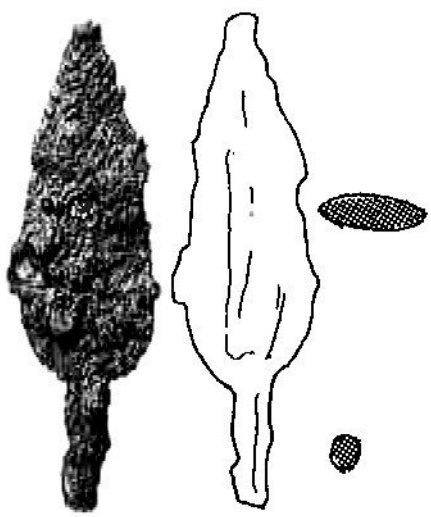
Hasanlu 29

Sources:

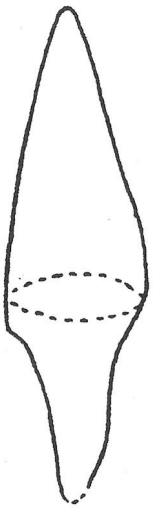
Site	No.	Type	Item No.	Source
Lachish	305	5a-1	61235/60	Gottlieb 2004, p. 1937, fig. 27.13:11
Lachish	272	5a-1	60549/60	Gottlieb 2004, p. 1933, fig. 27.11:15
Sialk	60	5a-1	pl. 92:4	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	29	5a-1	S 642b	Ghirshman 1939, vol. 2, p. 234, pl. 59
Lachish	341	5a-1	61307/60	Gottlieb 2004, p. 1941, fig. 27.15:7
Hasanlu	29	5a-1	HAS 72-N274 h	Thornton & Pigott 2011, p. 142, fig. 6.3:12

Plate 70

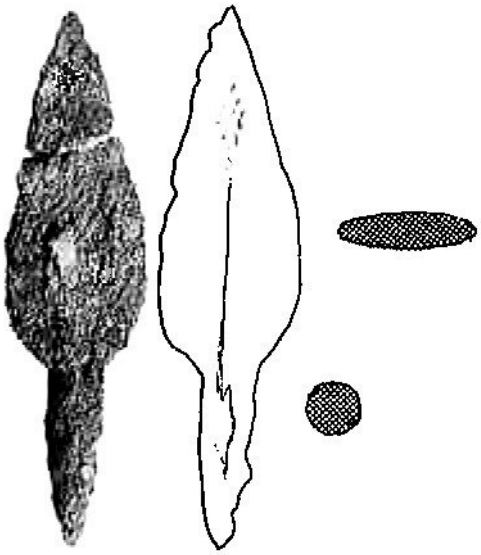
Type 5a-1 (continued)



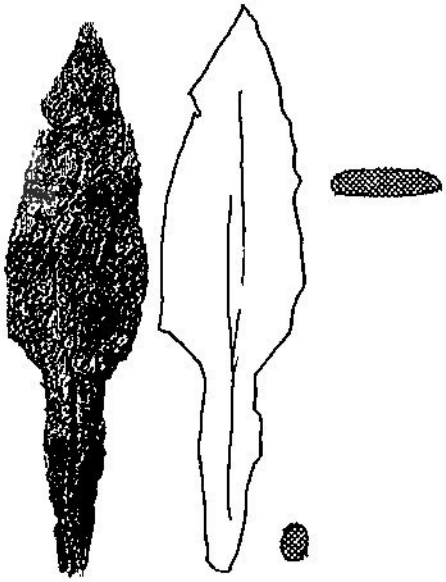
Lachish 306



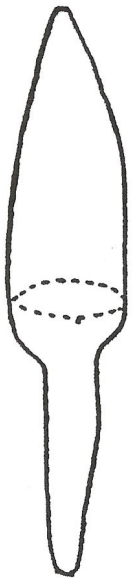
Lachish 22



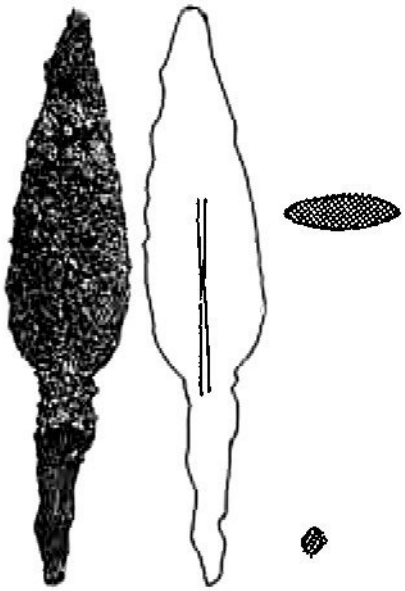
Lachish 254



Lachish 270



Lachish 14

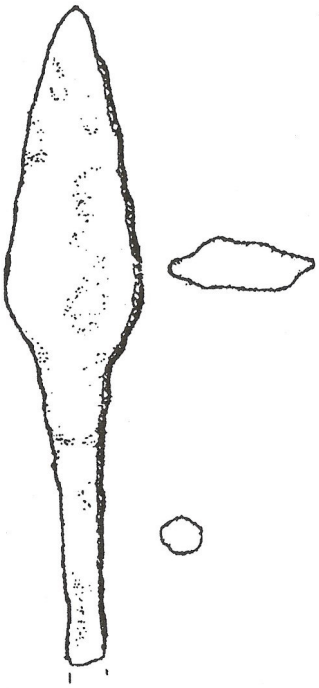


Lachish 255

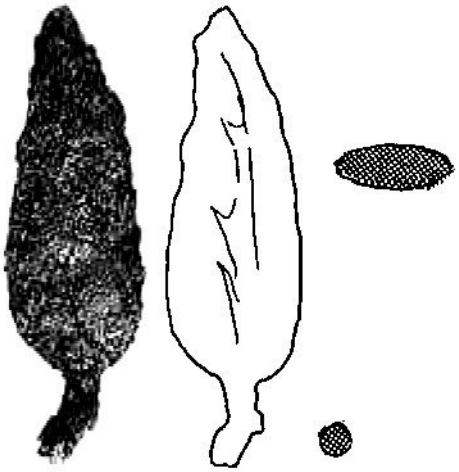
Sources:

Site	No.	Type	Item No.	Source
Lachish	306	5a-1	61754	Gottlieb 2004, p. 1937, fig. 27.13:13
Lachish	22	5a-1	6229	Tufnell et al 1953, p. 111, pl. 60:10
Lachish	254	5a-1	62197/60	Gottlieb 2004, p. 1931, fig. 27.10:15
Lachish	270	5a-1	60776/60	Gottlieb 2004, p. 1933, fig. 27.11:13
Lachish	14	5a-1	5479	Tufnell et al 1953, p. 106-7; pl. 60:2
Lachish	255	5a-1	60480/60	Gottlieb 2004, p. 1931, fig. 27.10:16

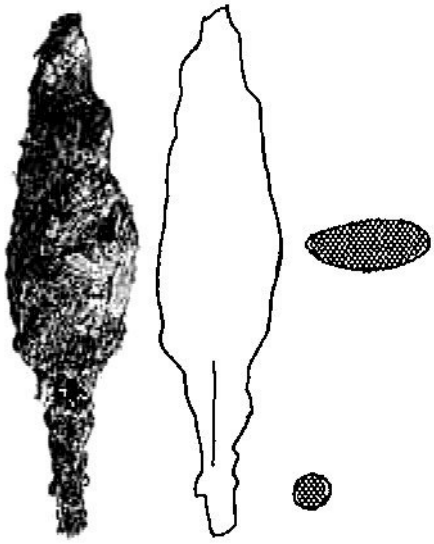
Type 5a-1 (continued)



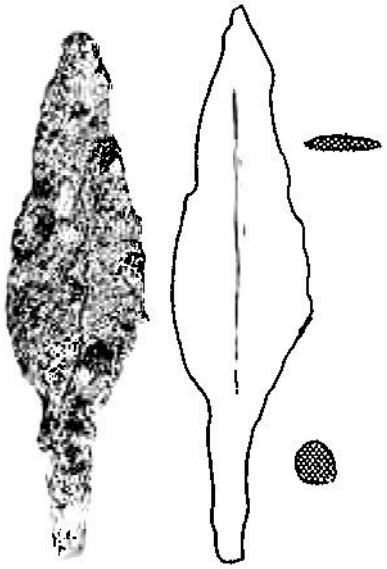
Ayanis 35



Lachish 345



Lachish 24

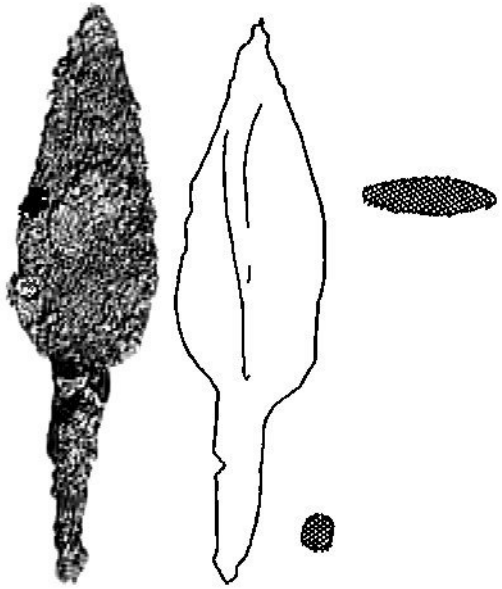


Lachish 363

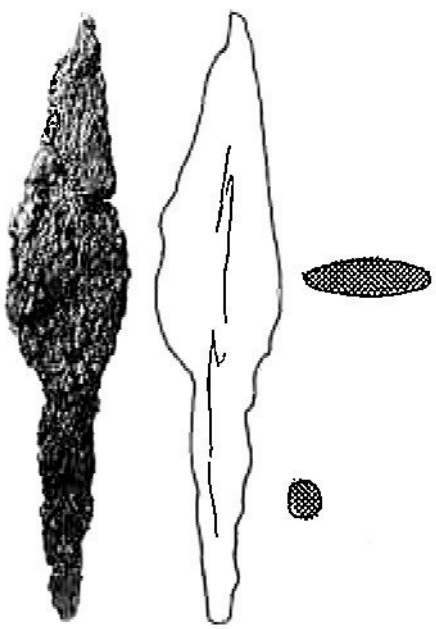
Sources:

Site	No.	Type	Item No.	Source
Ayanis	35	5a-1	35	Derın & Muscarella 2001, fig. 3
Lachish	345	5a-1	61621/60	Gottlieb 2004, p. 1941, fig. 27.15:12
Lachish	24	5a-1	6231	Gottlieb 2004, p. 1945, fig. 27.17:12
Lachish	363	5a-1	5481	Gottlieb 2004, p. 1947, fig. 27.18:12

Type 5a-1 (continued)

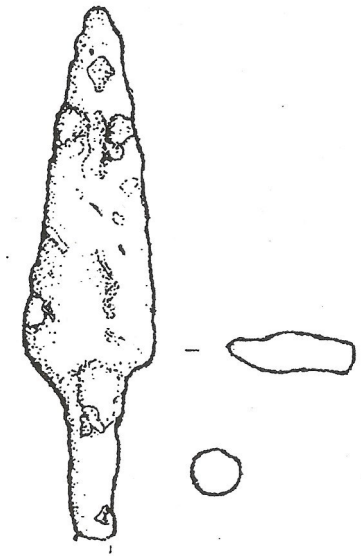


Lachish 273

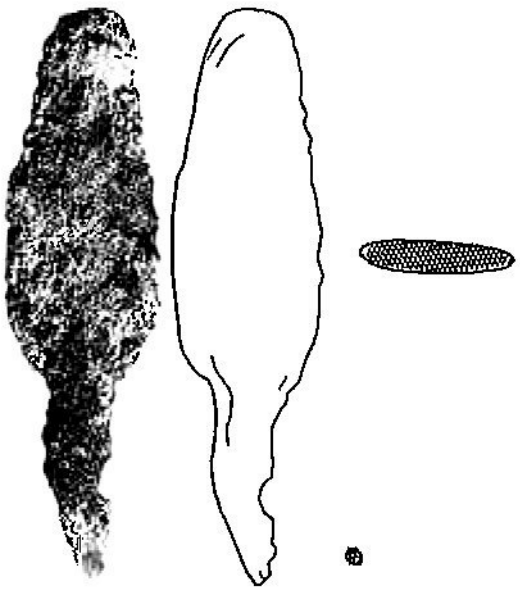


Lachish 264

Gerar 49



Ayanis 38



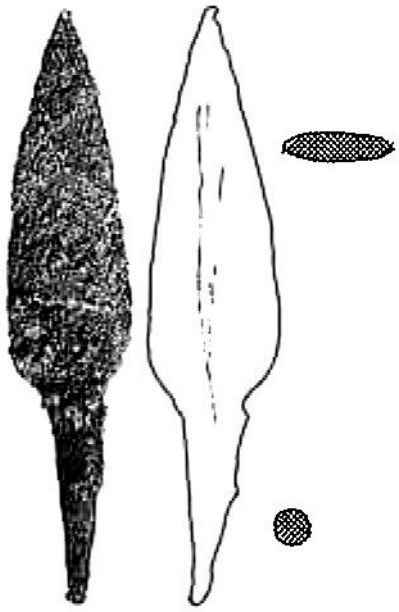
Lachish 53

Sources:

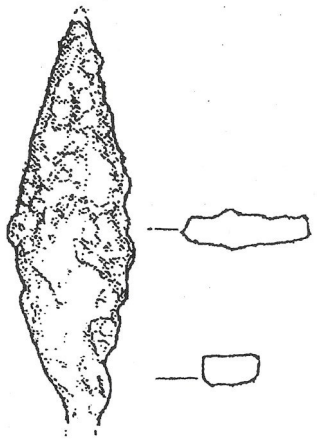
Site	No.	Type	Item No.	Source
Lachish	273	5a-1	61799/60	Gottlieb 2004, p. 1933, fig. 27.11:16
Lachish	264	5a-1	61272/60	Gottlieb 2004, p. 1933, fig. 27.11:7
Gerar	49	5a-1	pl. 29:34	Petrie 1928, pl. 29:34
Ayanis	38	5a-1	38	Derın & Muscarella 2001, fig. 3
Lachish	53	5a-1	7140	Gottlieb 2004, p. 1947, fig. 27.18:10

Plate 73

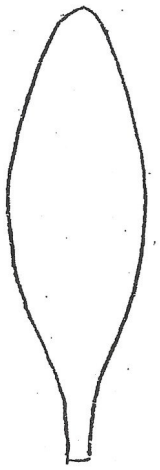
Type 5a-1 (continued)



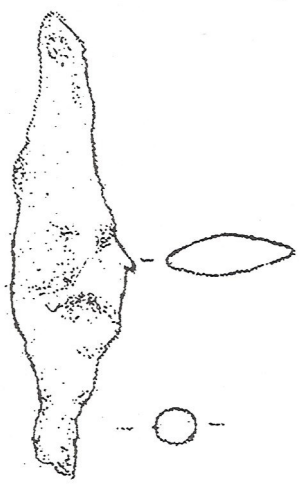
Lachish 256



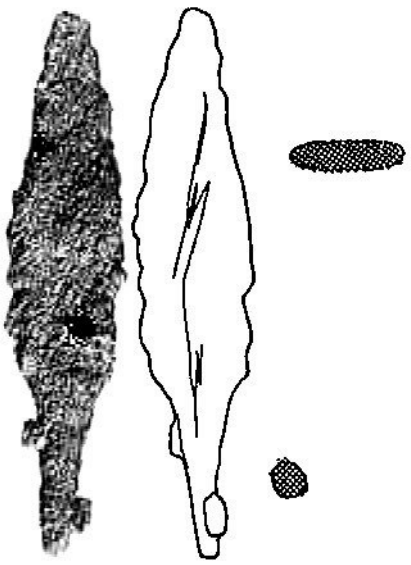
Ayanis 22



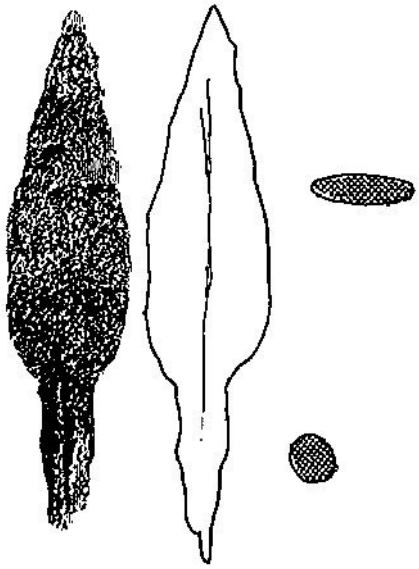
Gerar 48



Ayanis 18



Lachish 188

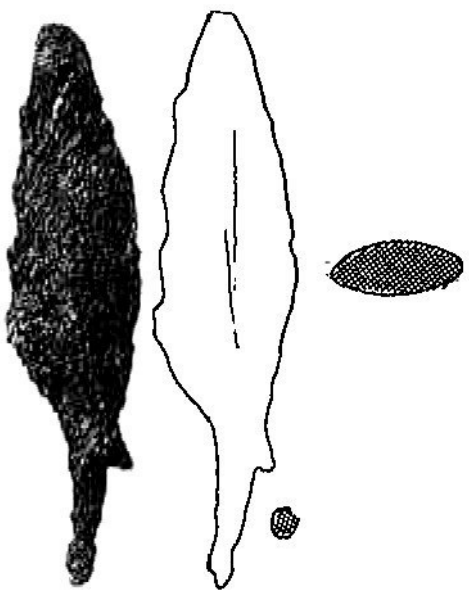


Lachish 330

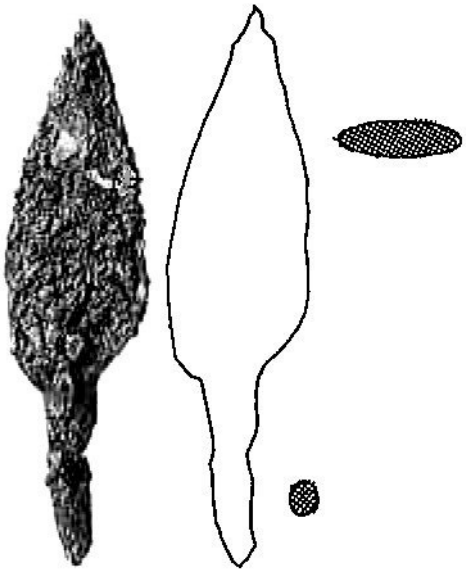
Sources:

Site	No.	Type	Item No.	Source
Lachish	256	5a-1	61255/60	Gottlieb 2004, p. 1931, fig. 27.10:17
Ayanis	22	5a-1	22	Derın & Muscarella 2001, fig. 2
Gerar	48	5a-1	pl. 29:33	Petrie 1928, pl. 29:33
Ayanis	18	5a-1	18	Derın & Muscarella 2001, fig. 2
Lachish	188	5a-1	62232/60	Gottlieb 2004, p. 1925, fig. 27.7:7
Lachish	330	5a-1	60764/60	Gottlieb 2004, p. 1939, fig. 27.14:15

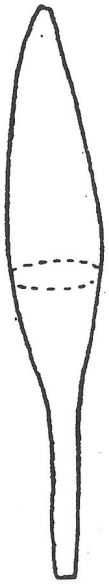
Type 5a-1 (continued)



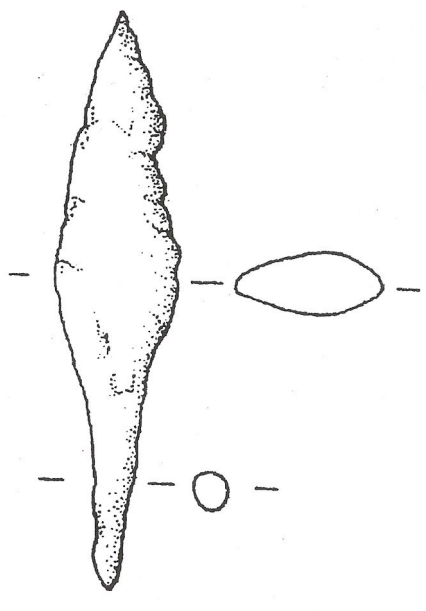
Lachish 234



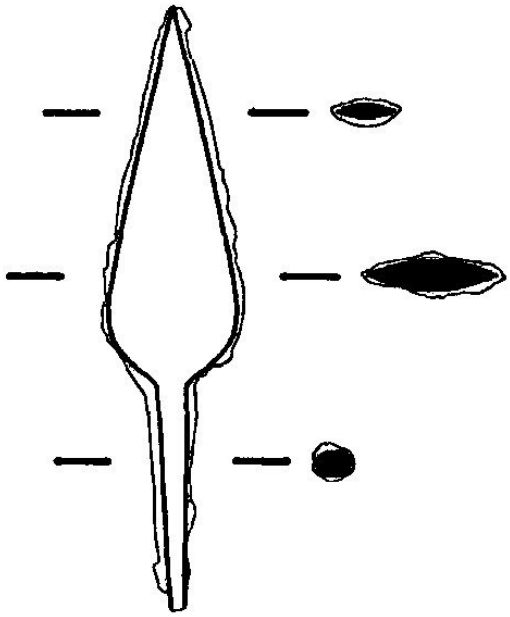
Lachish 271



Lachish 47



Ayanis 23



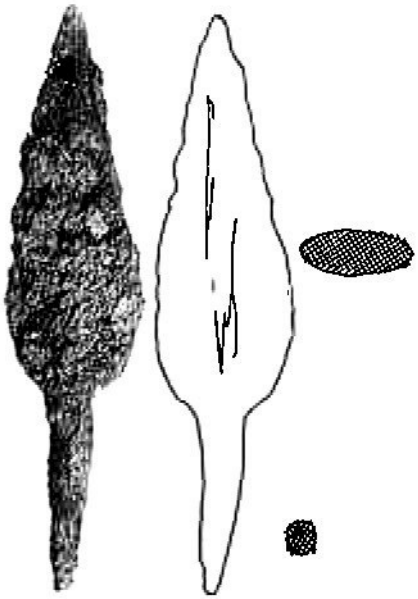
Hasanlu 24

Sources:

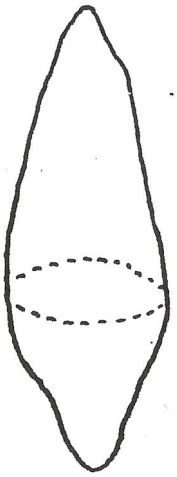
Site	No.	Type	Item No.	Source
Lachish	234	5a-1	61957/60	Gottlieb 2004, p. 1929, fig. 27.9:12
Lachish	271	5a-1	62202/60	Gottlieb 2004, p. 1933, fig. 27.11:14
Lachish	47	5a-1	7129	Tufnell et al 1953, p. 124, pl. 60:35
Ayanis	23	5a-1	23	Derın & Muscarella 2001, fig. 2
Hasanlu	24	5a-1	HAS 64-989 a	Thornton & Pigott 2011, p. 142, fig. 6.3:7

Plate 75

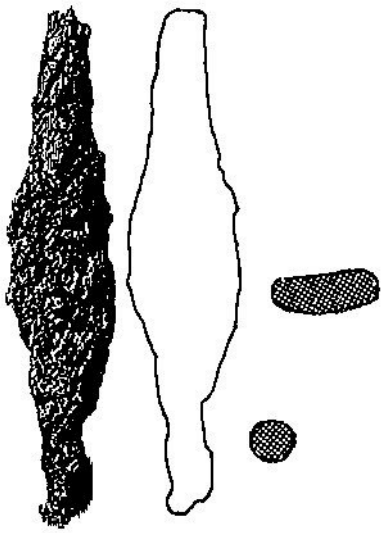
Type 5a-1 (continued)



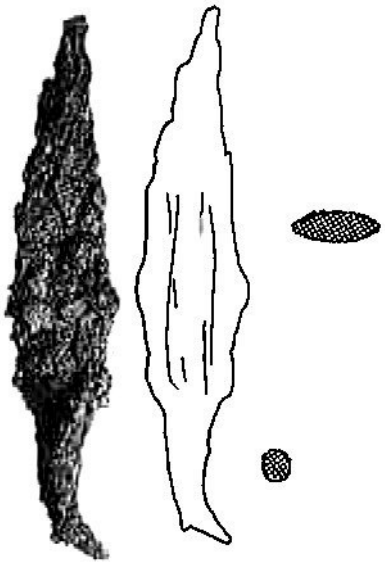
Lachish 235



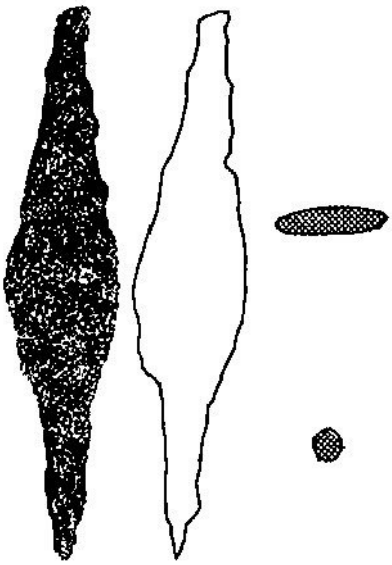
Lachish 40



Lachish 197



Lachish 198



Lachish 194

Sialk 24

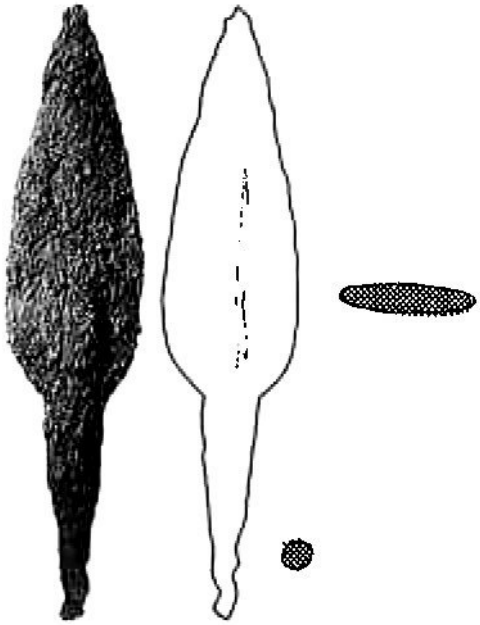
Sources:

Site	No.	Type	Item No.	Source
Lachish	235	5a-1	61308/60	Gottlieb 2004, p. 1929, fig. 27.9:13
Lachish	40	5a-1	7081	Tufnell et al 1953, p. 121-2, pl. 60:28
Lachish	197	5a-1	91738/1	Gottlieb 2004, p. 1925, fig. 27.7:16
Lachish	198	5a-1	61813/60	Gottlieb 2004, p. 1925, fig. 27.7:17
Lachish	194	5a-1	61086/60	Gottlieb 2004, p. 1925, fig. 27.7:13
Sialk	24	5a-1	S 793b, b	Ghirshman 1939, vol. 2, p, 233, pl. 57

Type 5a-1 (continued)

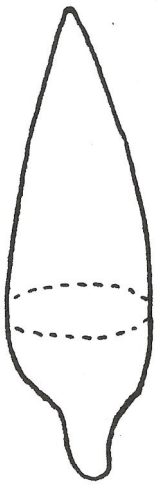
Gerar 63

Gerar 81



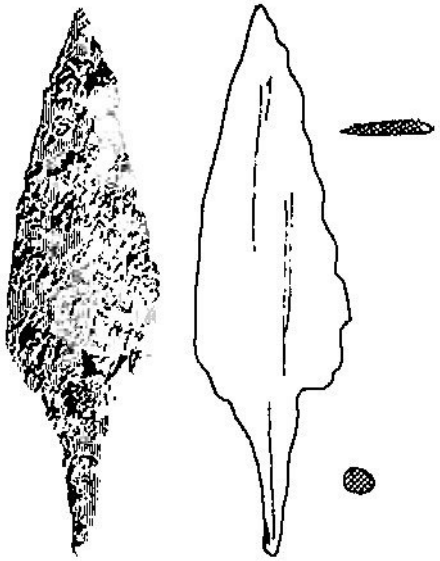
Lachish 257

Sialk 54



Lachish 45

Gerar 45



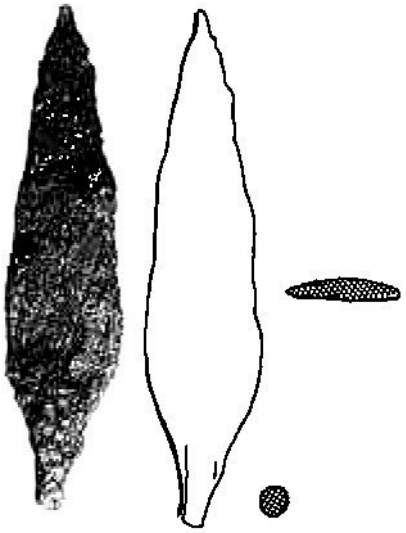
Lachish 16

Sources:

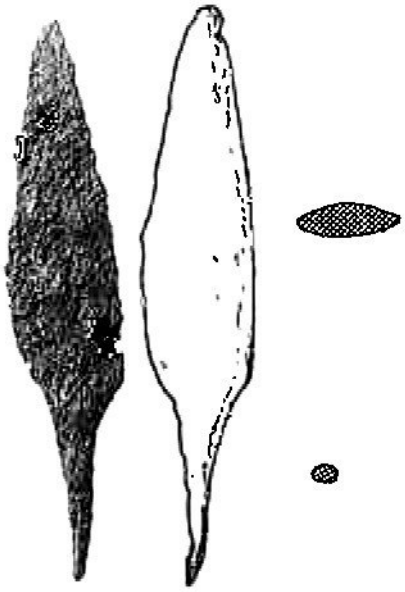
Site	No.	Type	Item No.	Source
Gerar	63	5a-1	pl. 29:48	Petrie 1928, pl. 29:48
Gerar	81	5a-1	pl. 29:66	Petrie 1928, pl. 29:66
Lachish	257	5a-1	60610/60	Gottlieb 2004, p. 1931, fig. 27.10:18
Sialk	54	5a-1	S 973a, d	Ghirshman 1939, vol. 2, p. 244, pl. 77
Lachish	45	5a-1	7114	Tufnell et al 1953, p. 123, pl. 60:33
Gerar	45	5a-1	pl. 29:30	Petrie 1928, pl. 29:30
Lachish	16	5a-1	5481	Gottlieb 2004, p. 1947, fig. 27.18:7

Type 5a-1 (continued)

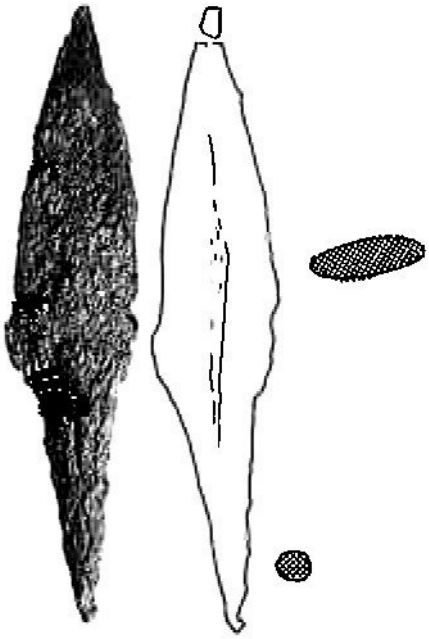
Gerar 62



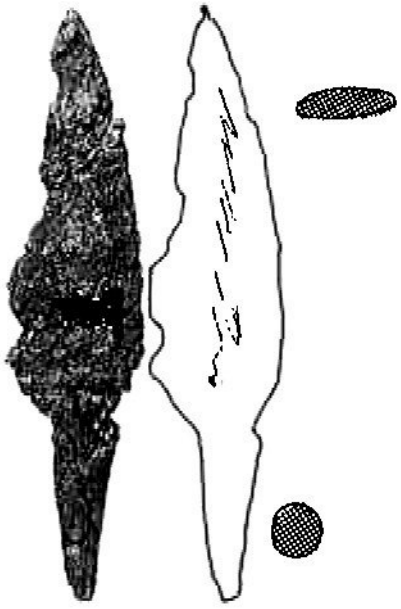
Lachish 212



Lachish 132



Lachish 240



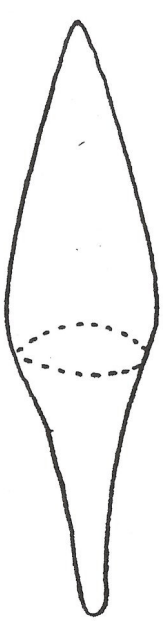
Lachish 241

Sialk 30

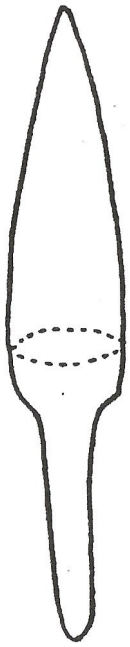
Sources:

Site	No.	Type	Item No.	Source
Gerar	62	5a-1	pl. 29:47	Petrie 1928, pl. 29:47
Lachish	212	5a-1	60753/60	Gottlieb 2004, p. 1927, fig. 27.8:11
Lachish	132	5a-1	31433/60	Gottlieb 2004, p. 1919, fig. 27.4:9
Lachish	240	5a-1	61042/60	Gottlieb 2004, p. 1931, fig. 27.10:1
Lachish	241	5a-1	60712/60	Gottlieb 2004, p. 1931, fig. 27.10:2
Sialk	30	5a-1	S 764, a	Ghirshman 1939, vol. 2, p. 235, pl. 62

Type 5a-1 (continued)

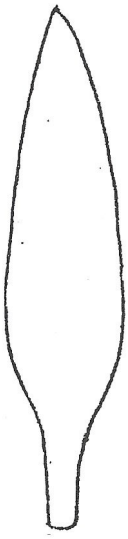


Lachish 30

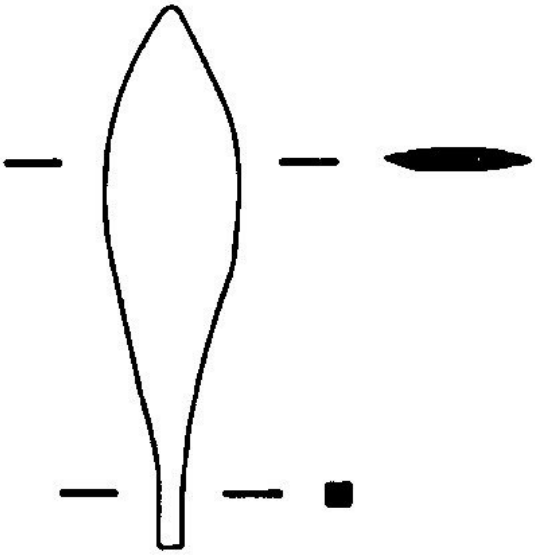


Lachish 15

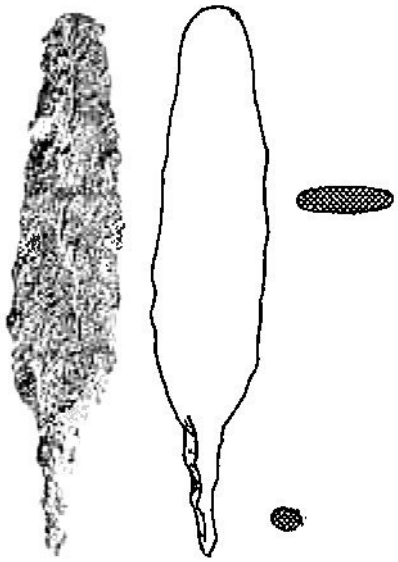
Sialk 15



Gerar 83



Hasanlu 57



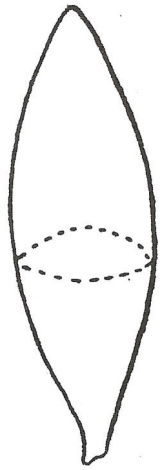
Lachish 370

Sultantepe 2

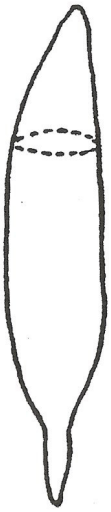
Sources:

Site	No.	Type	Item No.	Source
Lachish	30	5a-1	6290	Tufnell et al 1953, p. 115, pl. 60:18
Lachish	15	5a-1	5480	Tufnell et al 1953, p. 106-7; pl. 60:3
Sialk	15	5a-1	S 547c, h	Ghirshman 1939, vol. 2, p. 229; pl. 50
Gerar	83	5a-1	pl. 29:68	Petrie 1928, pl. 29:68
Hasanlu	57	5a-1	HAS 60-871 b	Thornton & Pigott 2011, p. 145, fig. 6.6:10
Lachish	370	5a-1	5480	Gottlieb 2004, p. 1949, fig. 27.19:19
Sultantepe	2	5a-1	Fig. 6:3	Lloyd 1954, p. 107, 109; Fig. 6

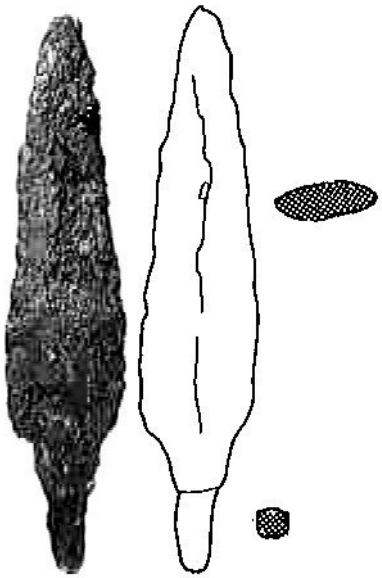
Type 5a-1 (continued)



Lachish 27



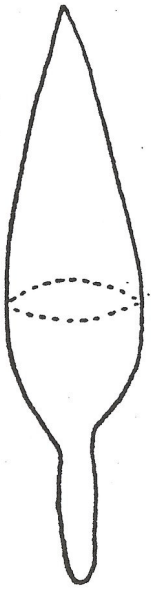
Lachish 5



Lachish 189

Lachish 9

Gerar 47



Lachish 64

Sialk 31

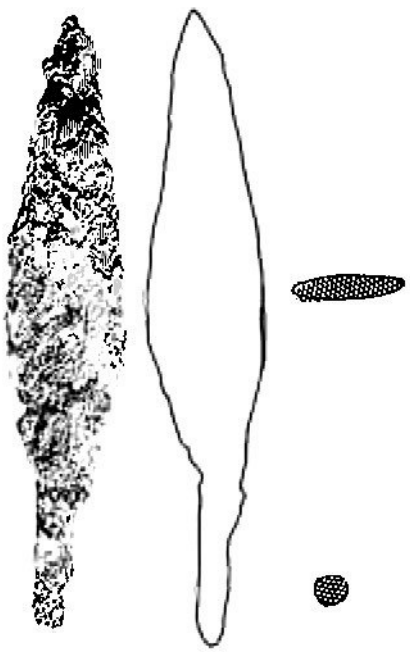
Sialk 39

Sources:

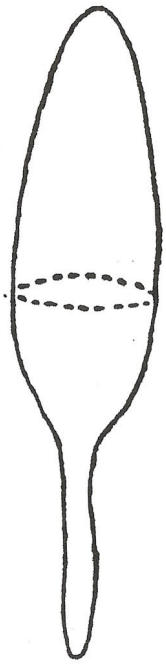
Site	No.	Type	Item No.	Source
Lachish	27	5a-1	6261	Tufnell et al 1953, p. 114, pl. 60:15
Lachish	5	5a-1	288	Tufnell et al 1953, p. 186, pl. 54:50
Lachish	189	5a-1	60623/60	Gottlieb 2004, p. 1925, fig. 27.7:8
Lachish	9	5a-1	5144	Tufnell et al 1953, p. 196, pl. 55:12
Gerar	47	5a-1	pl. 29:32	Petrie 1928, pl. 29:32
Lachish	64	5a-1	7059	Tufnell et al 1953, p. 121, pl. 60:64
Sialk	31	5a-1	S 764, b	Ghirshman 1939, vol. 2, p. 235, pl. 62
Sialk	39	5a-1	S 892e, c	Ghirshman 1939, vol. 2, p. 242, pl. 71

Plate 80

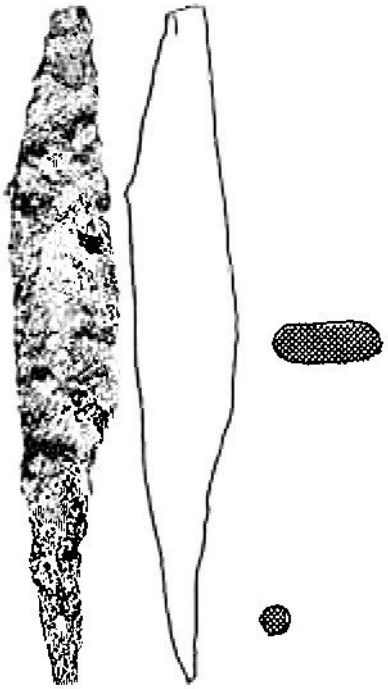
Type 5a-1 (continued)



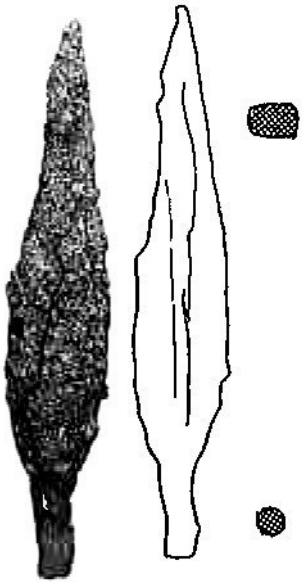
Lachish 360



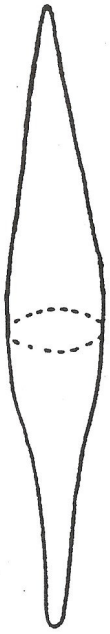
Lachish 2



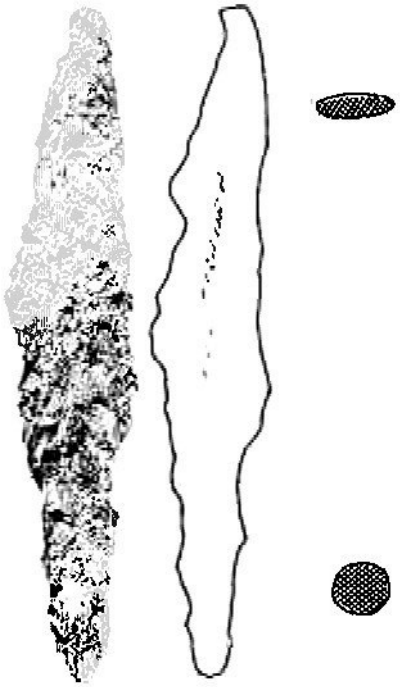
Lachish 357



Lachish 195



Lachish 60



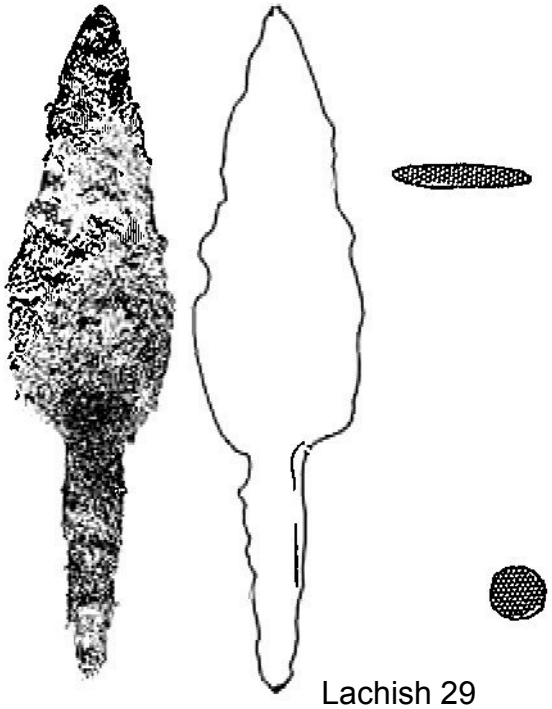
Lachish 356

Sources:

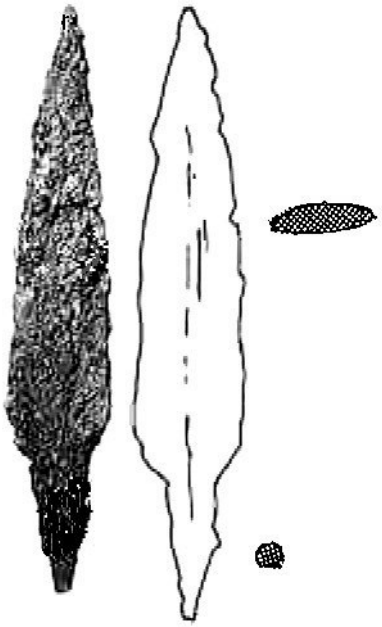
Site	No.	Type	Item No.	Source
Lachish	360	5a-1	5480	Gottlieb 2004, p. 1945, fig. 27.17:18
Lachish	2	5a-1	285	Tufnell et al 1953, p. 186, pl. 54:47
Lachish	357	5a-1	7057(?)	Gottlieb 2004, p. 1945, fig. 27.17:5
Lachish	195	5a-1	60740/60	Gottlieb 2004, p. 1925, fig. 27.7:14
Lachish	60	5a-1	7057	Tufnell et al 1953, p. 121, pl. 60:50
Lachish	356	5a-1	7060	Gottlieb 2004, p. 1945, fig. 27.17:3

Plate 81

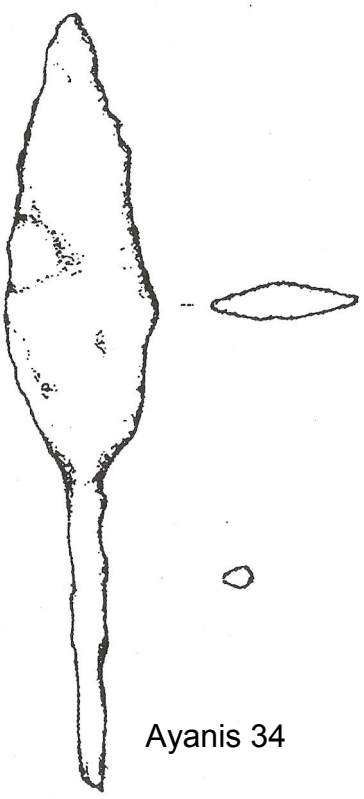
Type 5a-1 (continued)



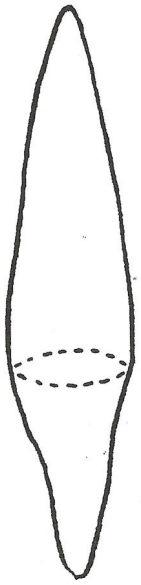
Lachish 29



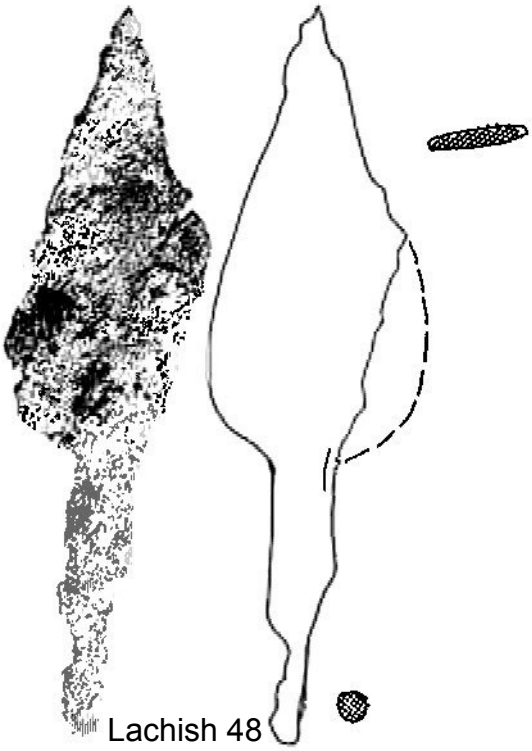
Lachish 190



Ayanis 34



Lachish 51

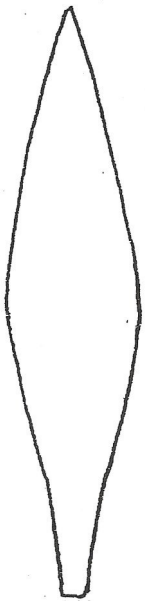


Lachish 48

Sources:

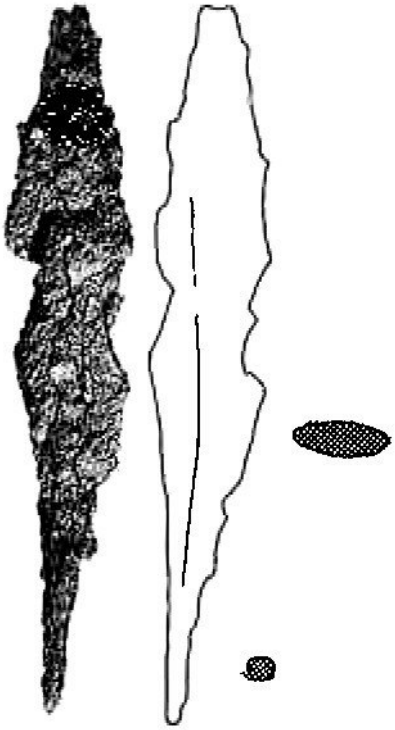
Site	No.	Type	Item No.	Source
Lachish	29	5a-1	6289	Gottlieb 2004, p. 1947, fig. 27.18:1
Lachish	190	5a-1	61807/60	Gottlieb 2004, p. 1925, fig. 27.7:9
Ayanis	34	5a-1	34	Derın & Muscarella 2001, fig. 3
Lachish	51	5a-1	7139	Tufnell et al 1953, p. 124, pl. 60:39
Lachish	48	5a-1	7132	Gottlieb 2004, p. 1947, fig. 27.18:2

Type 5a-1 (continued)

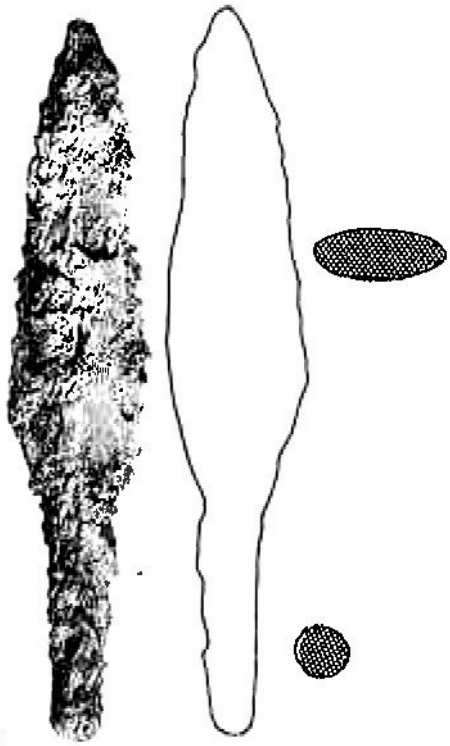


Gerar 46

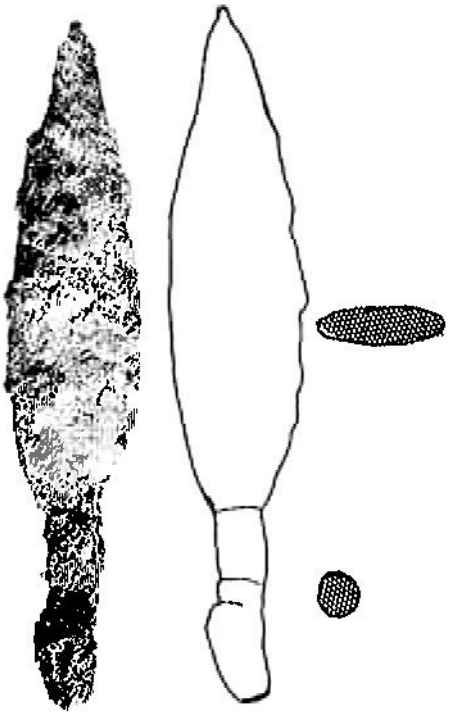
Sialk 37



Lachish 147



Lachish 43

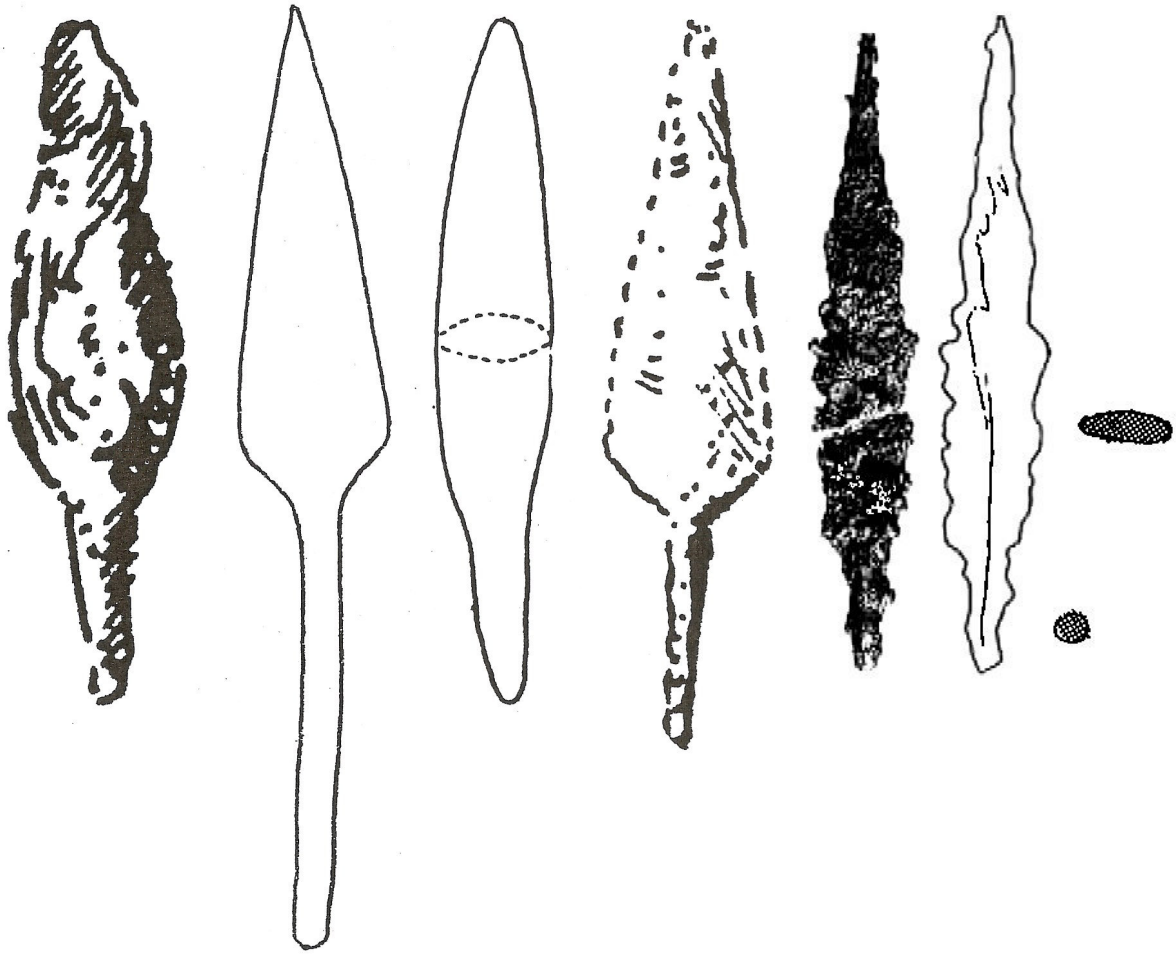


Lachish 55

Sialk 13

Sources: see Plate 83

Type 5a-1 (continued)



Sialk 14 Gerar 7 Lachish 63 Sialk 23 Lachish 173

Sources for Plate 82:

Site	No.	Type	Item No.	Source
Gerar	46	5a-1	pl. 29:31	Petrie 1928, pl. 29:31
Sialk	37	5a-1	S 892e, a	Ghirshman 1939, vol. 2, p. 242, pl. 71
Lachish	147	5a-1	61816/60	Gottlieb 2004, p. 1921, fig. 27.5:5
Lachish	43	5a-1	7107	Gottlieb 2004, p. 1943, fig. 27.16:15
Lachish	55	5a-1	7157	Gottlieb 2004, p. 1943, fig. 27.16:14
Sialk	13	5a-1	S 547c, f	Ghirshman 1939, vol. 2, p. 229; pl. 50

Sources for Plate 83:

Sialk	14	5a-1	S 547c, g	Ghirshman 1939, vol. 2, p. 229; pl. 50
Gerar	7	5a-1	pl. 28:05	Petrie 1928, pl. 28:05
Lachish	63	5a-1	7060	Tufnell et al 1953, p. 121, pl. 60:63
Sialk	23	5a-1	S 793b, a	Ghirshman 1939, vol. 2, p, 233, pl. 57
Lachish	173	5a-1	61929/60	Gottlieb 2004, p. 1923, fig. 27.6:12

Type 5a-1 (continued)

Gerar 40

Sialk 40

Gerar 41

Sialk 44

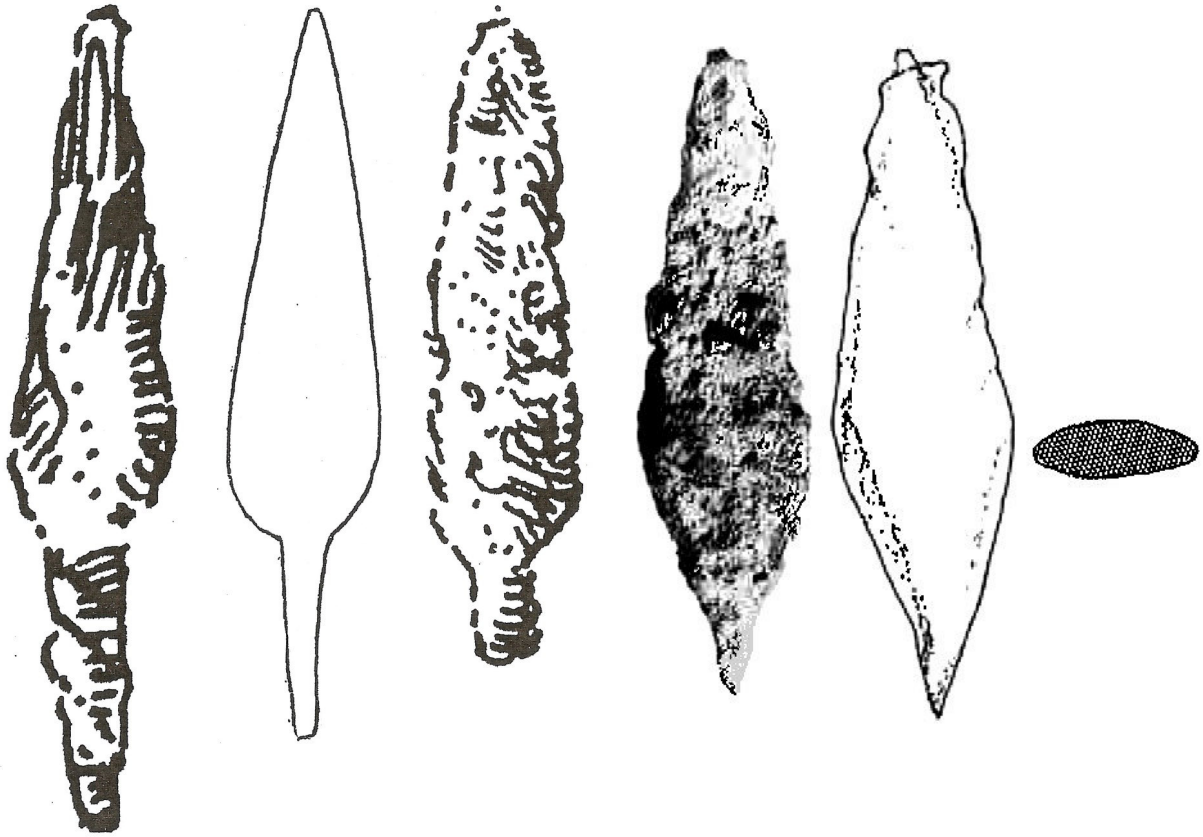
Sources:

Site	No.	Type	Item No.	Source
Gerar	40	5a-1	pl. 29:25	Petrie 1928, pl. 29:25
Sialk	40	5a-1	S 892e, d	Ghirshman 1939, vol. 2, p. 242, pl. 71
Gerar	41	5a-1	pl. 29:26	Petrie 1928, pl. 29:26
Sialk	44	5a-1	S 923c, a	Ghirshman 1939, vol. 2, p. 244, pl. 75

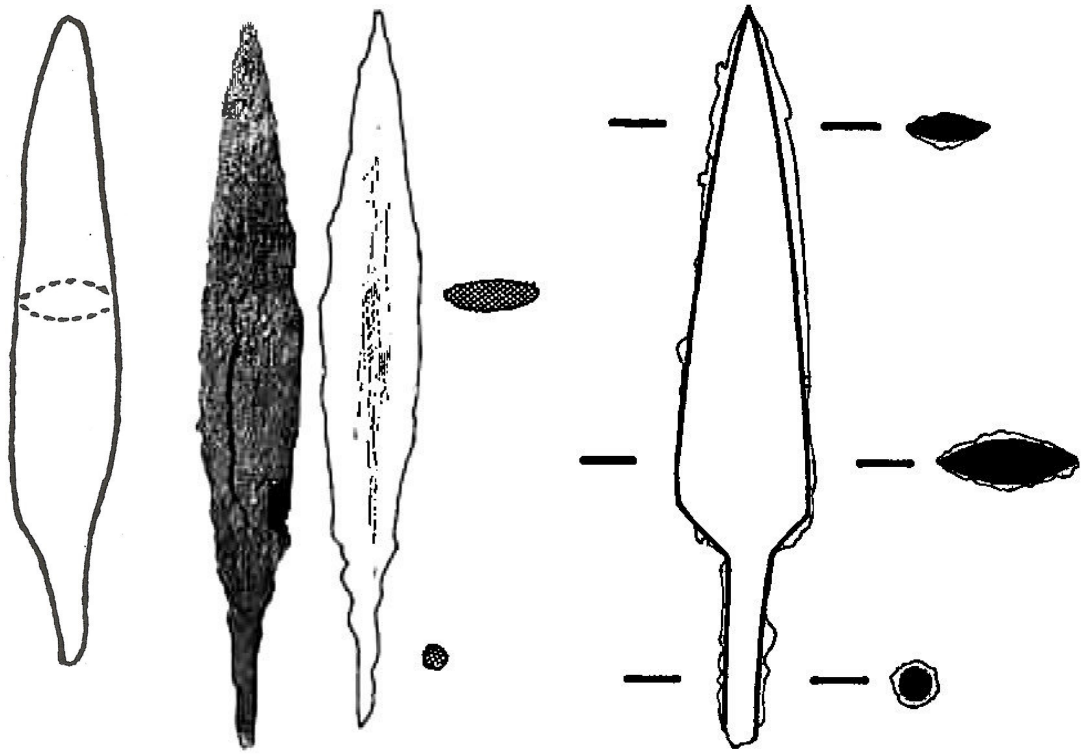
Sources for Plate 85:

Sialk	12	5a-1	S 547c, e	Ghirshman 1939, vol. 2, p. 229; pl. 50
Gerar	53	5a-1	pl. 29:38	Petrie 1928, pl. 29:38
Sialk	28	5a-1	S 642a	Ghirshman 1939, vol. 2, p. 234, pl. 59
Lachish	61	5a-1	7055	Gottlieb 2004, p. 1943, fig. 27.16:16
Lachish	1	5a-1	338	Tufnell et al 1953, p. 186, pl. 54:46
Lachish	103	5a-1	39020/60	Gottlieb 2004, p. 1915, fig. 27.2:13
Hasanlu	4	5a-1	HAS 60-809 k1	Thornton & Pigott 2011, p. 141, fig. 6.2:4

Type 5a-1 (continued)



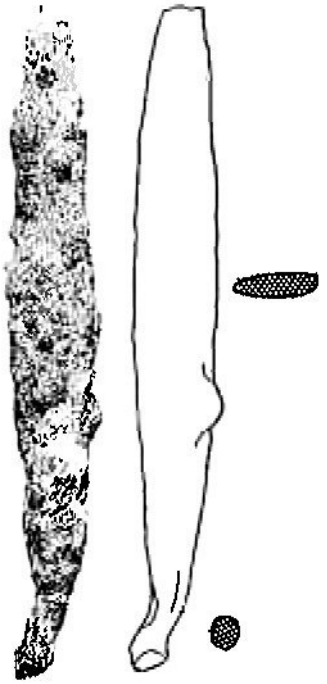
Sialk 12 Gerar 53 Sialk 28 Lachish 61



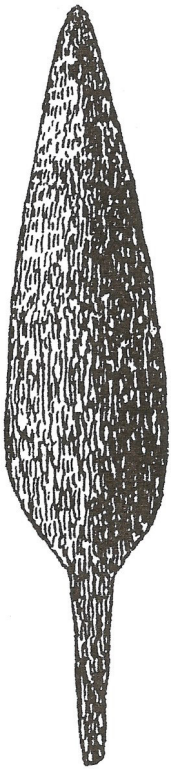
Lachish 1 Lachish 103 Hasanlu 4

Sources: see Plate 84

Type 5a-1 (continued)



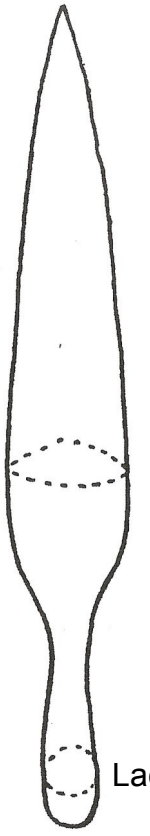
Lachish 353



Sialk 57

Sialk 10

Sialk 11

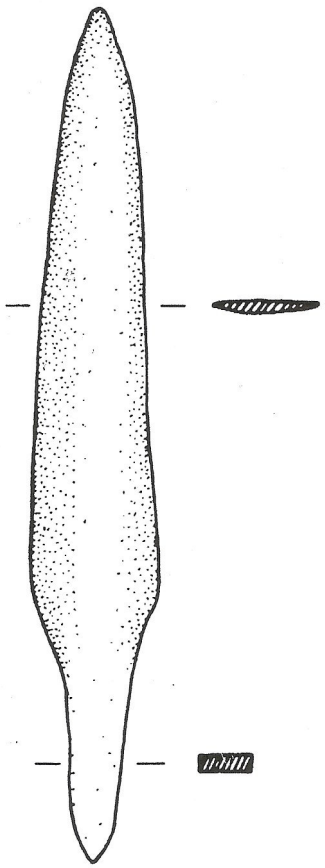


Lachish 28

Lachish 52

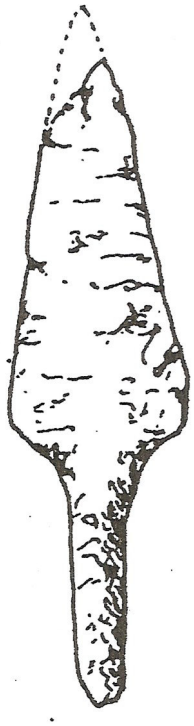
Sources: see Plate 87

Type 5a-1 (continued)



Nush-i Jan 11

Sialk 8



Carchemish 40
(scale unknown)

Sources for Plate 86:

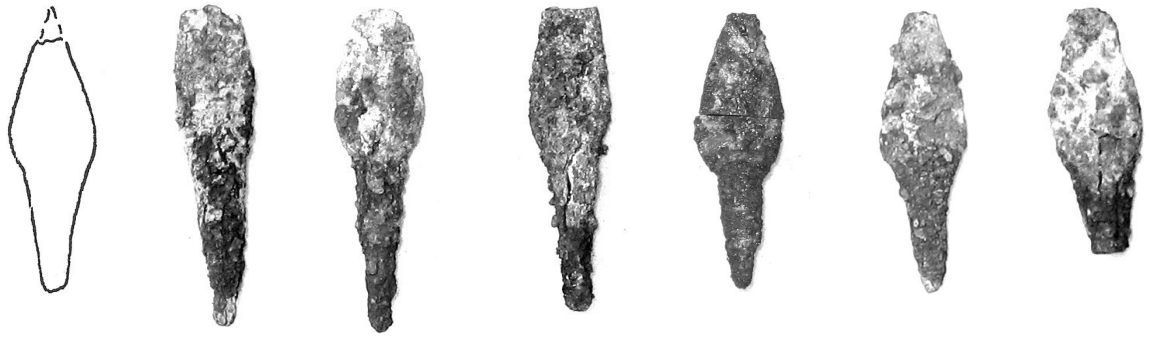
Site	No.	Type	Item No.	Source
Lachish	353	5a-1	7139A	Gottlieb 2004, p. 1943, fig. 27.16:11
Sialk	57	5a-1	pl. 92:1	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	10	5a-1	S 547c, c	Ghirshman 1939, vol. 2, p. 229; pl. 50
Sialk	11	5a-1	S 547c, d	Ghirshman 1939, vol. 2, p. 229; pl. 50
Lachish	28	5a-1	6291	Tufnell et al 1953, p. 115, pl. 60:16
Lachish	52	5a-1	7139a	Tufnell et al 1953, p. 124, pl. 60:40

Sources for Plate 87:

Nush-i Jan	11	5a-1!	NU 73/37	Curtis 1984, p. 27, fig 6:258
Sialk	8	5a-1	S 547c, a	Ghirshman 1939, vol. 2, p. 229; pl. 50
Carchemish	40	5a-1	Fig. 20,c	Wooley 1921, Fig. 20,c

Plate 88

Type 5a-1 (continued)



Gerar 3 Nimrud 219 Nimrud 249 Nimrud 195
Nimrud 205 Nimrud 127 Nimrud 65

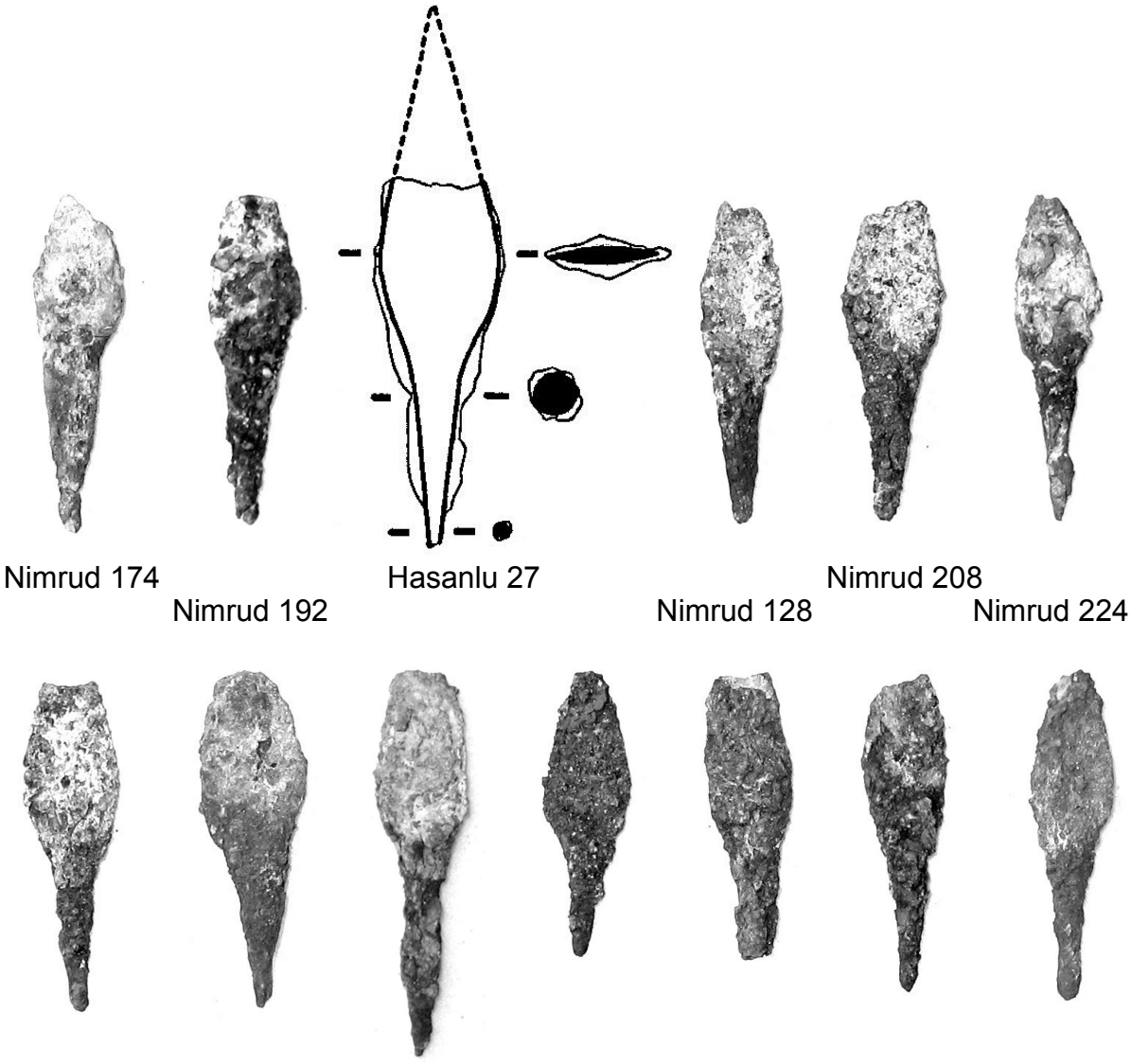
Nimrud 216 Nimrud 189 Nimrud 107 Nimrud 79
Nimrud 75 Nimrud 131 Nimrud 61

Sources:

Site	No.	Type	Item No.	Source
Gerar	3	5a-1	pl. 23:27	Petrie 1928, pl. 23:27
Nimrud	205	5a-1	ND 10944	British Museum
Nimrud	219	5a-1	ND 10944	British Museum
Nimrud	127	5a-1	ND 10944	British Museum
Nimrud	249	5a-1	ND 7534	British Museum
Nimrud	65	5a-1	ND 10944	British Museum
Nimrud	195	5a-1	ND 10944	British Museum
Nimrud	216	5a-1	ND 10944	British Museum
Nimrud	75	5a-1	ND 10944	British Museum
Nimrud	189	5a-1	ND 10944	British Museum
Nimrud	131	5a-1	ND 10944	British Museum
Nimrud	107	5a-1	ND 10944	British Museum
Nimrud	61	5a-1	ND 10944	British Museum
Nimrud	79	5a-1	ND 10944	British Museum

Plate 89

Type 5a-1 (continued)



Nimrud 174 Nimrud 192 Hasanlu 27 Nimrud 208 Nimrud 128 Nimrud 224

Nimrud 204 Nimrud 158 Nimrud 81 Nimrud 213 Nimrud 203 Nimrud 223 Nimrud 103

Sources:

Site	No.	Type	Item No.	Source
Nimrud	174	5a-1	ND 10944	British Museum
Nimrud	192	5a-1	ND 10944	British Museum
Hasanlu	27	5a-1	HAS 70-345	Thornton & Pigott 2011, p. 142, fig. 6.3:10
Nimrud	128	5a-1	ND 10944	British Museum
Nimrud	208	5a-1	ND 10944	British Museum
Nimrud	224	5a-1	ND 10944	British Museum
Nimrud	204	5a-1	ND 10944	British Museum
Nimrud	158	5a-1	ND 10944	British Museum
Nimrud	81	5a-1	ND 10944	British Museum
Nimrud	213	5a-1	ND 10944	British Museum
Nimrud	203	5a-1	ND 10944	British Museum
Nimrud	223	5a-1	ND 10944	British Museum
Nimrud	103	5a-1	ND 10944	British Museum

Type 5a-1 (continued)

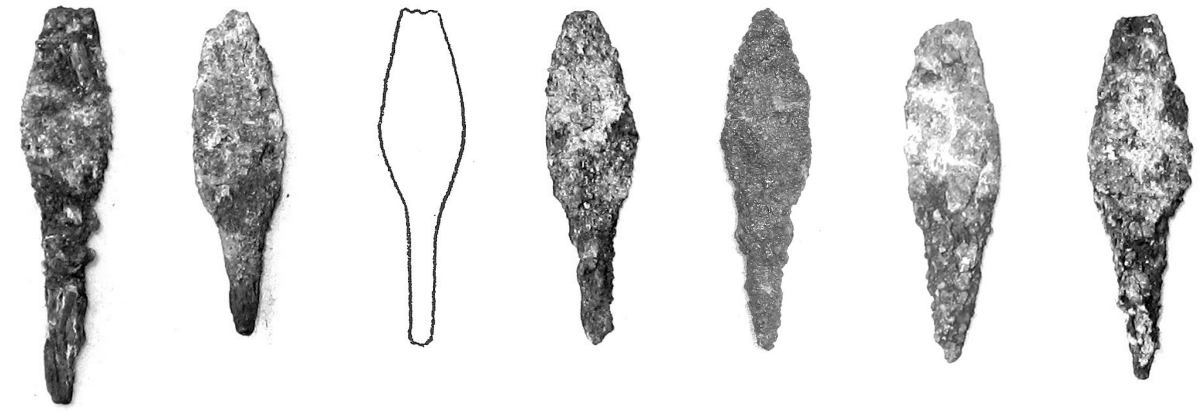
Nimrud 227 Nimrud 154 Nimrud 101 Nimrud 82
Nimrud 47 Nimrud 121 Nimrud 104

Nimrud 202 Nimrud 159 Nimrud 229 Nimrud 48
Nimrud 147 Nimrud 119 Nimrud 247

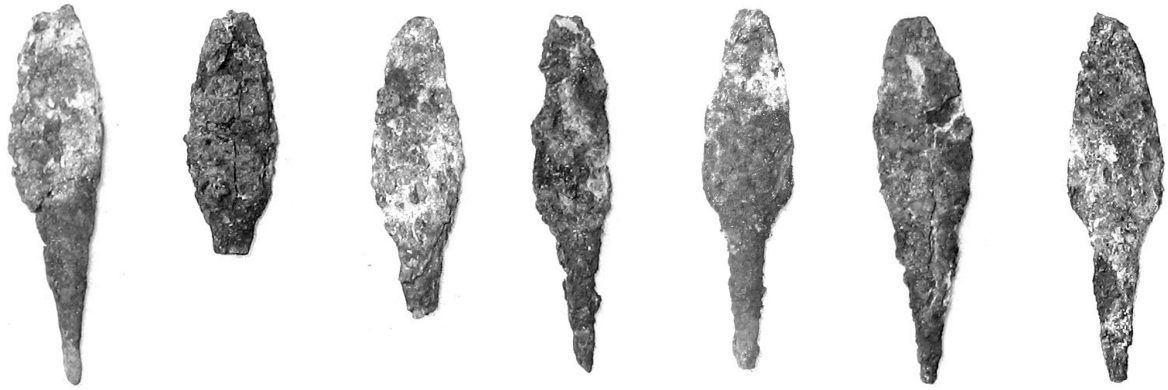
Sources:

Site	No.	Type	Item No.	Source
Nimrud	227	5a-1	ND 10944	British Museum
Nimrud	47	5a-1	ND 10944	British Museum
Nimrud	154	5a-1	ND 10944	British Museum
Nimrud	121	5a-1	ND 10944	British Museum
Nimrud	101	5a-1	ND 10944	British Museum
Nimrud	104	5a-1	ND 10944	British Museum
Nimrud	82	5a-1	ND 10944	British Museum
Nimrud	202	5a-1	ND 10944	British Museum
Nimrud	147	5a-1	ND 10944	British Museum
Nimrud	159	5a-1	ND 10944	British Museum
Nimrud	119	5a-1	ND 10944	British Museum
Nimrud	229	5a-1	ND 10944	British Museum
Nimrud	247	5a-1	ND 7534	British Museum
Nimrud	48	5a-1	ND 10944	British Museum

Type 5a-1 (continued)



Nimrud 171 Gerar 43 Nimrud 261 Nimrud 175
Nimrud 226 Nimrud 182 Nimrud 64



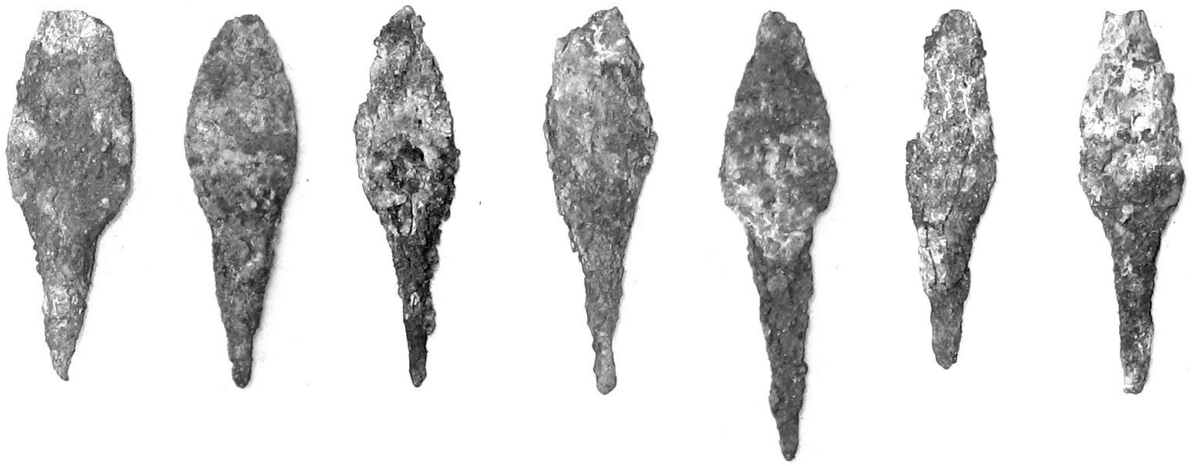
Nimrud 56 Nimrud 218 Nimrud 149 Nimrud 105 Nimrud 248 Nimrud 206 Nimrud 184

Sources:

Site	No.	Type	Item No.	Source
Nimrud	171	5a-1	ND 10944	British Museum
Nimrud	226	5a-1	ND 10944	British Museum
Gerar	43	5a-1	pl. 29:28	Petrie 1928, pl. 29:28
Nimrud	182	5a-1	ND 10944	British Museum
Nimrud	261	5a-1	ND 7505	British Museum
Nimrud	64	5a-1	ND 10944	British Museum
Nimrud	175	5a-1	ND 10944	British Museum
Nimrud	56	5a-1	ND 10944	British Museum
Nimrud	218	5a-1	ND 10944	British Museum
Nimrud	149	5a-1	ND 10944	British Museum
Nimrud	105	5a-1	ND 10944	British Museum
Nimrud	248	5a-1	ND 7534	British Museum
Nimrud	206	5a-1	ND 10944	British Museum
Nimrud	184	5a-1	ND 10944	British Museum

Plate 92

Type 5a-1 (continued)



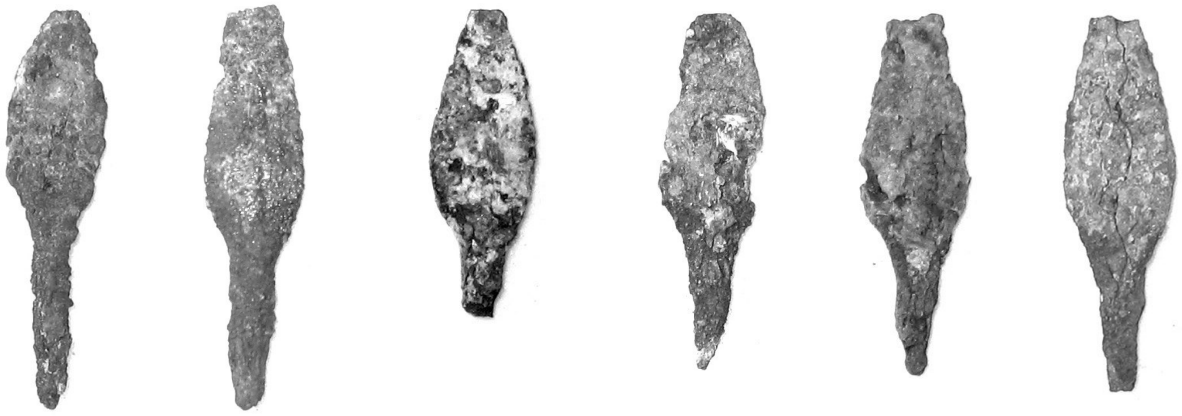
Nimrud 118 Nimrud 222 Nimrud 46 Nimrud 115
Nimrud 91 Nimrud 134 Nimrud 73

Nimrud 153 Nimrud 183 Nimrud 126 Nimrud 86 Nimrud 52 Nimrud 136 Nimrud 168

Sources:

Site	No.	Type	Item No.	Source
Nimrud	118	5a-1	ND 10944	British Museum
Nimrud	91	5a-1	ND 10944	British Museum
Nimrud	222	5a-1	ND 10944	British Museum
Nimrud	134	5a-1	ND 10944	British Museum
Nimrud	46	5a-1	ND 10944	British Museum
Nimrud	73	5a-1	ND 10944	British Museum
Nimrud	115	5a-1	ND 10944	British Museum
Nimrud	153	5a-1	ND 10944	British Museum
Nimrud	183	5a-1	ND 10944	British Museum
Nimrud	126	5a-1	ND 10944	British Museum
Nimrud	86	5a-1	ND 10944	British Museum
Nimrud	52	5a-1	ND 10944	British Museum
Nimrud	136	5a-1	ND 10944	British Museum
Nimrud	168	5a-1	ND 10944	British Museum

Type 5a-1 (continued)



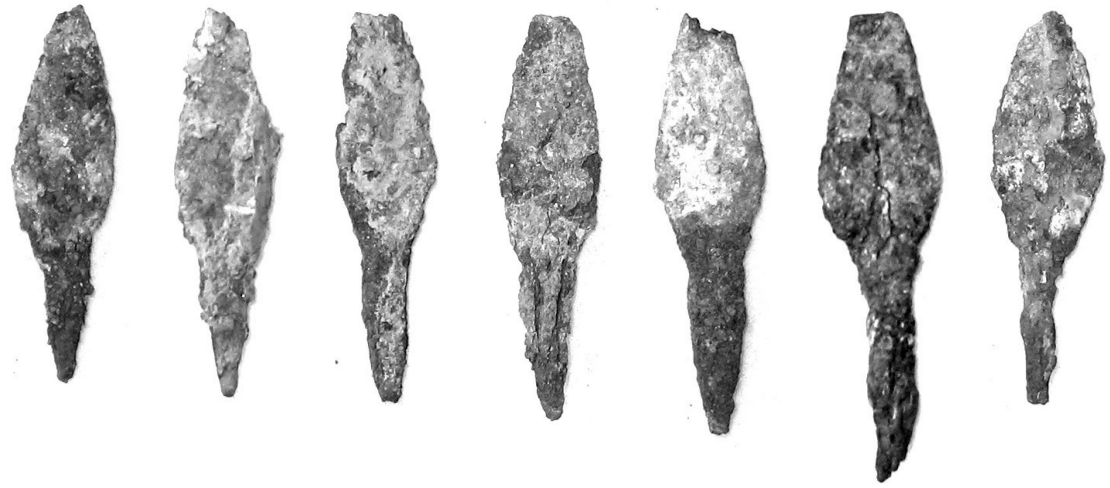
Nimrud 44 Nimrud 246 Nimrud 211 Nimrud 84 Nimrud 146 Nimrud 57

Ayanis 36 Nimrud 142 Nimrud 50 Nimrud 114 Nimrud 186 Nimrud 157

Sources:

Site	No.	Type	Item No.	Source
Nimrud	44	5a-1	ND 10944	British Museum
Nimrud	246	5a-1	ND 7534	British Museum
Nimrud	211	5a-1	ND 10944	British Museum
Nimrud	84	5a-1	ND 10944	British Museum
Nimrud	146	5a-1	ND 10944	British Museum
Nimrud	57	5a-1	ND 10944	British Museum
Ayanis	36	5a-1	36	Derın & Muscarella 2001, fig. 3
Nimrud	142	5a-1	ND 10944	British Museum
Nimrud	50	5a-1	ND 10944	British Museum
Nimrud	114	5a-1	ND 10944	British Museum
Nimrud	186	5a-1	ND 10944	British Museum
Nimrud	157	5a-1	ND 10944	British Museum

Type 5a-1 (continued)



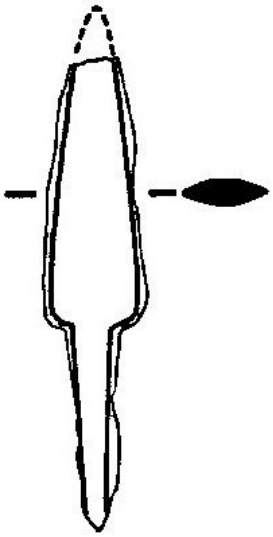
Nimrud151 Nimrud 98 Nimrud 156 Nimrud 88 Nimrud 161 Nimrud 198 Nimrud 150

Nimrud 210 Nimrud 145 Nimrud 90 Nimrud 87 Carchemish 22 Nimrud 254

Sources:

Site	No.	Type	Item No.	Source
Nimrud	151	5a-1	ND 10944	British Museum
Nimrud	98	5a-1	ND 10944	British Museum
Nimrud	156	5a-1	ND 10944	British Museum
Nimrud	88	5a-1	ND 10944	British Museum
Nimrud	161	5a-1	ND 10944	British Museum
Nimrud	198	5a-1	ND 10944	British Museum
Nimrud	150	5a-1	ND 10944	British Museum
Nimrud	210	5a-1	ND 10944	British Museum
Nimrud	145	5a-1	ND 10944	British Museum
Nimrud	90	5a-1	ND 10944	British Museum
Nimrud	87	5a-1	ND 10944	British Museum
Carchemish	22	5a-1	116213	British Museum, 1922-5-11.346
Nimrud	254	5a-1	ND 7542	British Museum

Type 5a-1 (continued)



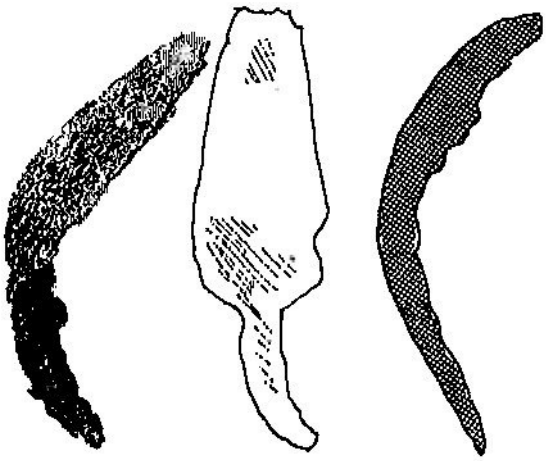
Hasanlu 67

Nimrud 100

Gerar 59

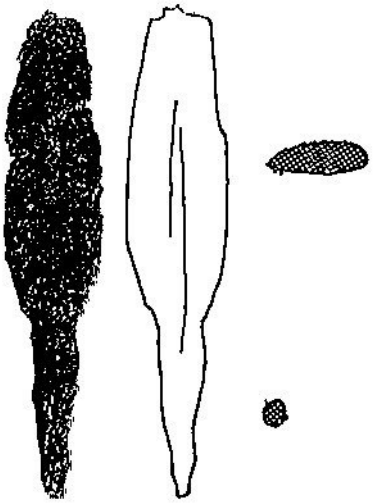
Nimrud 166

Gerar 42



Lachish 344

Nimrud 255

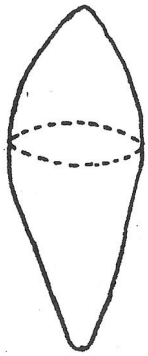


Lachish 340

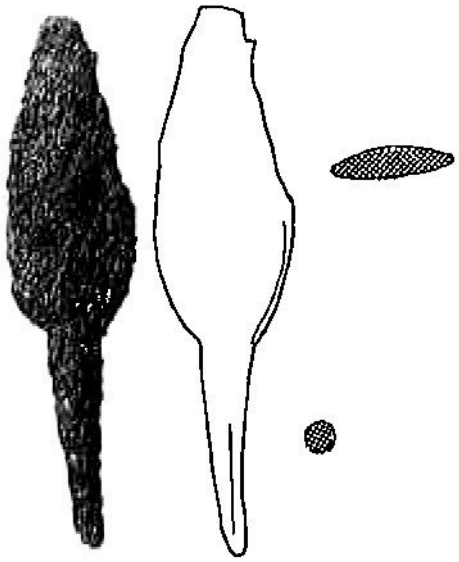
Sources:

Site	No.	Type	Item No.	Source
Hasanlu	67	5a-1	HAS 60-909	Thornton & Pigott 2011, p. 145, fig. 6.6:20
Nimrud	100	5a-1	ND 10944	British Museum
Gerar	59	5a-1	pl. 29:44	Petrie 1928, pl. 29:44
Nimrud	166	5a-1	ND 10944	British Museum
Gerar	42	5a-1	pl. 29:27	Petrie 1928, pl. 29:27
Lachish	344	5a-1	62093/60	Gottlieb 2004, p. 1941, fig. 27.15:10
Nimrud	255	5a-1	ND 9215	British Museum
Lachish	340	5a-1	60849/60	Gottlieb 2004, p. 1941, fig. 27.15:6

Type 5a-1 (continued)

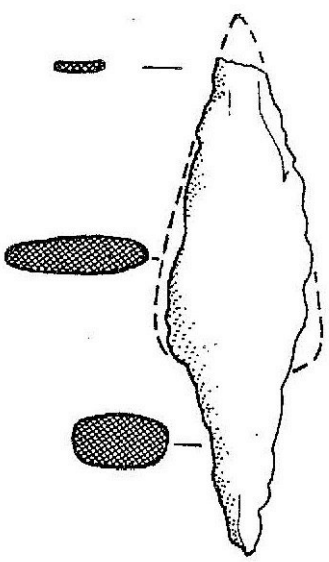


Lachish 19

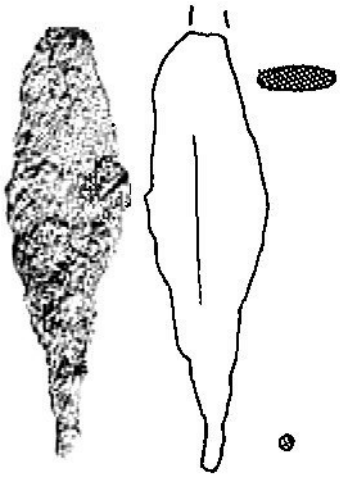


Lachish 125

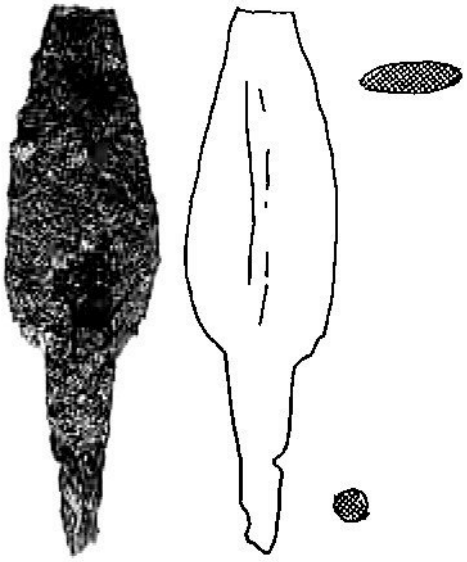
Nimrud 253



Lachish 65



Lachish 368

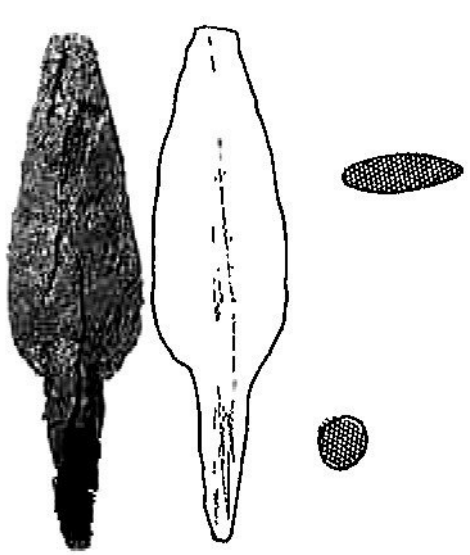


Lachish 262

Sources:

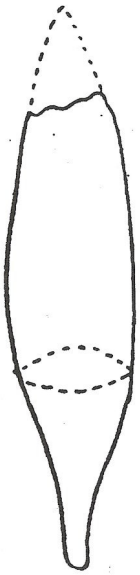
Site	No.	Type	Item No.	Source
Lachish	19	5a-1	5484	Tufnell et al 1953, p. 106-7; pl. 60:7
Lachish	125	5a-1	31522/60	Gottlieb 2004, p. 1919, fig. 27.4:2
Nimrud	253	5a-1	ND 10998	British Museum
Lachish	65	5a-1	586/60	Rothenberg 1975, p. 74, pl. 36:1
Lachish	368	5a-1	5479	Gottlieb 2004, p. 1949, fig. 27.19:16
Lachish	262	5a-1	60551/60	Gottlieb 2004, p. 1933, fig. 27.11:5

Type 5a-1 (continued)



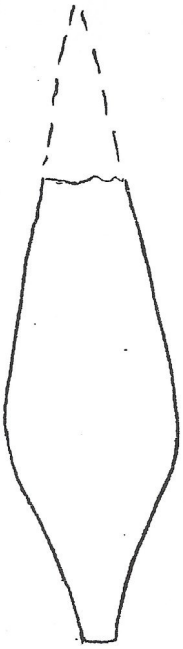
Lachish 124

Gerar 56

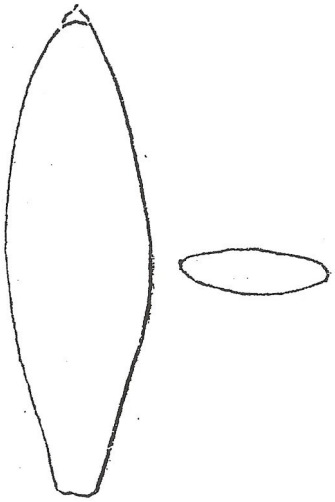


Lachish 46

Gerar 50



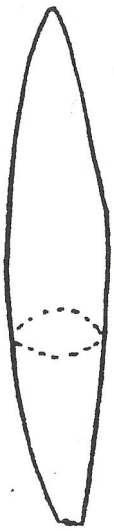
Gerar 70



Gerar 73

Lachish 49

Gerar 39



Lachish 41

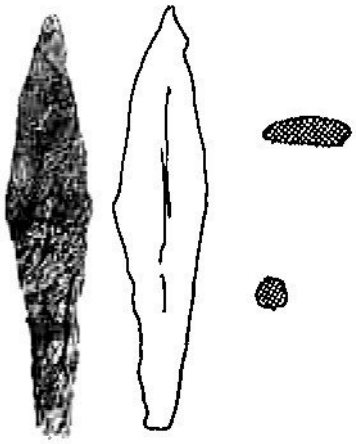
Sources:

Site	No.	Type	Item No.	Source
Lachish	124	5a-1	39017/61	Gottlieb 2004, p. 1919, fig. 27.4:1
Gerar	56	5a-1	pl. 29:41	Petrie 1928, pl. 29:41
Lachish	46	5a-1	7121	Tufnell et al 1953, p. 123, pl. 60:34
Gerar	50	5a-1	pl. 29:35	Petrie 1928, pl. 29:35
Gerar	70	5a-1	pl. 29:55	Petrie 1928, pl. 29:55
Gerar	73	5a-1	pl. 29:58	Petrie 1928, pl. 29:58
Lachish	49	5a-1	7133	Tufnell et al 1953, p. 124, pl. 60:37
Gerar	39	5a-1	pl. 29:24	Petrie 1928, pl. 29:24
Lachish	41	5a-1	7093	Tufnell et al 1953, p. 122, pl. 60:29

Type 5a-1 (continued)

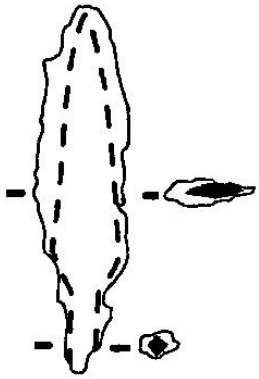
Gerar 58

Carchemish 27

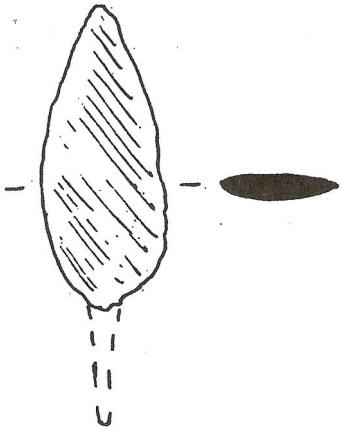


Lachish 335

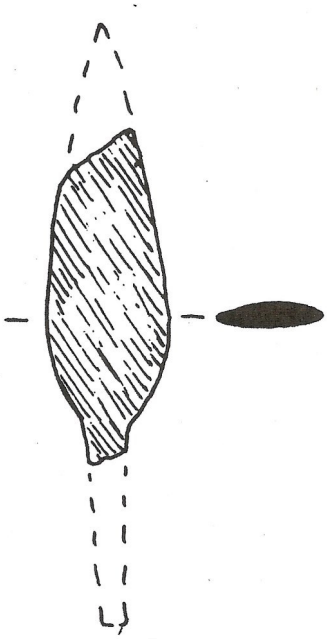
Nimrud 242



Hasanlu 33



Bastam 17



Bastam 6

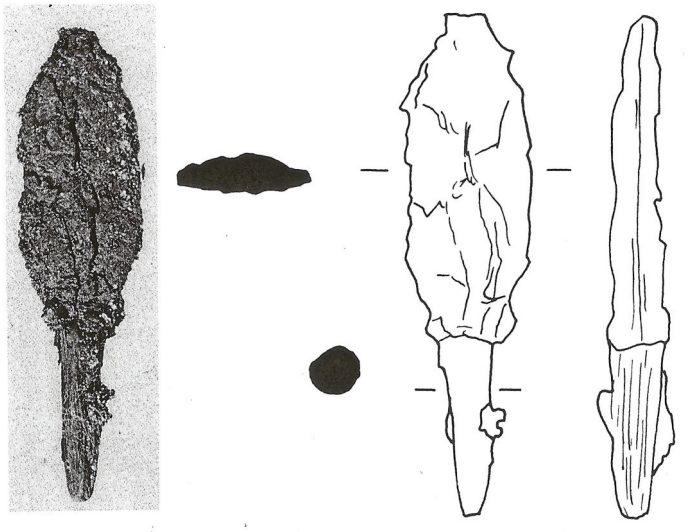
Nimrud 260

Sources:

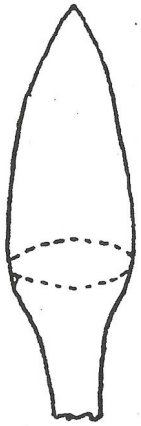
Site	No.	Type	Item No.	Source
Gerar	58	5a-1	pl. 29:43	Petrie 1928, pl. 29:43
Carchemish	27	5a-1?	116218	British Museum, 1922-5-11.351
Lachish	335	5a-1?	60803/60	Gottlieb 2004, p. 1941, fig. 27.15:1
Nimrud	242	5a-1?	ND 10944	British Museum
Hasanlu	33	5a-1?	HAS 74-N683 a	Thornton & Pigott 2011, p. 142, fig. 6.3:16
Bastam	17	5a-1?	75/42	Kroll 1979, p. 166; Abb 16:33
Bastam	6	5a-1?	72/16	Kroll 1979, p. 160, Abb 10:10
Nimrud	260	5a-1?	ND 5219	British Museum

Plate 99

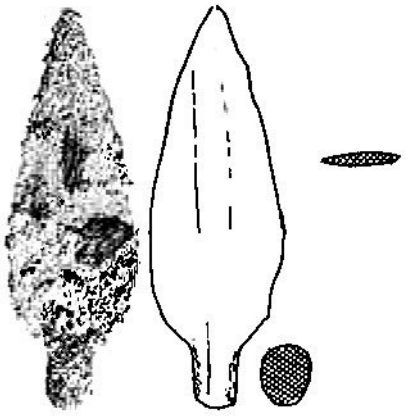
Type 5a-1 (continued)



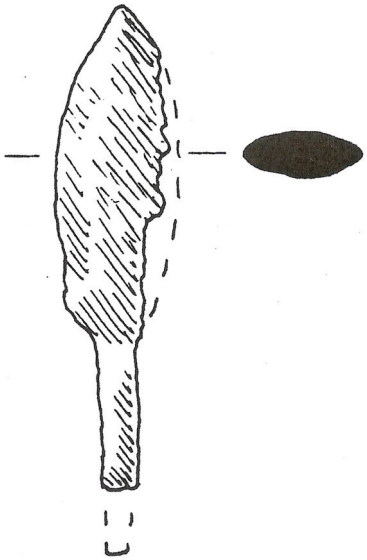
Uruk 11



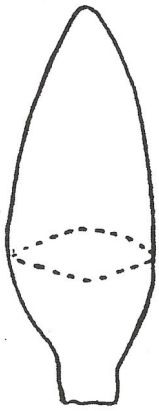
Lachish 50



Lachish 367



Bastam 9



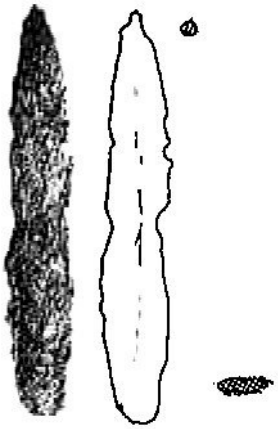
Lachish 42

Sources:

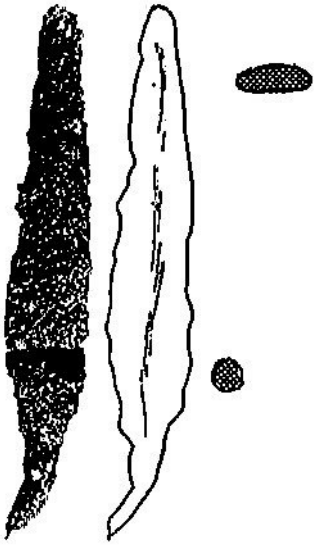
Site	No.	Type	Item No.	Source
Uruk	11	5a-1?	W 21971,1	van Ess & Pedde 1992, p. 68, no. 752
Lachish	50	5a-1?	7134	Tufnell et al 1953, p. 124, pl. 60:38
Lachish	367	5a-1?	5481	Gottlieb 2004, p. 1949, fig. 27.19:6
Bastam	9	5a-1?	74/81a	Kroll 1979, p. 164; Abb. 15:5
Lachish	42	5a-1?	7092	Tufnell et al 1953, p. 122, pl. 60:30

Plate 100

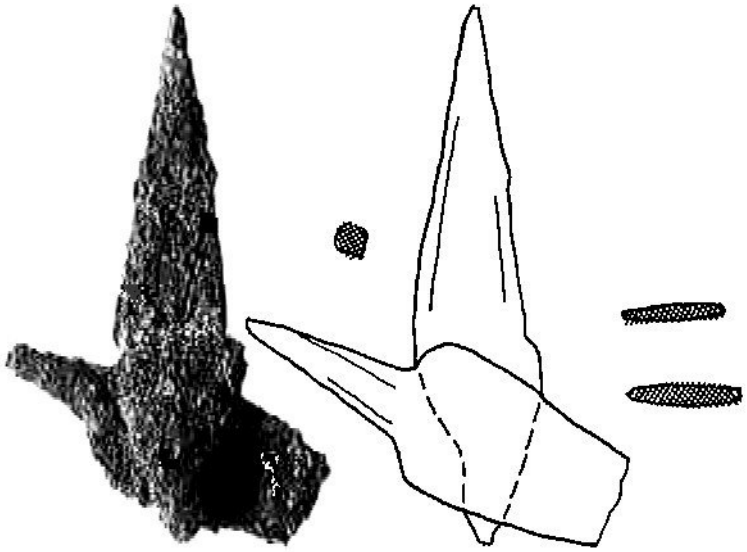
Type 5a-1 (continued)



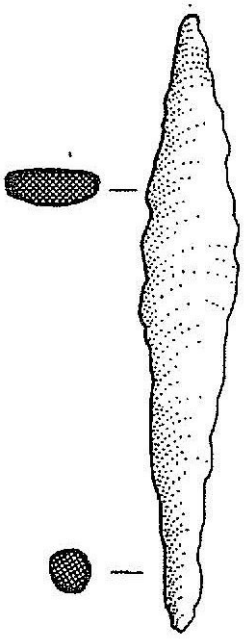
Lachish 206



Lachish 175



Lachish 93

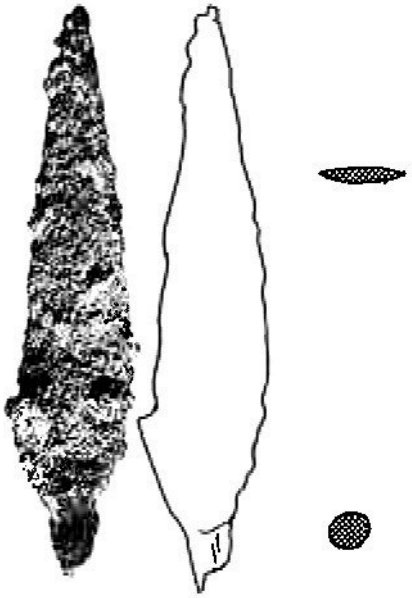


Lachish 72

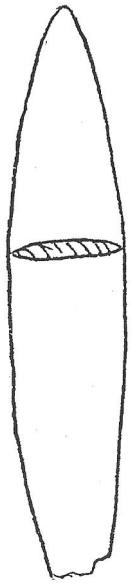
Sources:

Site	No.	Type	Item No.	Source
Lachish	206	5a-1?	61622/60	Gottlieb 2004, p. 1927, fig. 27.8:5
Lachish	175	5a-1?	60953/60	Gottlieb 2004, p. 1923, fig. 27.6:14
Lachish	93	5a-1?	31801/65	Gottlieb 2004, p. 1915, fig. 27.2:3
Lachish	72	5a-1?	510/60	Rothenberg 1975, p. 75, pl. 36:8

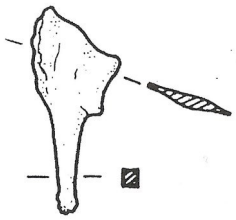
Type 5a-1 (continued)



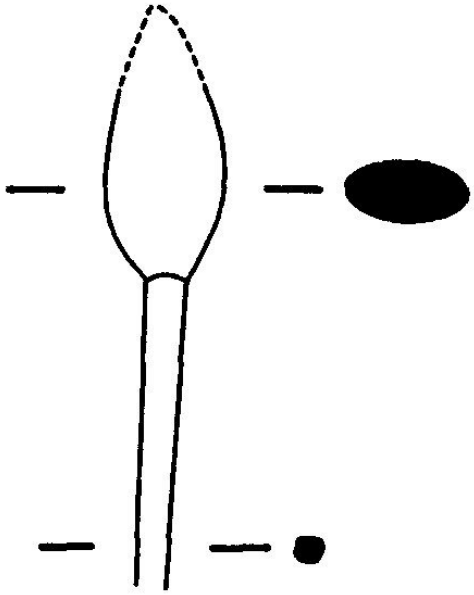
Lachish 355



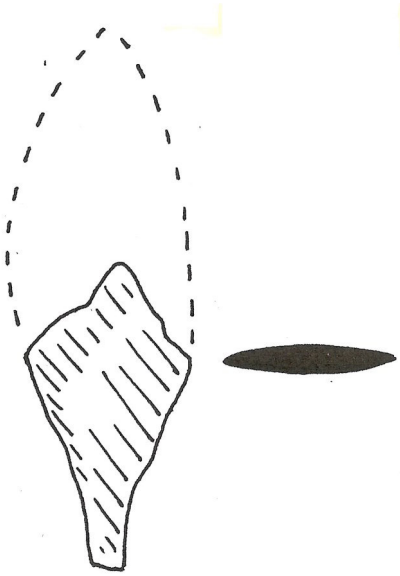
Gerar 71



Nush-i Jan 10



Hasanlu 31

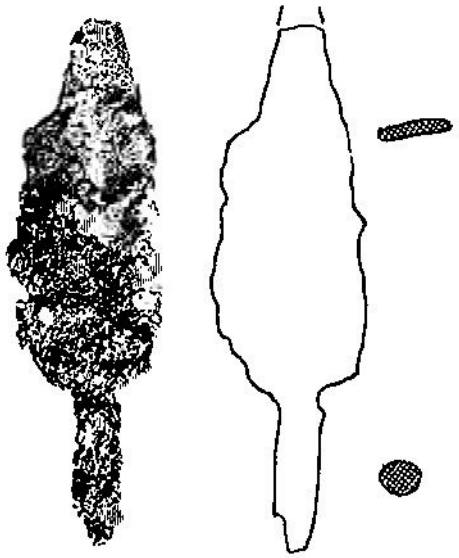


Bastam 12

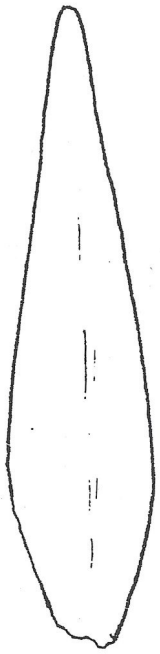
Sources:

Site	No.	Type	Item No.	Source
Lachish	355	5a-1?	5480	Gottlieb 2004, p. 1945, fig. 27.17:1
Gerar	71	5a-1?	pl. 29:56	Petrie 1928, pl. 29:56
Nush-i Jan	10	5a-1?	NU 74/35	Curtis 1984, p. 27, fig 6:257
Hasanlu	31	5a-1?	HAS 70-D8	Thornton & Pigott 2011, p. 142, fig. 6.3:14
Bastam	12	5a-1?	75/178	Kroll 1979, p. 164; Abb 16:6

Type 5a-1 (continued)

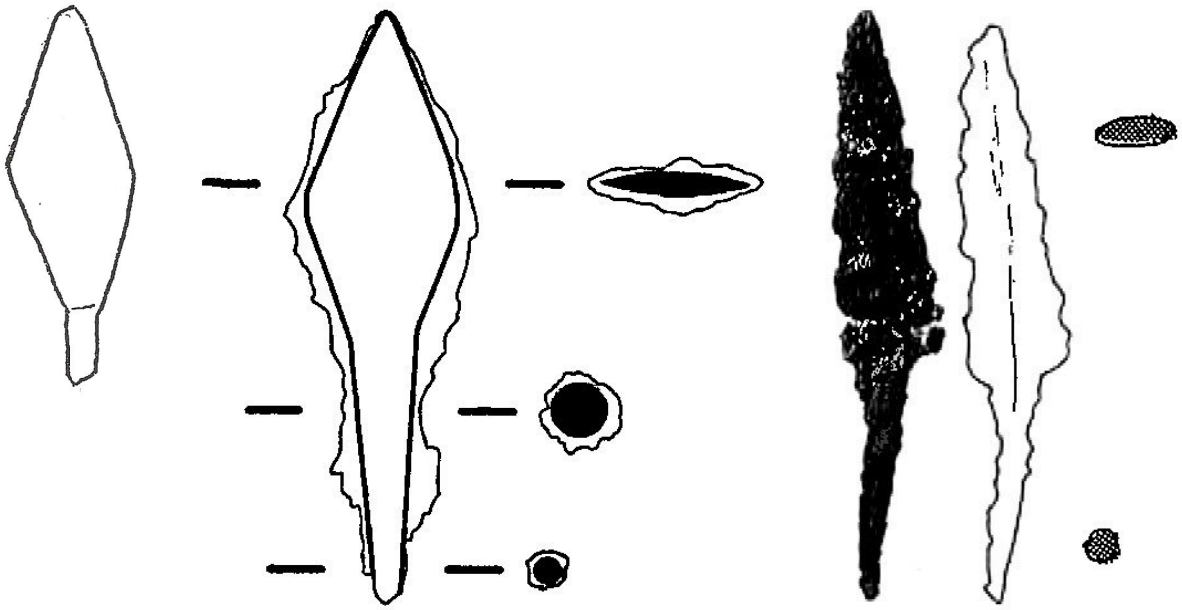


Lachish 362



Gerar 44

Type 5a-2



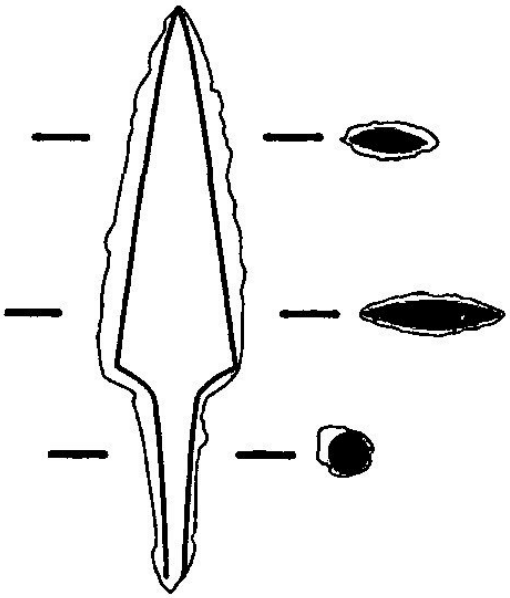
Gerar 61 Hasanlu 10 Lachish 176

Sources:

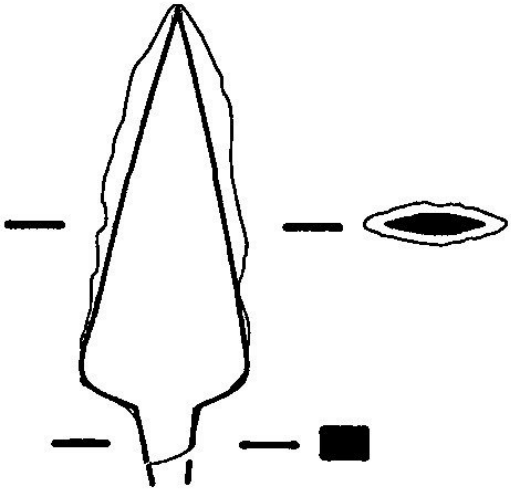
Site	No.	Type	Item No.	Source
Lachish	362	5a-1?	7059	Gottlieb 2004, p. 1947, fig. 27.18:6
Gerar	44	5a-1?	pl. 29:29	Petrie 1928, pl. 29:29
Gerar	61	5a-2	pl. 29:46	Petrie 1928, pl. 29:46
Hasanlu	10	5a-2	HAS 74-N683 w	Thornton & Pigott 2011, p. 141, fig. 6.2:10
Lachish	176	5a-2	62008/60	Gottlieb 2004, p. 1923, fig. 27.6:15

Plate 103

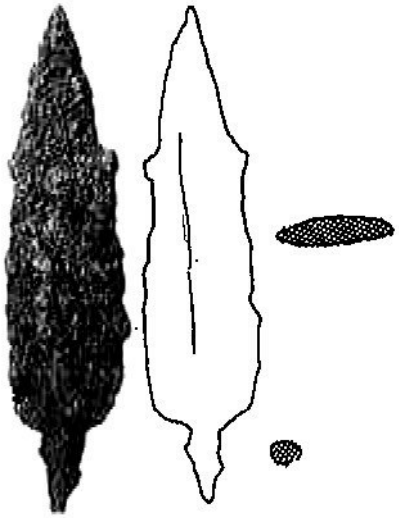
Type 5a-2 (continued)



Hasanlu 8



Hasanlu 7



Lachish 216

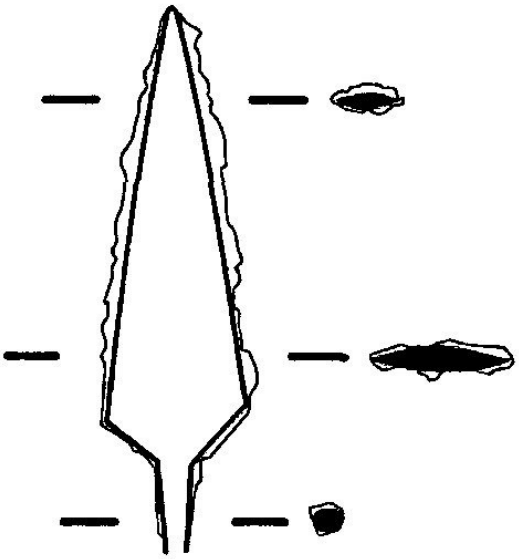
Sialk 34

Sialk 56

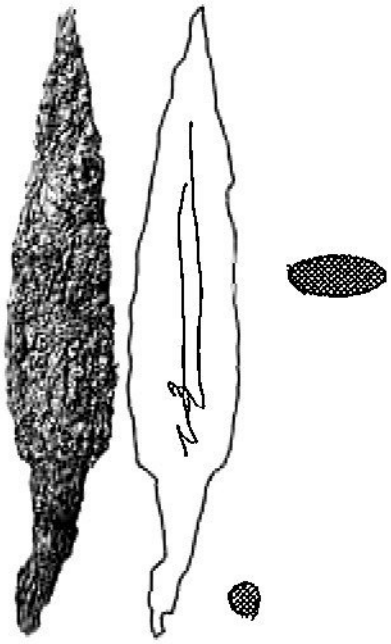
Sources:

Site	No.	Type	Item No.	Source
Hasanlu	8	5a-2	HAS 64-989 d	Thornton & Pigott 2011, p. 141, fig. 6.2:8
Hasanlu	7	5a-2	HAS 62-246	Thornton & Pigott 2011, p. 141, fig. 6.2:7
Lachish	216	5a-2	61041/60	Gottlieb 2004, p. 1927, fig. 27.8:15
Sialk	56	5a-2	S 973a, f	Ghirshman 1939, vol. 2, p. 244, pl. 77
Sialk	34	5a-2	S 764, e	Ghirshman 1939, vol. 2, p. 235, pl. 62

Type 5a-2 (continued)

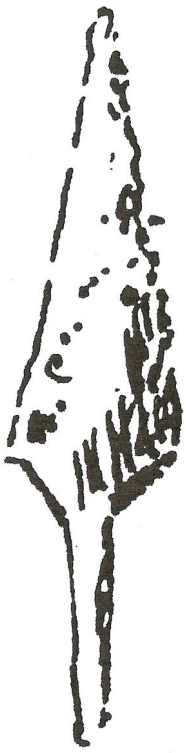


Hasanlu 6



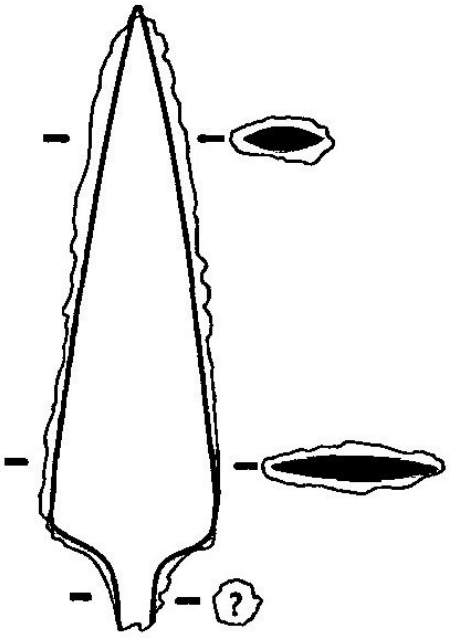
Lachish 191

Sialk 53



Sialk 18

Gerar 57

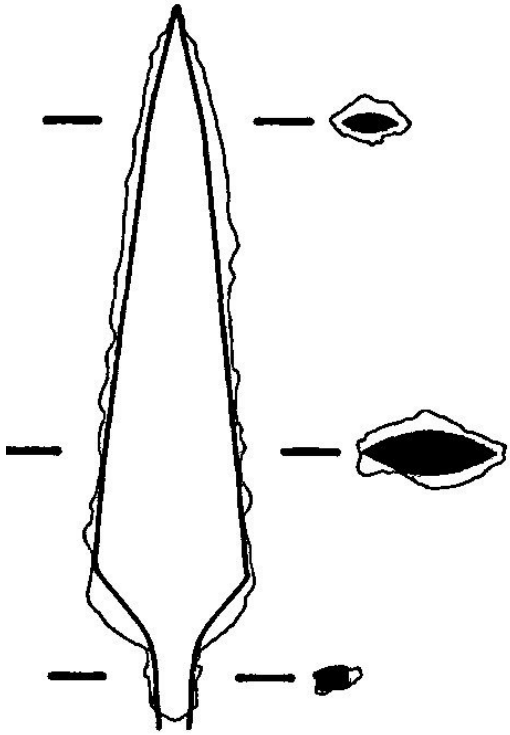


Hasanlu 5

Sources: see Plate 105

Type 5a-2 (continued)

Sialk 22



Hasanlu 3

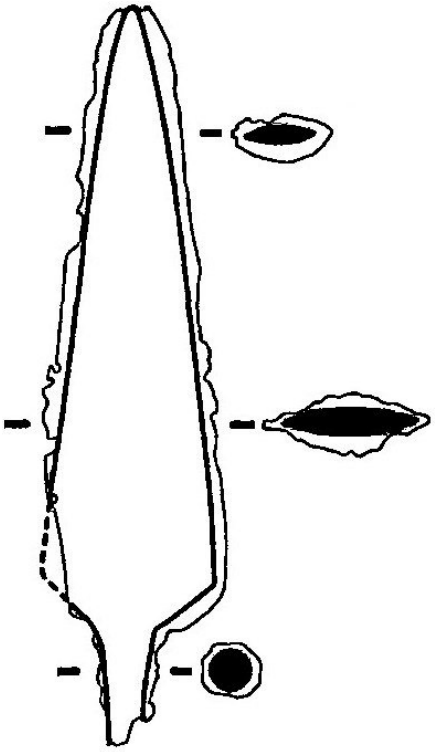
Sources for Plate 104:

Site	No.	Type	Item No.	Source
Hasanlu	6	5a-2	HAS 60-809 b2	Thornton & Pigott 2011, p. 141, fig. 6.2:6
Lachish	191	5a-2	61309/60	Gottlieb 2004, p. 1925, fig. 27.7:10
Sialk	53	5a-2	S 973a, c	Ghirshman 1939, vol. 2, p. 244, pl. 77
Sialk	18	5a-2	S 793a, b	Ghirshman 1939, vol. 2, p, 233, pl. 57
Gerar	57	5a-2	pl. 29:42	Petrie 1928, pl. 29:42
Hasanlu	5	5a-2	HAS 59-788 b1	Thornton & Pigott 2011, p. 141, fig. 6.2:5

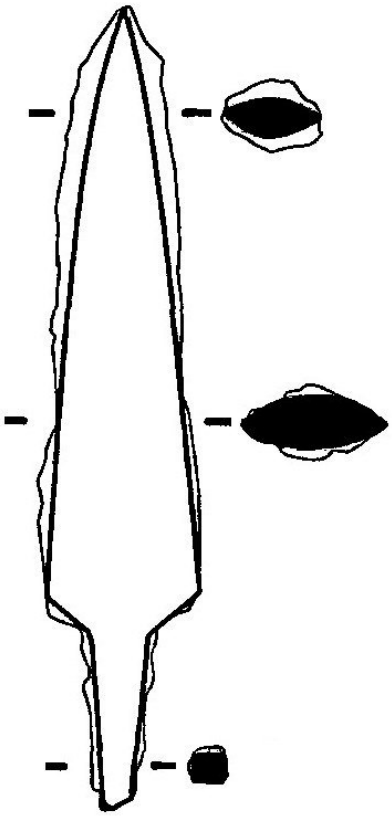
Sources for Plate 105:

Sialk	22	5a-2	S 793a, f	Ghirshman 1939, vol. 2, p, 233, pl. 57
Hasanlu	3	5a-2	HAS 60-809 e1	Thornton & Pigott 2011, p. 141, fig. 6.2:3

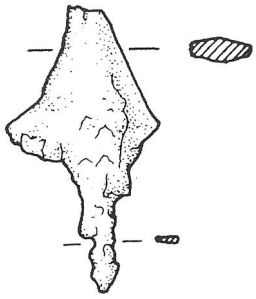
Type 5a-2 (continued)



Hasanlu 2



Hasanlu 1

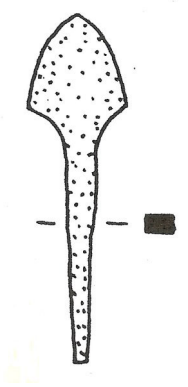


Nush-i Jan 3

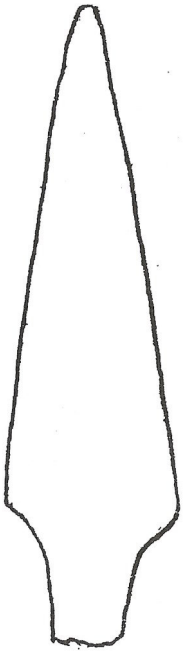
Sources:

Site	No.	Type	Item No.	Source
Hasanlu	2	5a-2	HAS 60-809 b1	Thornton & Pigott 2011, p. 141, fig. 6.2:2
Hasanlu	1	5a-2	HAS 60-16	Thornton & Pigott 2011, p. 141, fig. 6.2:1
Nush-i Jan	3	5a-2?	NU 73/55	Curtis 1984, p. 26, fig 6:250

Type 5a-3



Bastam 4



Gerar 54

Sialk 55

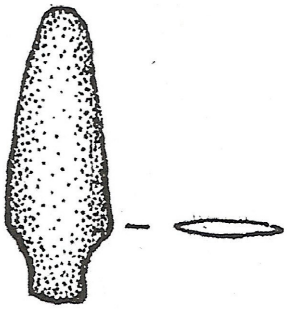
Sialk 48

Sources:

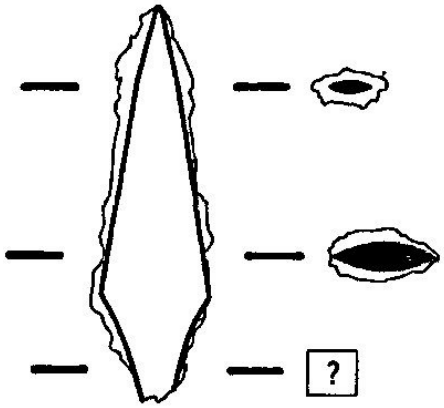
Site	No.	Type	Item No.	Source
Bastam	4	5a-3	72/31	Kroll 1979, p. 158; Abb 8:15, Taf. 51:2
Gerar	54	5a-3	pl. 29:39	Petrie 1928, pl. 29:39
Sialk	55	5a-3	S 973a, e	Ghirshman 1939, vol. 2, p. 244, pl. 77
Sialk	48	5a-3	S 923e, a	Ghirshman 1939, vol. 2, p. 244, pl. 75

Type 5a-3 (continued)

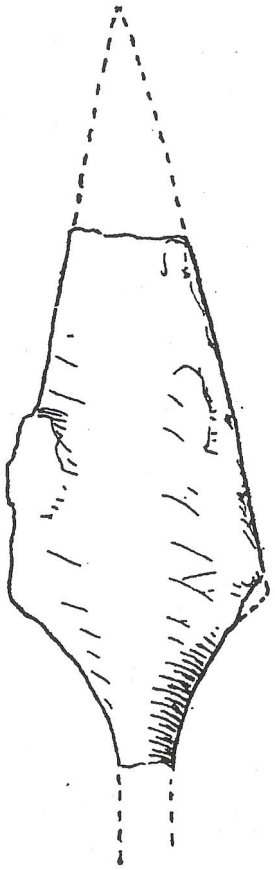
Sialk 16



Marlik 40



Hasanlu 15



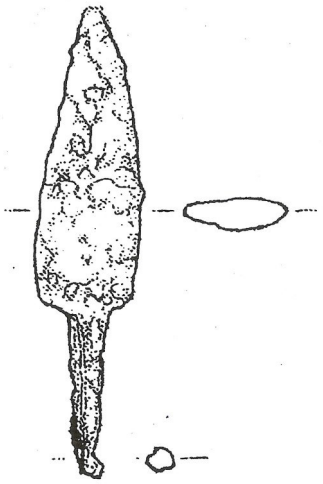
Carchamish 36

Sources:

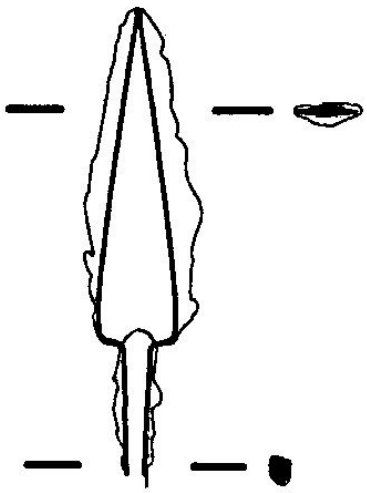
Site	No.	Type	Item No.	Source
Sialk	16	5a-3	S 546f	Ghirshman 1939, vol. 2, p. 229; pl. 50
Marlik	40	5a-3?	1521 M	Negahban 1995, p. 87, fig. 79
Hasanlu	15	5a-3?	HAS 59-788 a1	Thornton & Pigott 2011, p. 141, fig. 6.2:15
Carchemish	36	5a-3?	Pl. 22,8	Wooley 1921, Pl. 23,8

Plate 109

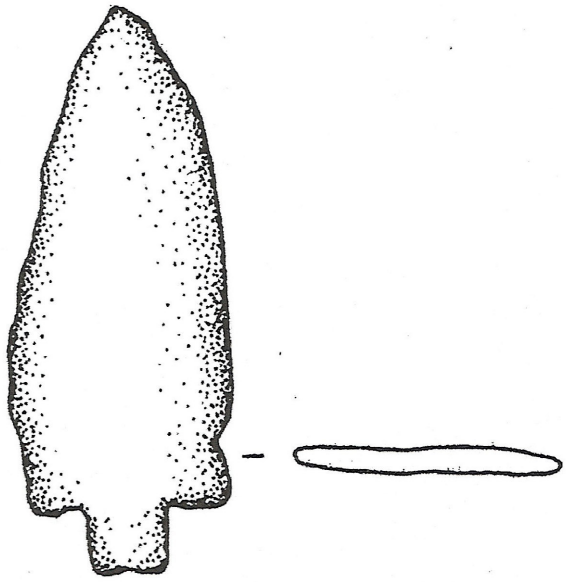
Type 5a-4



Ayanis 11



Hasanlu 17



Marlik 32

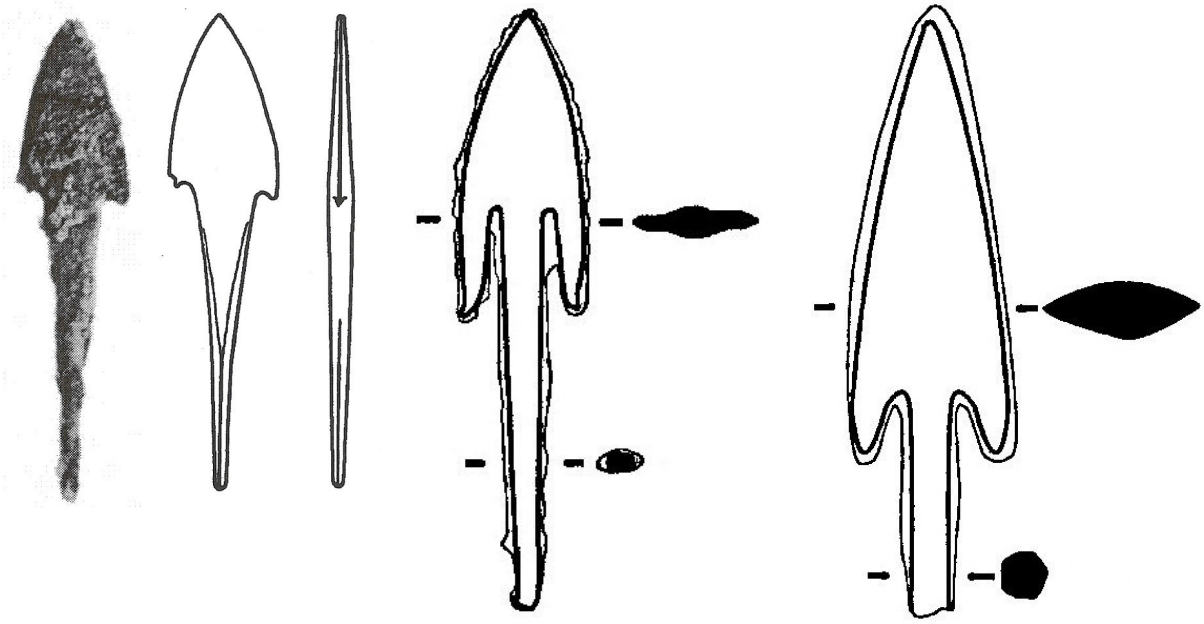
Sialk 36

Sialk 35

Sources:

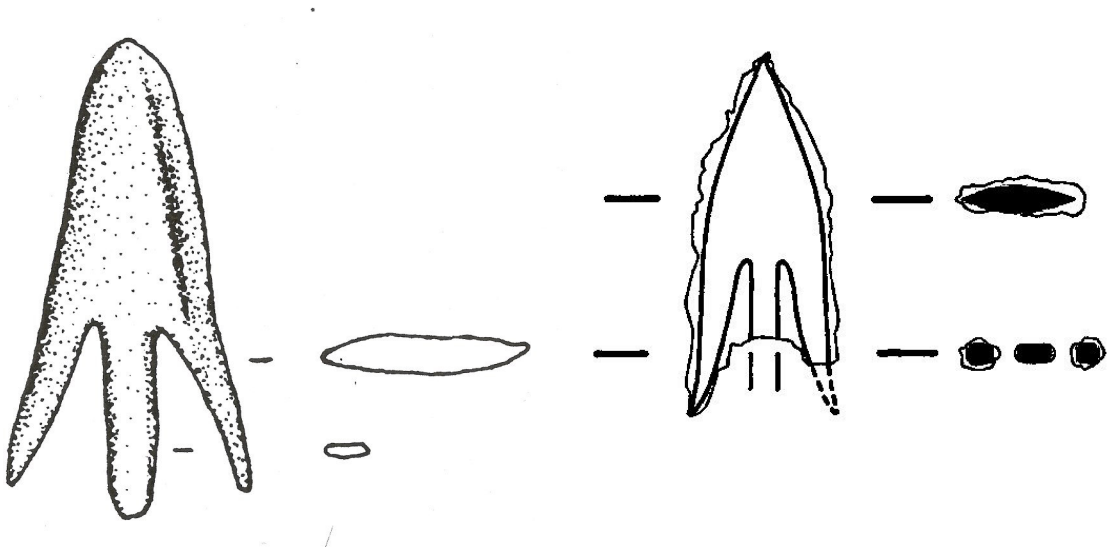
Site	No.	Type	Item No.	Source
Ayanis	11	5a-4	11	Derın & Muscarella 2001, fig. 2
Hasanlu	17	5a-4	HAS 60-223	Thornton & Pigott 2011, p. 141, fig. 6.2:17
Marlik	32	5a-4	769b M	Negahban 1995, p. 86, fig. 71
Sialk	36	5a-4	S 723e	Ghirshman 1939, vol. 2, p. 239, pl. 68
Sialk	35	5a-4?	S 766b	Ghirshman 1939, vol. 2, p. 236, pl. 62

Type 5a-5



Fakhariya 13 Hasanlu 64 Hasanlu 40

Type 5a-9



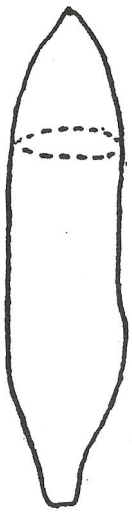
Marlik 8 Hasanlu 42

Sources:

Site	No.	Type	Item No.	Source
Fakhariya	13	5a-5	F449	McEwan et al 1957, p. 49, pl. 49:5 & 52:14
Hasanlu	64	5a-5	HAS 62-882	Thornton & Pigott 2011, p. 145, fig. 6.6:17
Hasanlu	40	5a-5	HAS 64-989 b	Thornton & Pigott 2011, p. 144, fig. 6.5:1
Marlik	8	5a-9	1524 M	Negahban 1995, p. 81, fig. 55
Hasanlu	42	5a-9?	HAS 64-308	Thornton & Pigott 2011, p. 144, fig. 6.5:3

Plate 111

Type 5a-10



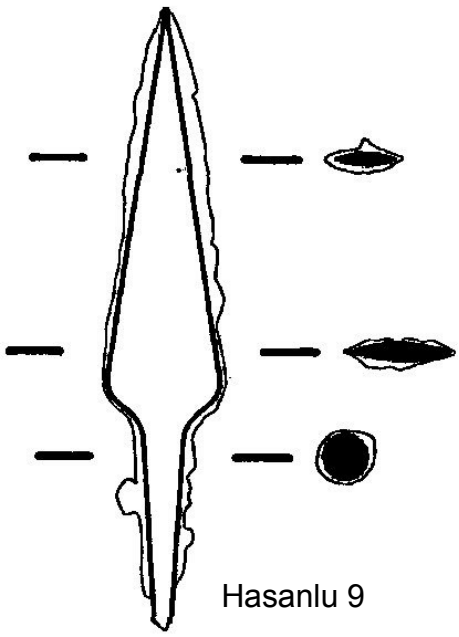
Lachish 7

Type 5a-14

Gerar 84

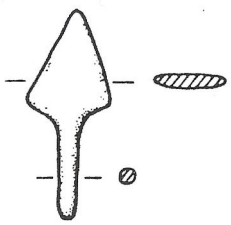
Gerar 74

Type 5a-19

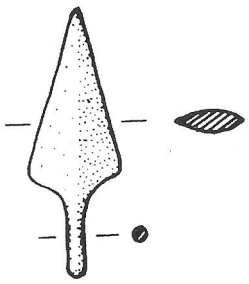


Hasanlu 9

Type 5a-21



Nush-i Jan 9

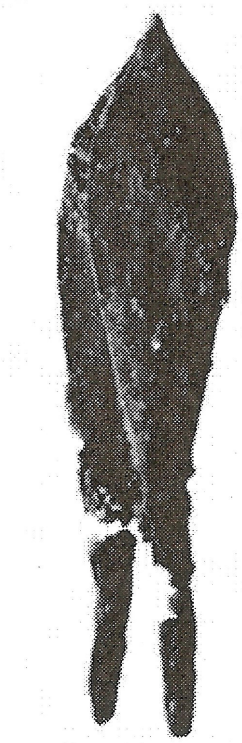


Nush-i Jan 7

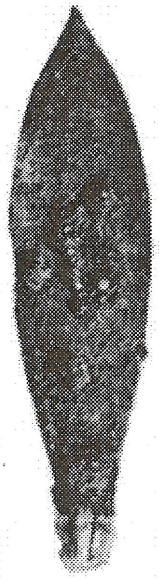
Sources:

Site	No.	Type	Item No.	Source
Lachish	7	5a-10	289	Tufnell et al 1953, p. 186, pl. 54:52
Gerar	84	5a-14	pl. 29:69	Petrie 1928, pl. 29:69
Gerar	74	5a-14?	pl. 29:59	Petrie 1928, pl. 29:59
Hasanlu	9	5a-19	HAS 74-N 683 y	Thornton & Pigott 2011, p. 141, fig. 6.2:9
Nush-i Jan	9	5a-21	NU 67/29	Curtis 1984, p. 27, fig 6:256
Nush-i Jan	7	5a-21	NU 77/27	Curtis 1984, p. 26, fig 6:254

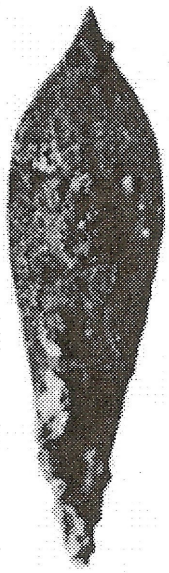
Type 5a-28



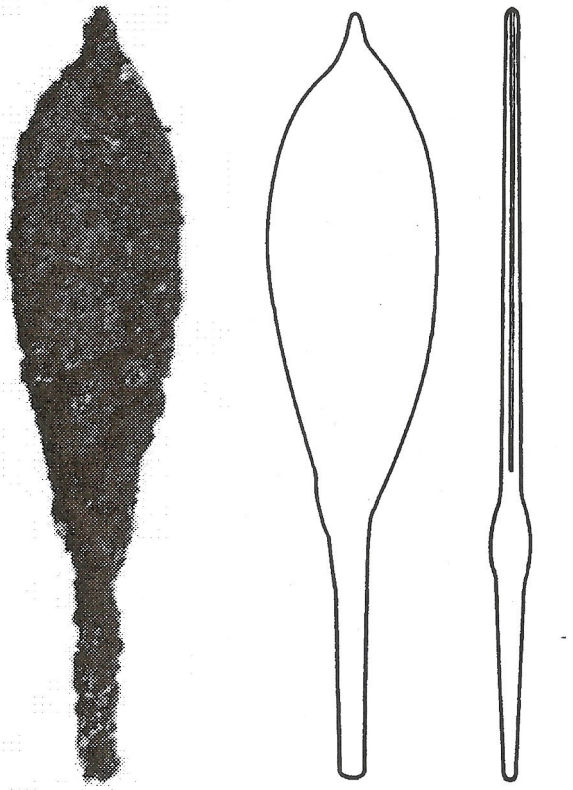
Fakhariya 3 & 4



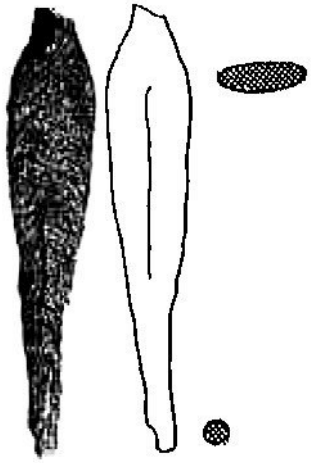
Fakhariya 5



Fakhariya 2



Fakhariya 1

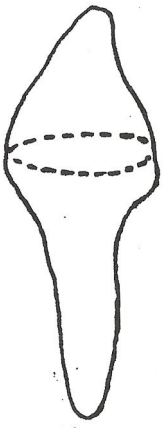


Lachish 87

Sources: see Plate 113

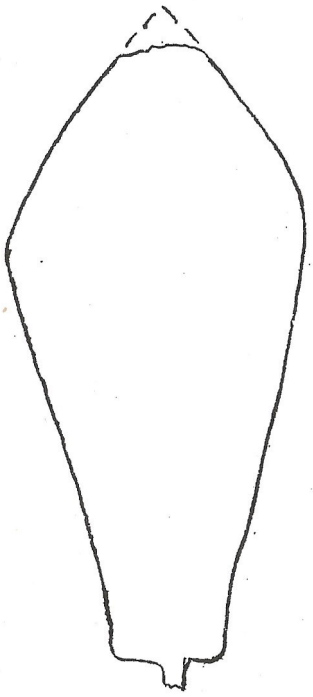
Plate 113

Type 5a-30



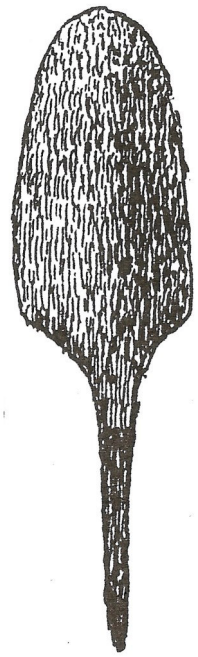
Lachish 8

Type 5a-41



Gerar 80

Type 5a-49



Sialk 79

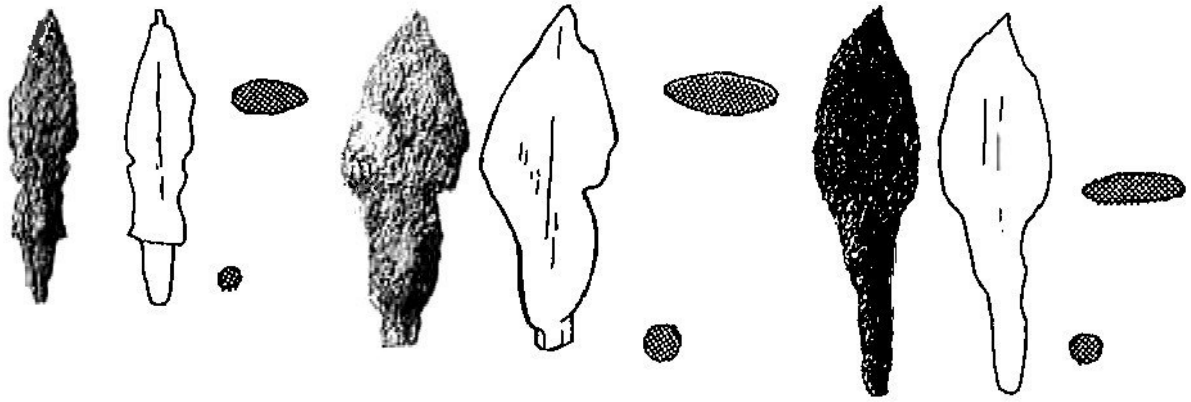
Sources for Plate 112:

Site	No.	Type	Item No.	Source
Fakhariya	3	5a-28	F237c	McEwan et al 1957, p. 46, pl. 45:5
Fakhariya	4	5a-28	F237d	McEwan et al 1957, p. 46, pl. 45:5
Fakhariya	5	5a-28	F237e	McEwan et al 1957, p. 46, pl. 45:6
Fakhariya	2	5a-28	F237b	McEwan et al 1957, p. 46, pl. 45:4
Fakhariya	1	5a-28	F237a	McEwan et al 1957, p. 46, pl. 45:3 & 52:17
Lachish	87	5a-28?	41588/60	Gottlieb 2004, p. 1911, fig. 27.1:16

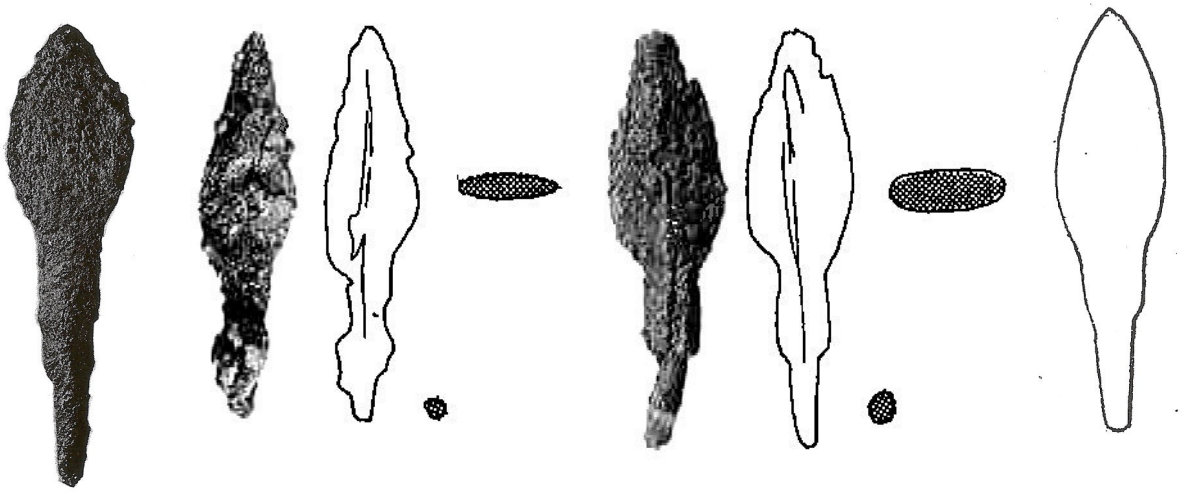
Sources for Plate 113:

Lachish	8	5a-30!	341	Tufnell et al 1953, p. 186, pl. 54:53
Gerar	80	5a-41	pl. 29:65	Petrie 1928, pl. 29:65
Sialk	79	5a-49	pl. 92:23	Ghirshman 1939, vol. 2, p. 248, pl. 92

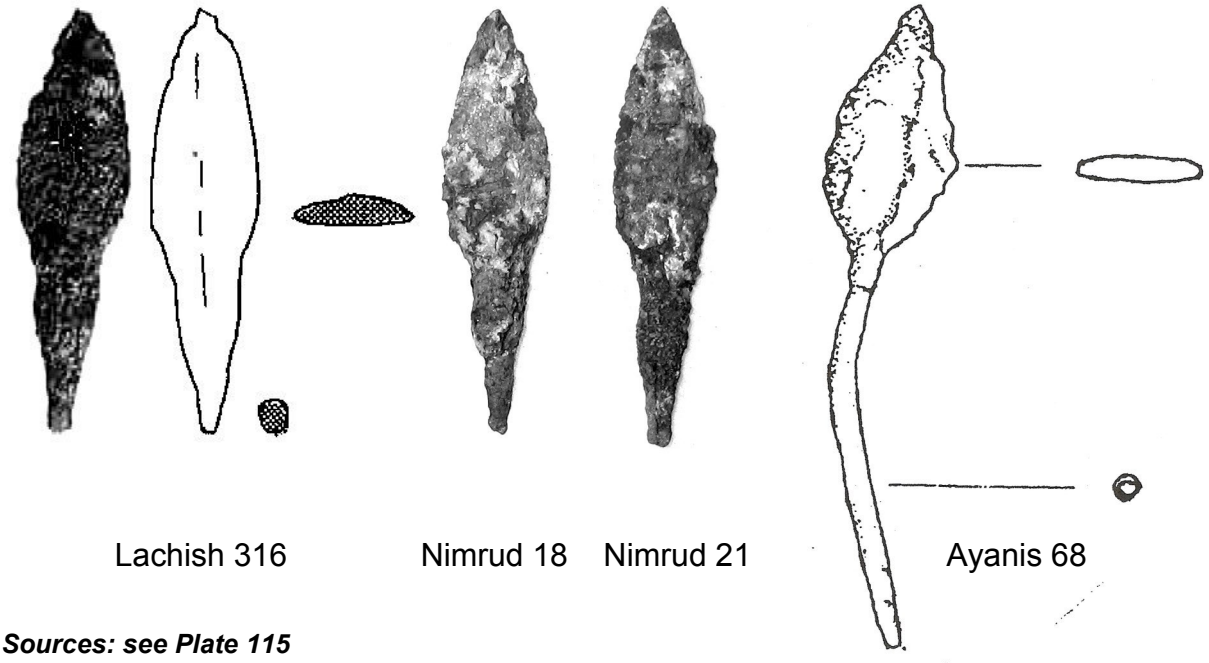
Type 5b-1



Lachish 352 Lachish 32 Lachish 348



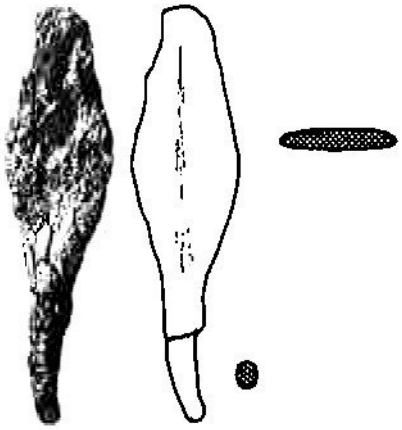
Uruk 13 Lachish 351 Lachish 298 Gerar 82



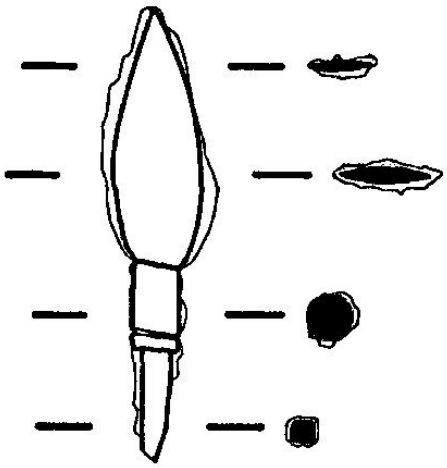
Lachish 316 Nimrud 18 Nimrud 21 Ayanis 68

Sources: see Plate 115

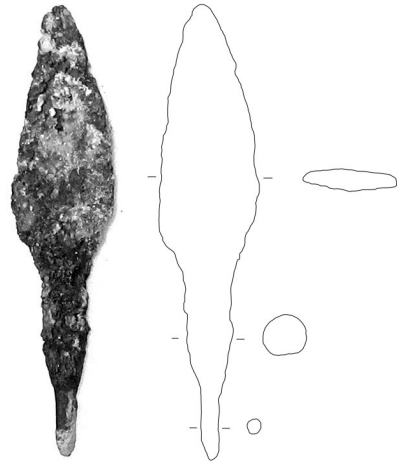
Type 5b-1 (continued)



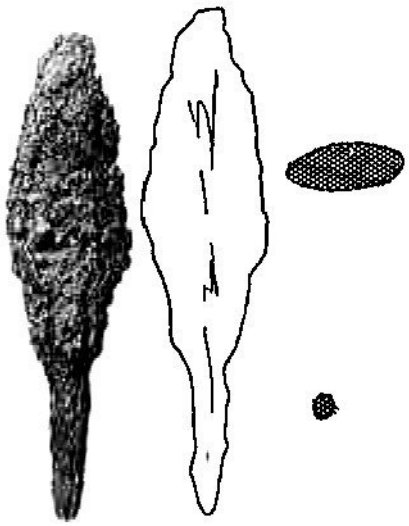
Lachish 79



Hasanlu 32



Nimrud 17



Lachish 301

Carchemish 30

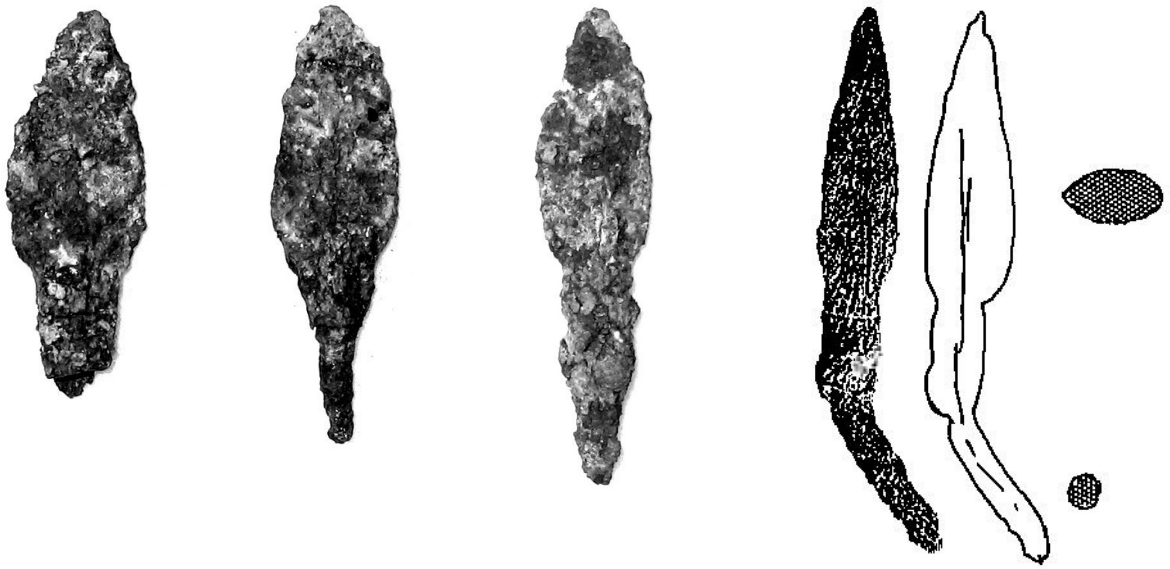
Sources for Plate 114:

Site	No.	Type	Item No.	Source
Lachish	352	5b-1	60545/60	Gottlieb 2004, p. 1941, fig. 27.15:20
Lachish	32	5b-1!	6293	Gottlieb 2004, p. 1949, fig. 27.19:8
Lachish	348	5b-1	60673/60	Gottlieb 2004, p. 1941, fig. 27.15:15
Uruk	13	5b-1	W 21710	van Ess & Pedde 1992, p. 37, no. 353
Lachish	351	5b-1	62248	Gottlieb 2004, p. 1941, fig. 27.15:19
Lachish	298	5b-1	61509/60	Gottlieb 2004, p. 1937, fig. 27.13:4
Gerar	82	5b-1	pl. 29:67	Petrie 1928, pl. 29:67
Lachish	316	5b-1	61796/60	Gottlieb 2004, p. 1937, fig. 27.13:24
Nimrud	18	5b-1	ND 10944	British Museum
Nimrud	21	5b-1	ND 10944	British Museum
Ayanis	68	5b-1!	68	Derın & Muscarella 2001, fig. 5

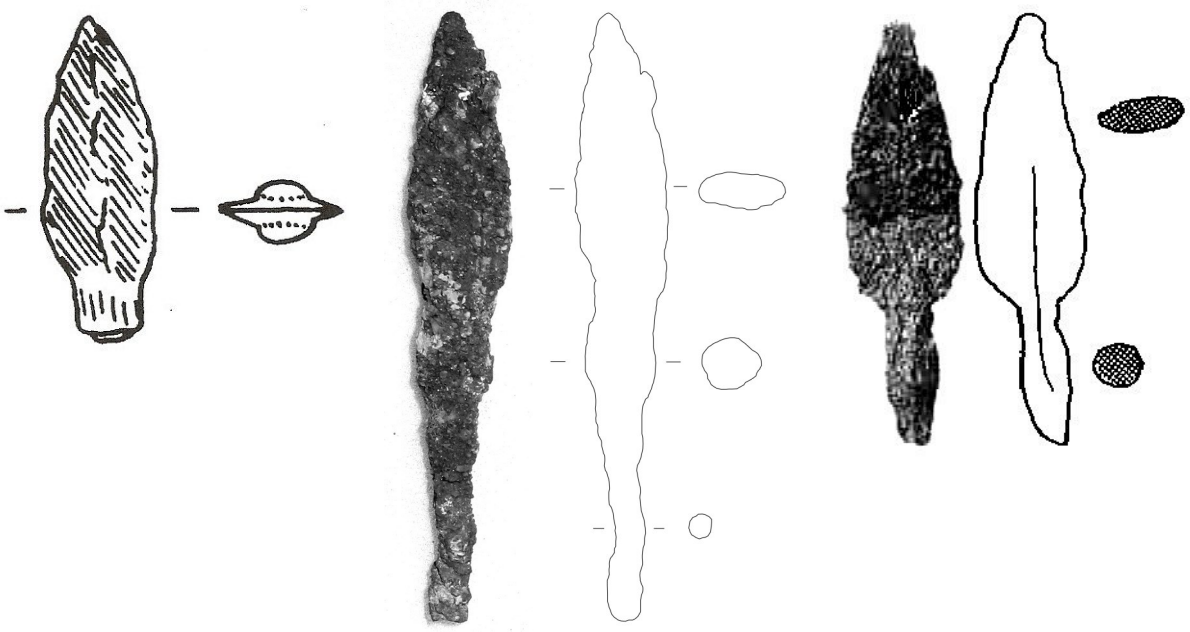
Sources for Plate 115:

Lachish	79	5b-1	40296/60	Gottlieb 2004, p. 1911, fig. 27.1:2
Hasanlu	32	5b-1	HAS 74-N683 r	Thornton & Pigott 2011, p. 142, fig. 6.3:15
Nimrud	17	5b-1	ND 10944	British Museum
Lachish	301	5b-1	61278/60	Gottlieb 2004, p. 1937, fig. 27.13:7
Carchemish	30	5b-1	116221	British Museum, 1922-5-11.354

Type 5b-1 (continued)



Nimrud 25 Nimrud 24 Nimrud 5 Lachish 287

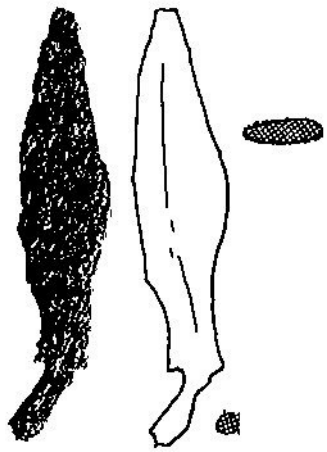


Bastam 20 Nimrud 237 Lachish 314

Sources:

Site	No.	Type	Item No.	Source
Nimrud	25	5b-1	ND 10944	British Museum
Nimrud	24	5b-1	ND 10944	British Museum
Nimrud	5	5b-1	ND 9268	British Museum
Lachish	287	5b-1	62055/60	Gottlieb 2004, p. 1935, fig. 27.12:13
Bastam	20	5b-1	78/1254	Kroll 1988, p. 157, Abb. 3:5
Nimrud	237	5b-1	ND 10944	British Museum
Lachish	314	5b-1	61124/60	Gottlieb 2004, p. 1937, fig. 27.13:22

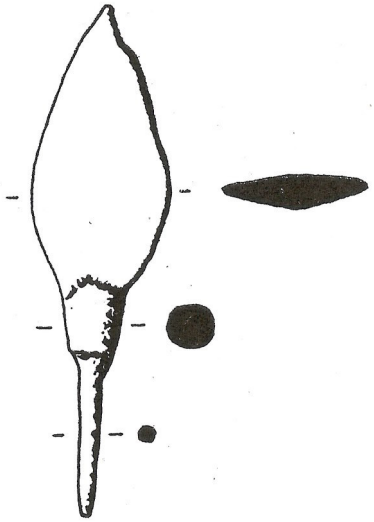
Type 5b-1 (continued)



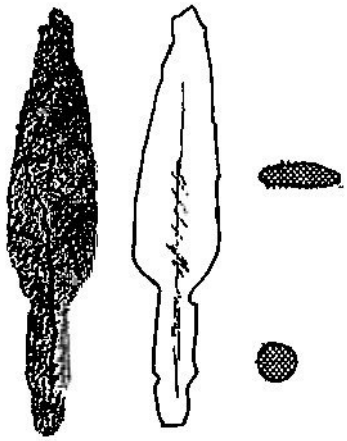
Lachish 343

Lachish 37

Nimrud 36



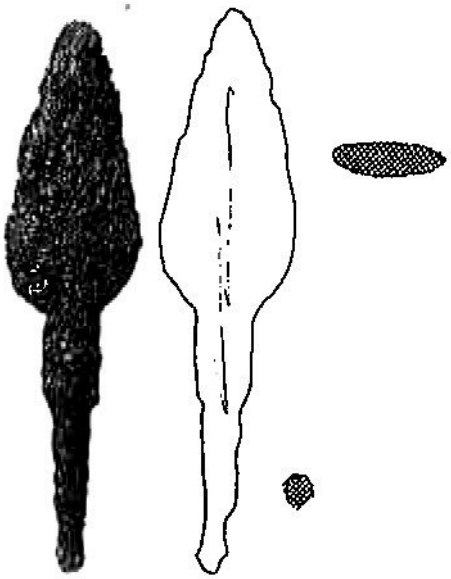
Toprakkale 9



Lachish 337

Uruk 2

Nimrud 37

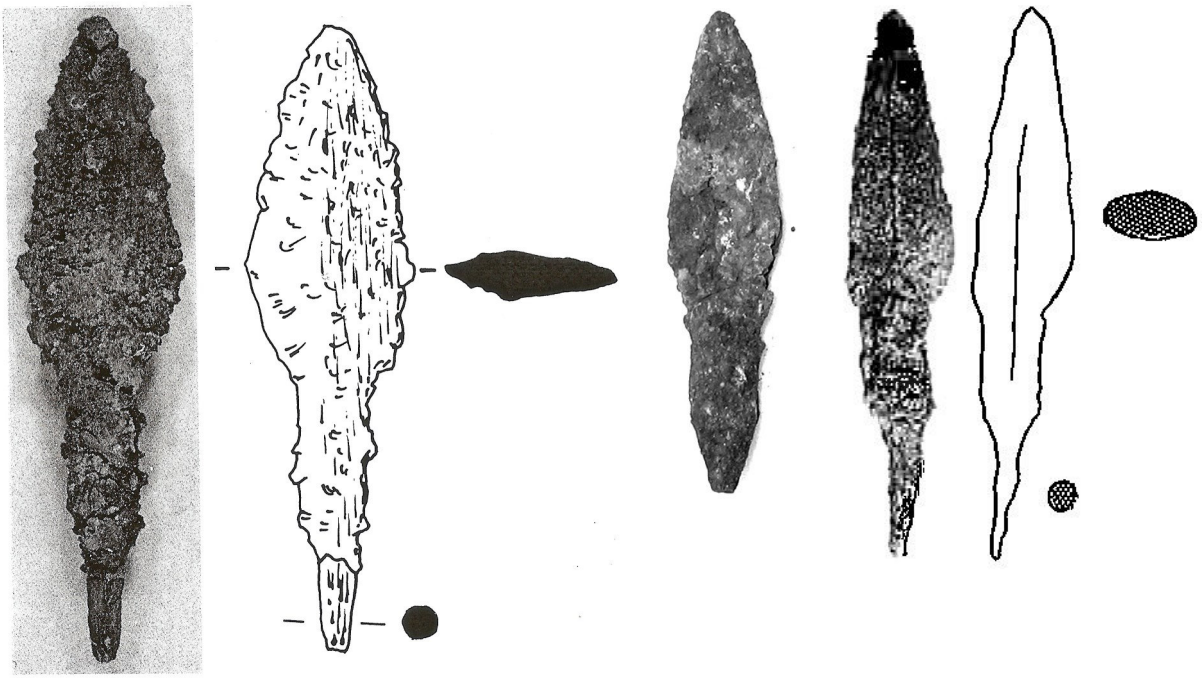


Lachish 285

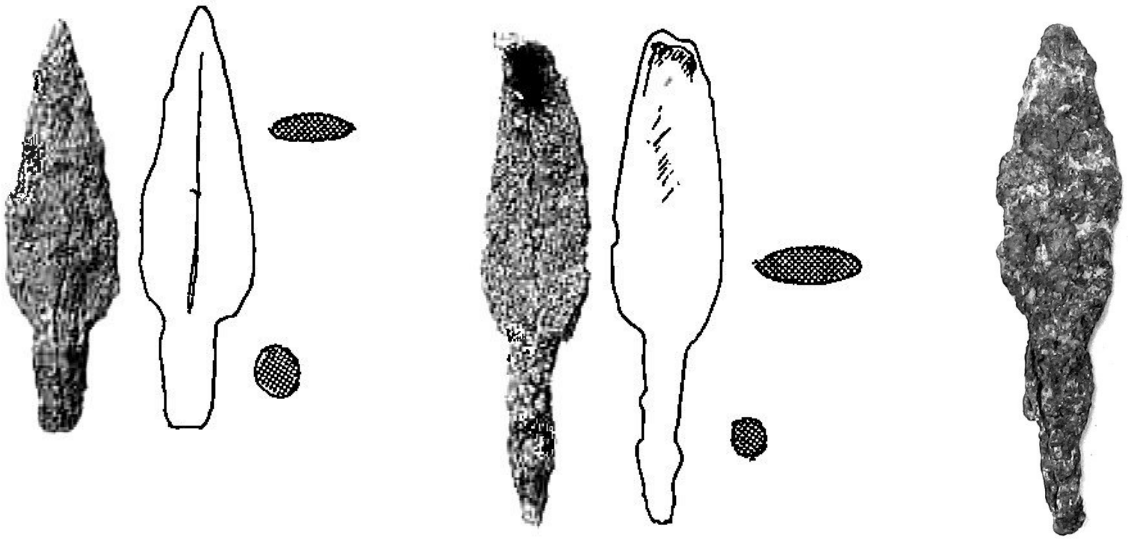
Sources:

Site	No.	Type	Item No.	Source
Lachish	343	5b-1	61020/60	Gottlieb 2004, p. 1941, fig. 27.15:9
Lachish	37	5b-1	6830	Tufnell et al 1953, p. 119, pl. 60:25
Nimrud	36	5b-1	ND 10944	British Museum
Toprakkale	9	5b-1	319	Wartke 1990, p. 127, fig. 32d
Lachish	337	5b-1	61311/60	Gottlieb 2004, p. 1941, fig. 27.15:3
Uruk	2	5b-1	W 20128,1. 2	van Ess & Pedde 1992, p. 67, no. 748
Nimrud	37	5b-1	ND 10944	British Museum
Lachish	285	5b-1	61275/60	Gottlieb 2004, p. 1935, fig. 27.12:11

Type 5b-1 (continued)



Uruk 5 Nimrud 8 Lachish 283

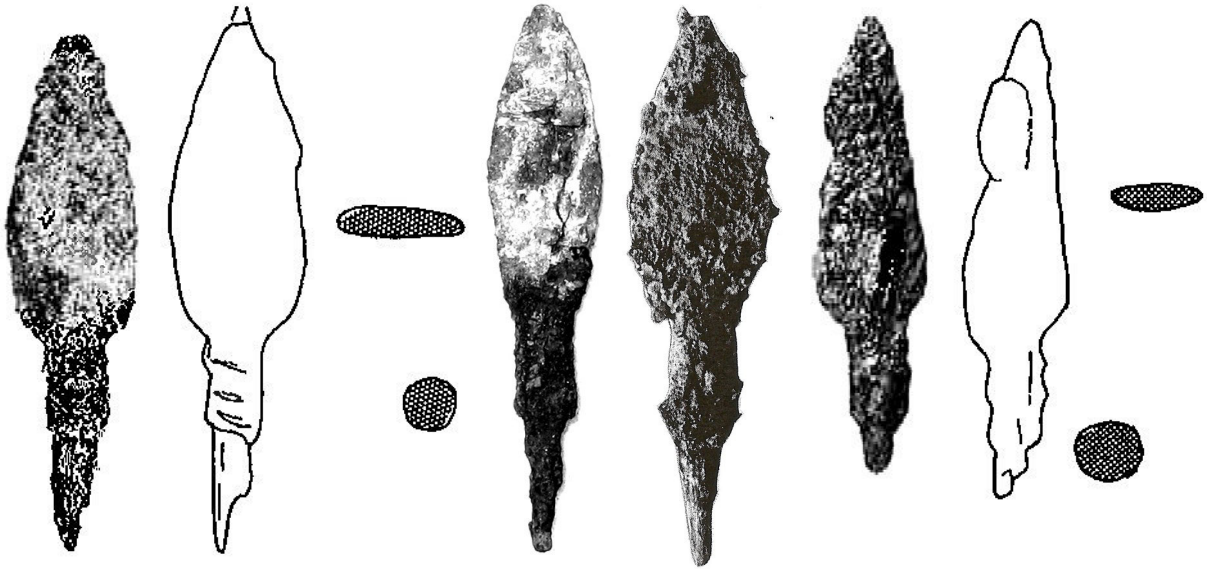


Lachish 315 Lachish 326 Nimrud 1

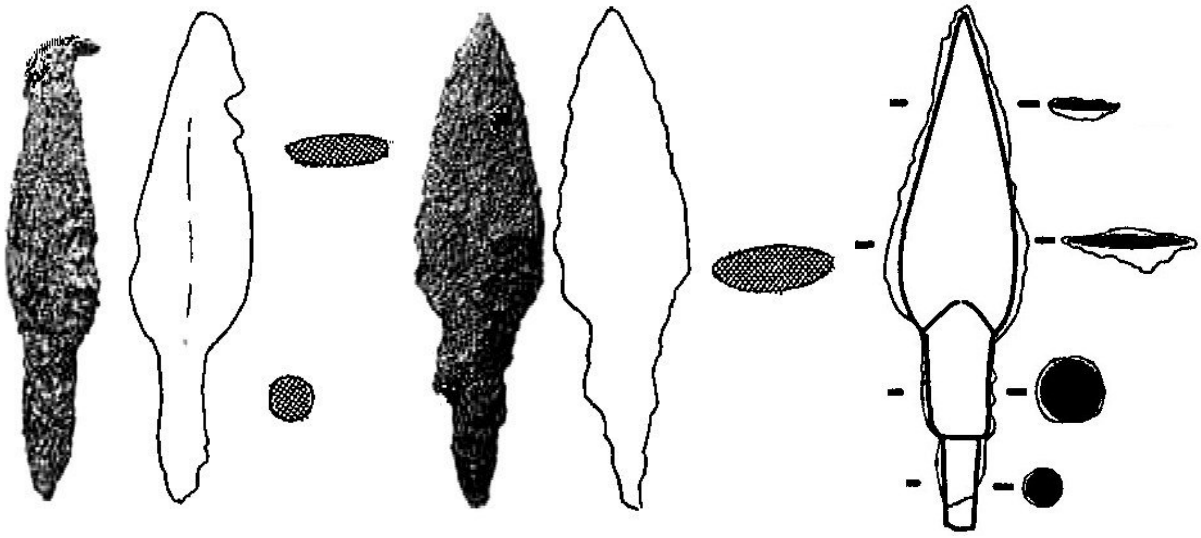
Sources:

Site	No.	Type	Item No.	Source
Uruk	5	5b-1	W 21894,3	van Ess & Pedde 1992, p. 68, no. 750
Nimrud	8	5b-1	ND 10944	British Museum
Lachish	283	5b-1	61806/60	Gottlieb 2004, p. 1935, fig. 27.12:9
Lachish	315	5b-1	60620/60	Gottlieb 2004, p. 1937, fig. 27.13:23
Lachish	326	5b-1	61566/60	Gottlieb 2004, p. 1939, fig. 27.14:11
Nimrud	1	5b-1	ND 9268	British Museum

Type 5b-1 (continued)



Lachish 358 Nimrud 39 Uruk 1 Lachish 339

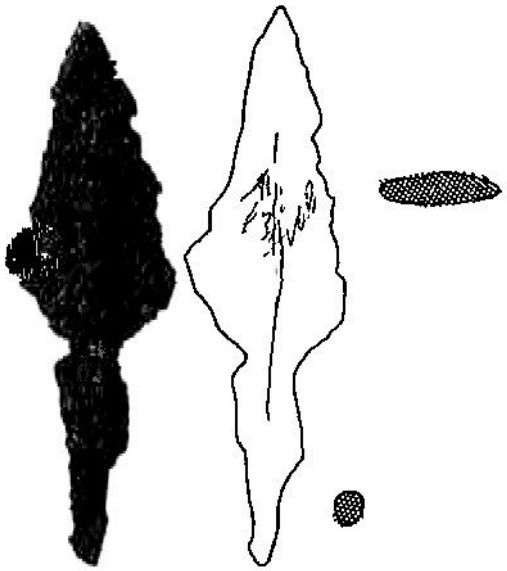


Lachish 328 Lachish 126 Hasanlu 25

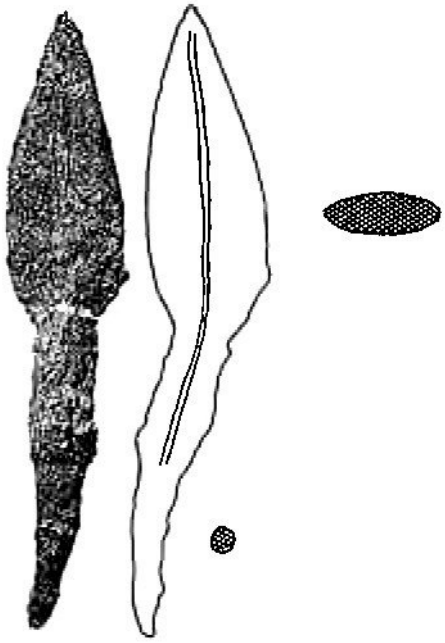
Sources:

Site	No.	Type	Item No.	Source
Lachish	358	5b-1	6229	Gottlieb 2004, p. 1945, fig. 27.17:9
Nimrud	39	5b-1	ND 10944	British Museum
Uruk	1	5b-1	W 20128,1. 2	van Ess & Pedde 1992, p. 67, no. 748
Lachish	339	5b-1	60721/60	Gottlieb 2004, p. 1941, fig. 27.15:5
Lachish	328	5b-1	60677/60	Gottlieb 2004, p. 1939, fig. 27.14:13
Lachish	126	5b-1	10520/60	Gottlieb 2004, p. 1919, fig. 27.4:3
Hasanlu	25	5b-1	HAS 62-1043 a	Thornton & Pigott 2011, p. 142, fig. 6.3:8

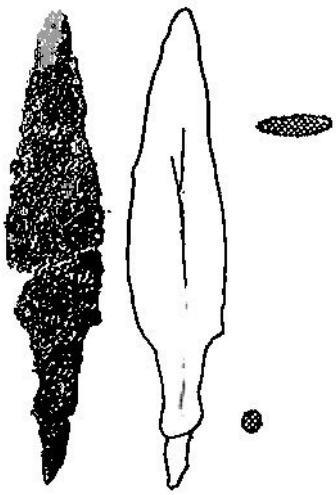
Type 5b-1 (continued)



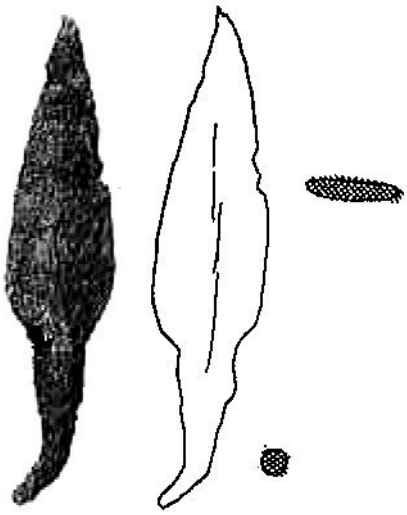
Lachish 300



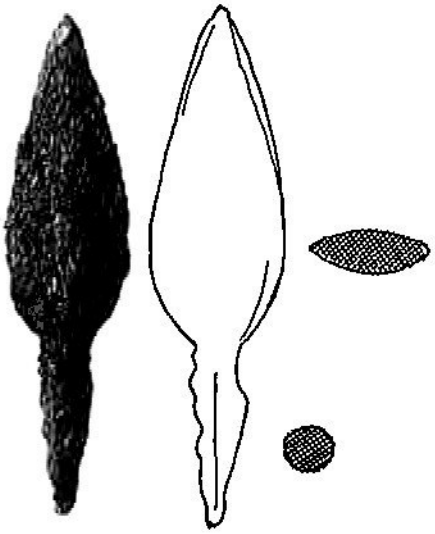
Lachish 284



Lachish 336



Lachish 312

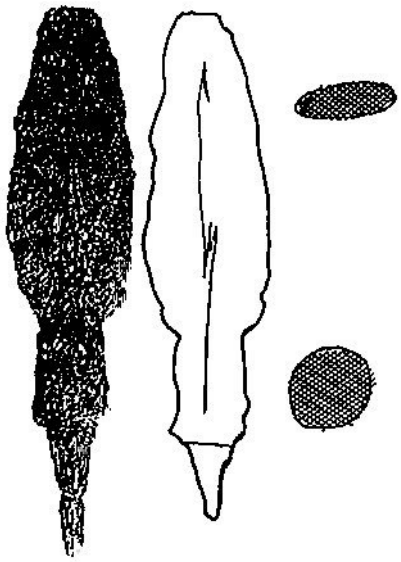


Lachish 128

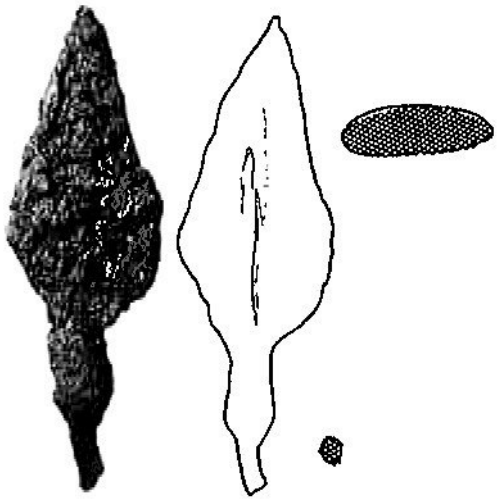
Sources:

Site	No.	Type	Item No.	Source
Lachish	300	5b-1	61975/60	Gottlieb 2004, p. 1937, fig. 27.13:6
Lachish	284	5b-1	61284/60	Gottlieb 2004, p. 1935, fig. 27.12:10
Lachish	336	5b-1	61828/60	Gottlieb 2004, p. 1941, fig. 27.15:2
Lachish	312	5b-1	61916/60	Gottlieb 2004, p. 1937, fig. 27.13:19
Lachish	128	5b-1	31399/60	Gottlieb 2004, p. 1919, fig. 27.4:5

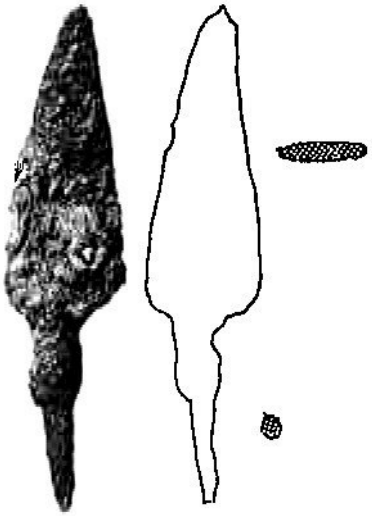
Type 5b-1 (continued)



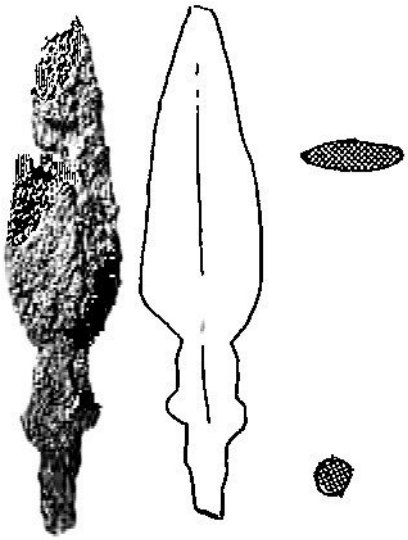
Lachish 282



Lachish 299



Lachish 297



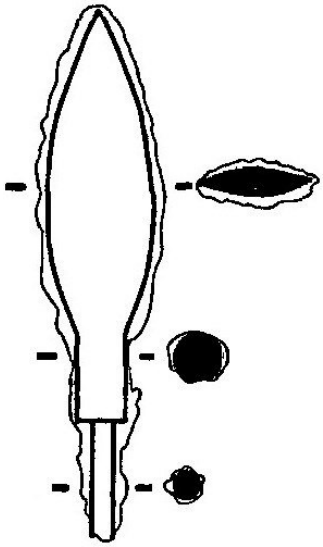
Lachish 319

Nimrud 7

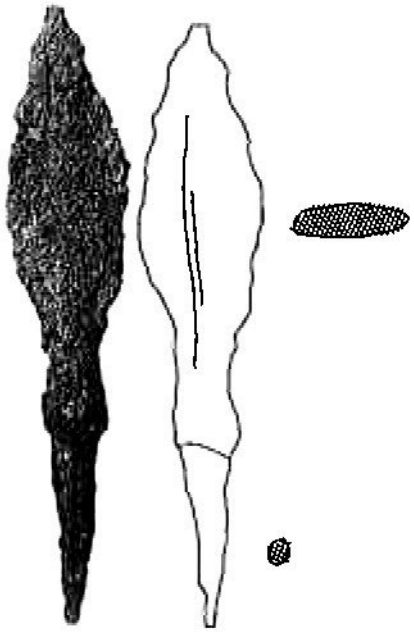
Sources:

Site	No.	Type	Item No.	Source
Lachish	282	5b-1	61125/60	Gottlieb 2004, p. 1935, fig. 27.12:8
Lachish	299	5b-1	61981/60	Gottlieb 2004, p. 1937, fig. 27.13:5
Lachish	297	5b-1	60823/60	Gottlieb 2004, p. 1937, fig. 27.13:3
Lachish	319	5b-1	61693	Gottlieb 2004, p. 1939, fig. 27.14:3
Nimrud	7	5b-1	ND 10944	British Museum

Type 5b-1 (continued)

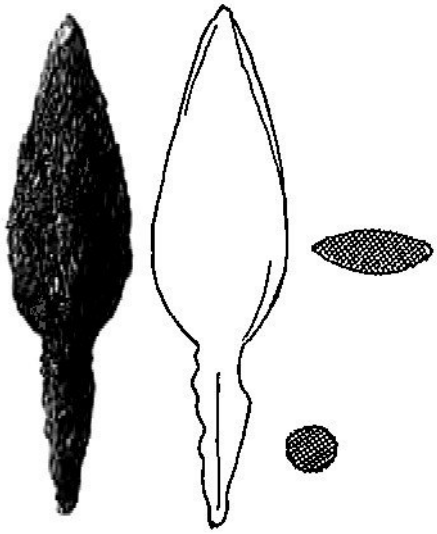


Hasanlu 28

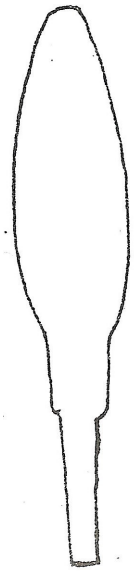


Lachish 280

Sialk47



Lachish 127



Gerar 85

Nimrud 2

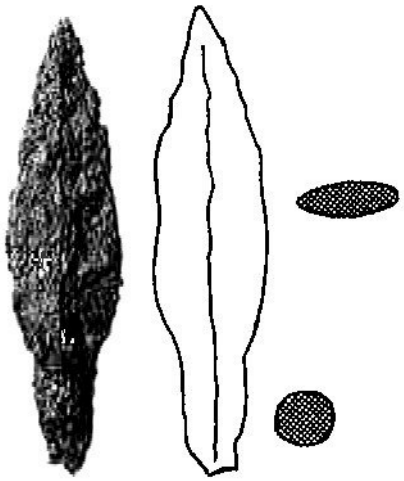
Nimrud 231

Sources:

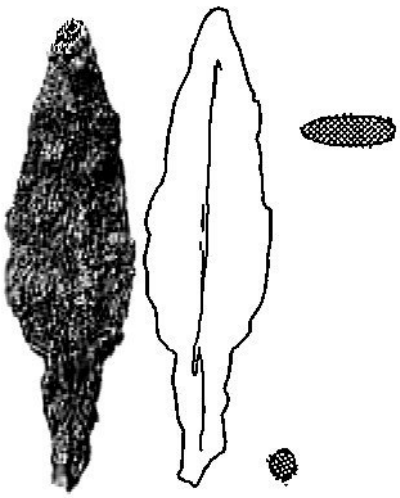
Site	No.	Type	Item No.	Source
Hasanlu	28	5b-1	HAS 62-156	Thornton & Pigott 2011, p. 142, fig. 6.3:11
Lachish	280	5b-1	62042/60	Gottlieb 2004, p. 1935, fig. 27.12:6
Sialk	47	5b-1	S 923d, b	Ghirshman 1939, vol. 2, p. 244, pl. 75
Lachish	127	5b-1	31290/60	Gottlieb 2004, p. 1919, fig. 27.4:4
Gerar	85	5b-1	pl. 29:70	Petrie 1928, pl. 29:70
Nimrud	2	5b-1	ND 9268	British Museum
Nimrud	231	5b-1	ND 9268	British Museum

Type 5b-1 (continued)

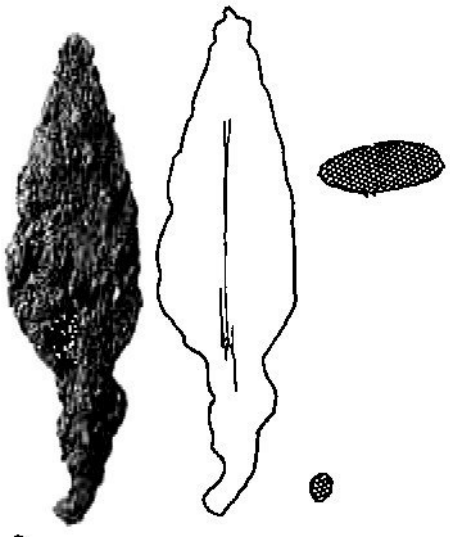
Nimrud 9



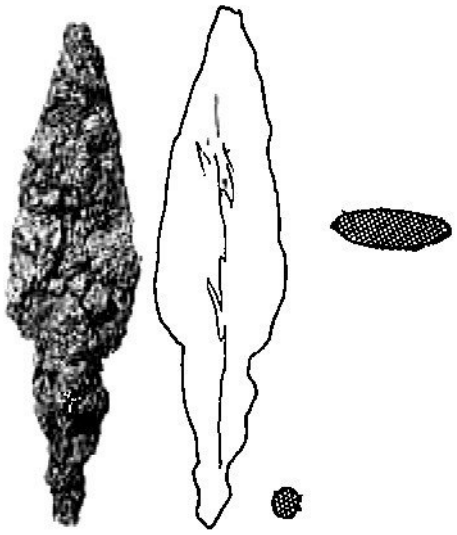
Lachish 342



Lachish 268



Lachish 304

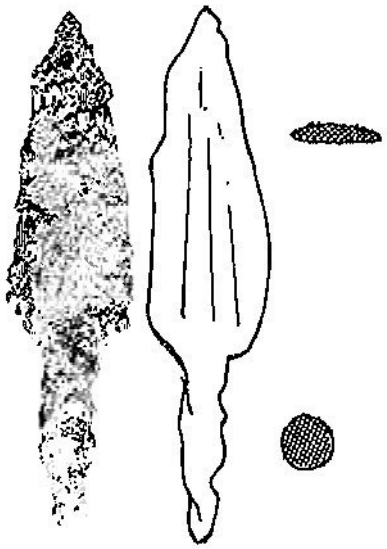


Lachish 307

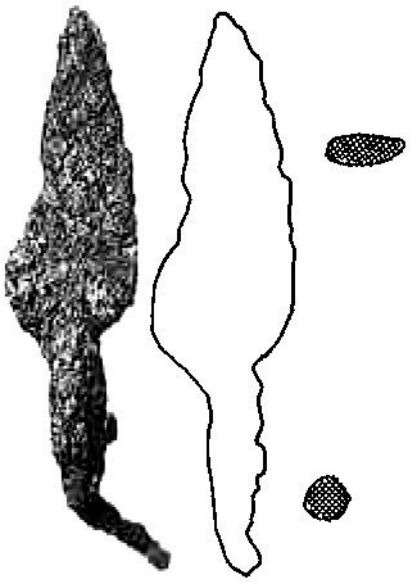
Sources:

Site	No.	Type	Item No.	Source
Nimrud	9	5b-1	ND 10944	British Museum
Lachish	342	5b-1	60366/60	Gottlieb 2004, p. 1941, fig. 27.15:8
Lachish	268	5b-1	60785/60	Gottlieb 2004, p. 1933, fig. 27.11:11
Lachish	304	5b-1	60921/60	Gottlieb 2004, p. 1937, fig. 27.13:10
Lachish	307	5b-1	61652/60	Gottlieb 2004, p. 1937, fig. 27.13:14

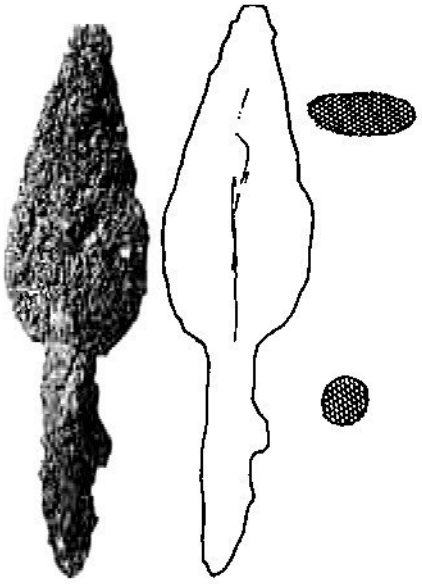
Type 5b-1 (continued)



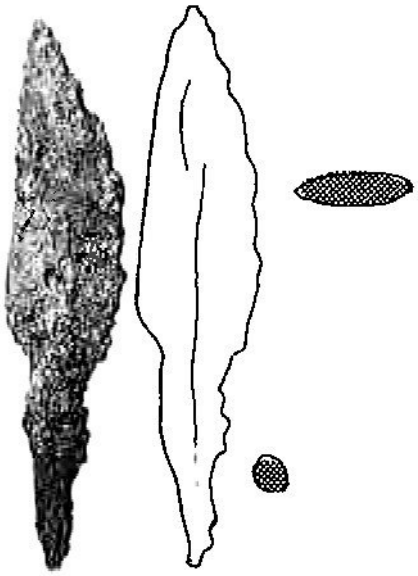
Lachish 366



Lachish 286



Lachish 302

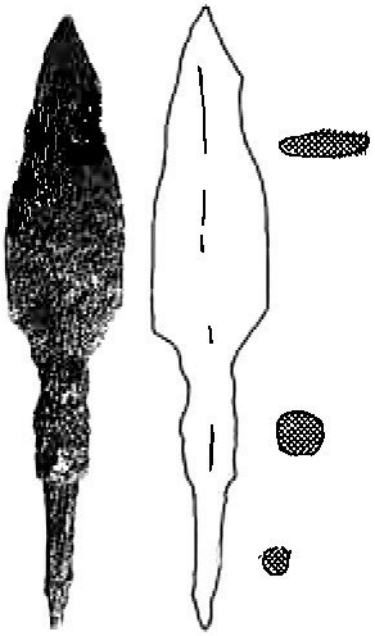


Lachish 320

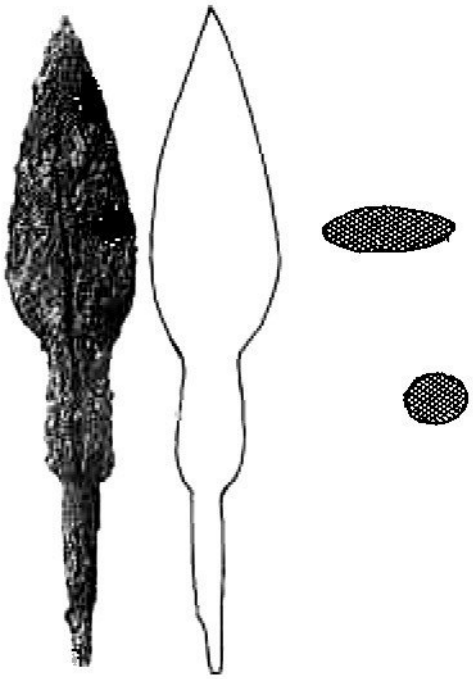
Sources:

Site	No.	Type	Item No.	Source
Lachish	366	5b-1	5481	Gottlieb 2004, p. 1949, fig. 27.19:3
Lachish	286	5b-1	61334/60	Gottlieb 2004, p. 1935, fig. 27.12:12
Lachish	302	5b-1	61755/60	Gottlieb 2004, p. 1937, fig. 27.13:8
Lachish	320	5b-1	60674/60	Gottlieb 2004, p. 1939, fig. 27.14:4

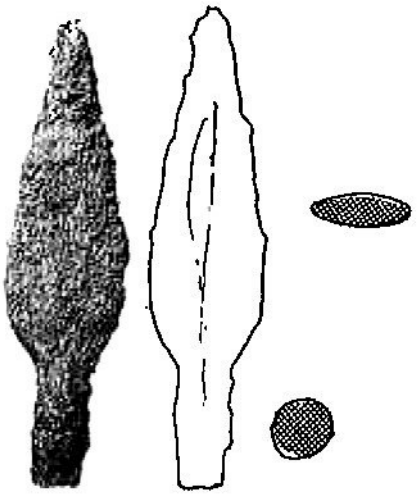
Type 5b-1 (continued)



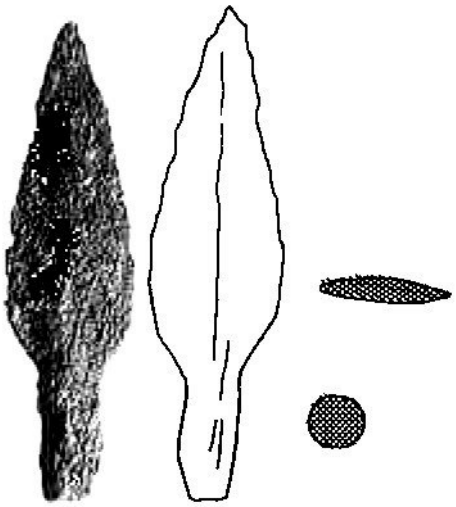
Lachish 281



Lachish 116



Lachish 332

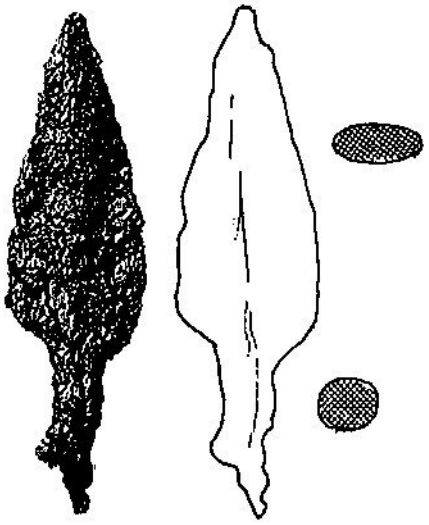


Lachish 334

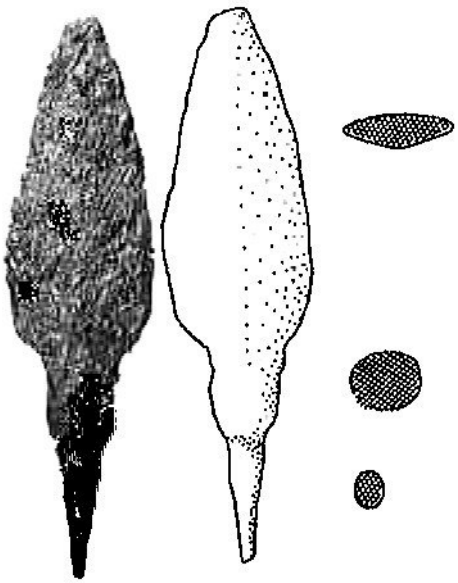
Sources:

Site	No.	Type	Item No.	Source
Lachish	281	5b-1	60605/60	Gottlieb 2004, p. 1935, fig. 27.12:7
Lachish	116	5b-1	39097/60	Gottlieb 2004, p. 1917, fig. 27.3:10
Lachish	332	5b-1	61598/60	Gottlieb 2004, p. 1939, fig. 27.14:17
Lachish	334	5b-1	60846/60	Gottlieb 2004, p. 1939, fig. 27.14:20

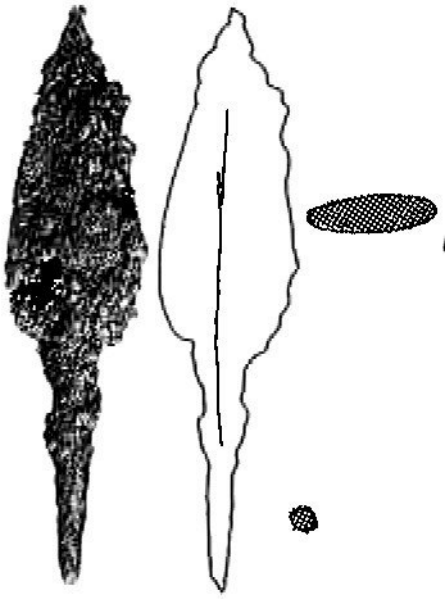
Type 5b-1 (continued)



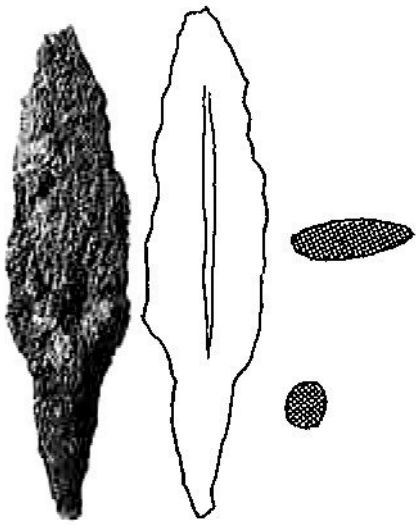
Lachish 244



Lachish 115



Lachish 230



Lachish 232

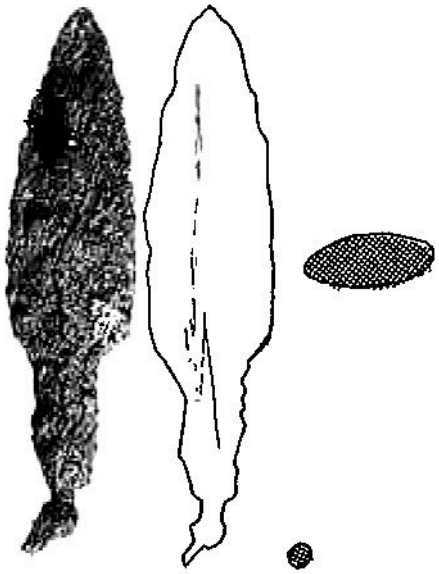
Igdyr 2

Sources:

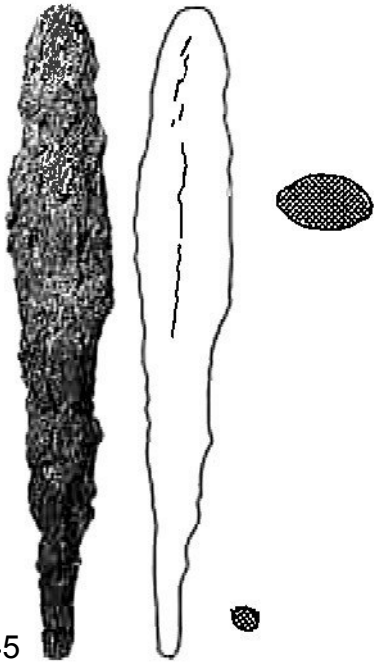
Site	No.	Type	Item No.	Source
Lachish	244	5b-1	61856/60	Gottlieb 2004, p. 1931, fig. 27.10:5
Lachish	115	5b-1	10189/60	Gottlieb 2004, p. 1917, fig. 27.3:9
Lachish	230	5b-1	61131/60	Gottlieb 2004, p. 1929, fig. 27.9:8
Lachish	232	5b-1	62116/60	Gottlieb 2004, p. 1929, fig. 27.9:10
Igdyr	2	5b-1	fig. 37:5	Barnett 1963, p. 186; fig. 37:5

Type 5b-1 (continued)

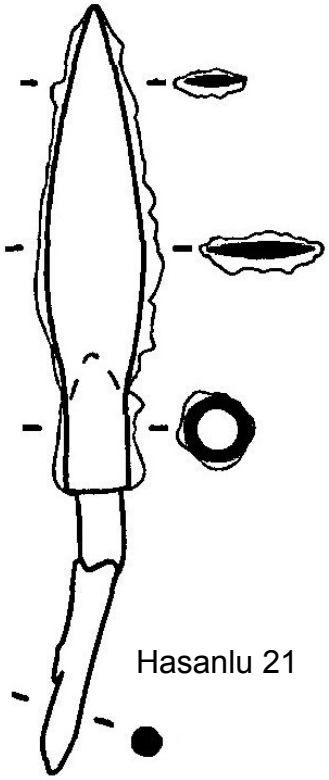
Nimrud 31



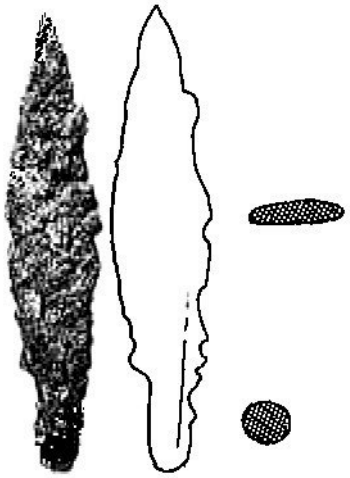
Lachish 245



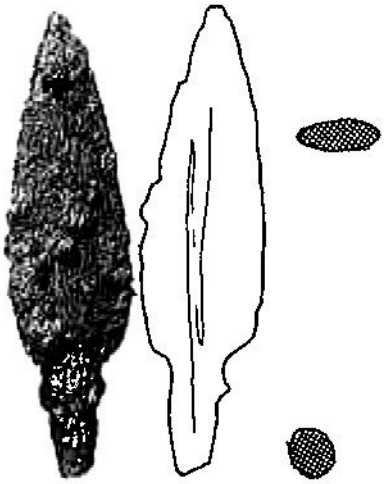
Lachish 145



Hasanlu 21



Lachish 207



Lachish 331

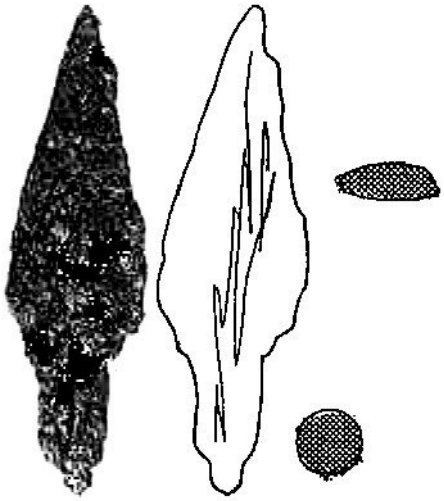
Sources:

Site	No.	Type	Item No.	Source
Nimrud	31	5b-1	ND 10944	British Museum
Lachish	245	5b-1	61342/60	Gottlieb 2004, p. 1931, fig. 27.10:6
Lachish	145	5b-1	60648/60	Gottlieb 2004, p. 1921, fig. 27.5:3
Hasanlu	21	5b-1	HAS 72-N136 a	Thornton & Pigott 2011, p. 142, fig. 6.3:4
Lachish	207	5b-1	60607/60	Gottlieb 2004, p. 1927, fig. 27.8:6
Lachish	331	5b-1	60710/60	Gottlieb 2004, p. 1939, fig. 27.14:16

Plate 128

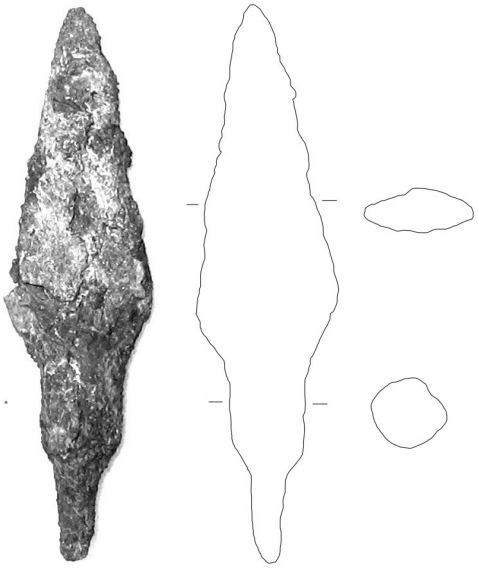
Type 5b-1 (continued)

Igdyr 3

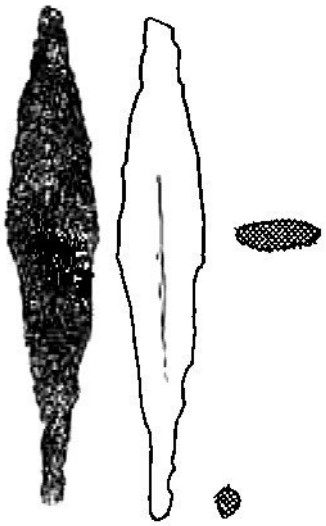


Lachish 333

Nimrud 34



Nimrud 10

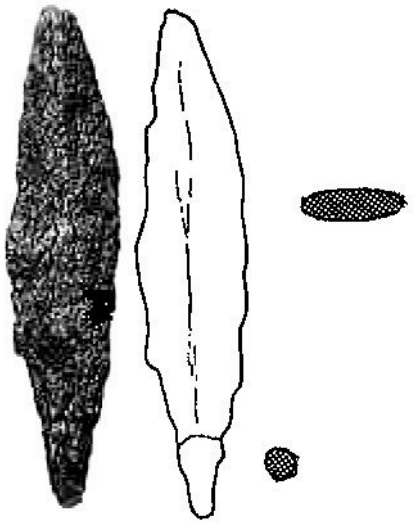


Lachish 199

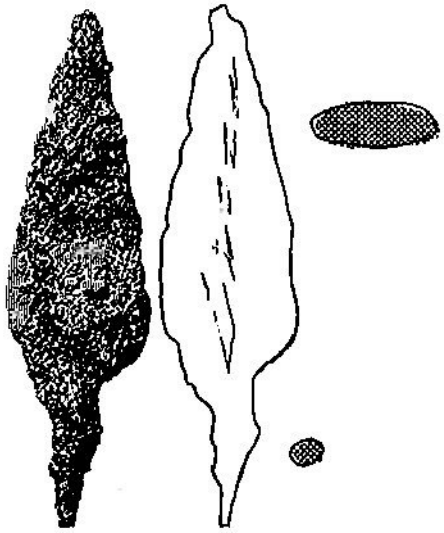
Sources:

Site	No.	Type	Item No.	Source
Igdyr	3	5b-1	fig. 37:6	Barnett 1963, p. 186; fig. 37:6
Lachish	333	5b-1	60572/60	Gottlieb 2004, p. 1939, fig. 27.14:18
Nimrud	34	5b-1	ND 10944	British Museum
Nimrud	10	5b-1	ND 10944	British Museum
Lachish	199	5b-1	61607/60	Gottlieb 2004, p. 1925, fig. 27.7:18

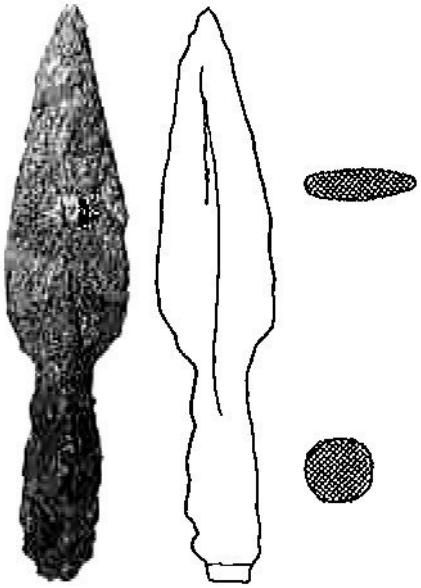
Type 5b-1 (continued)



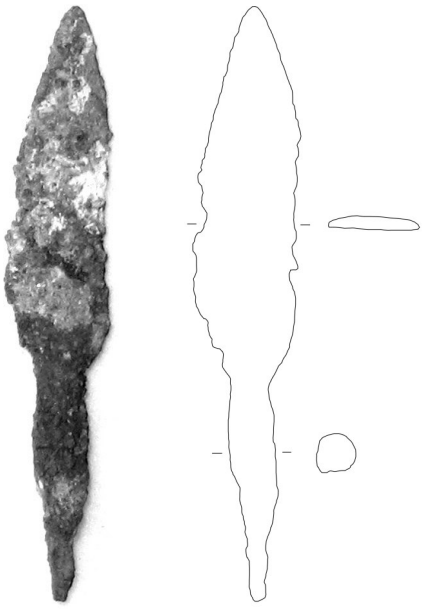
Lachish 209



Lachish 253



Lachish 261



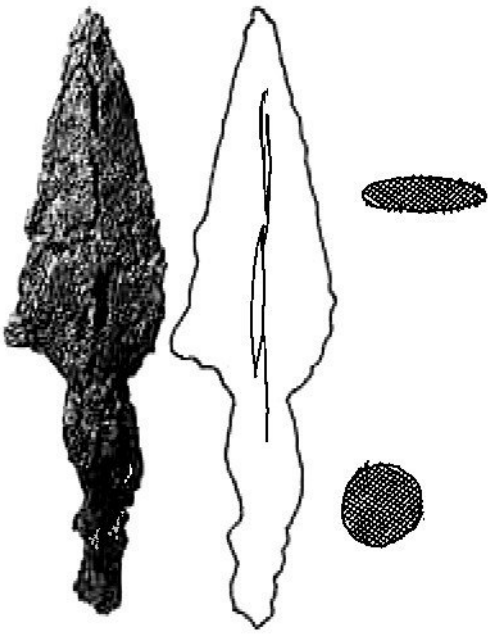
Nimrud 12

Sources:

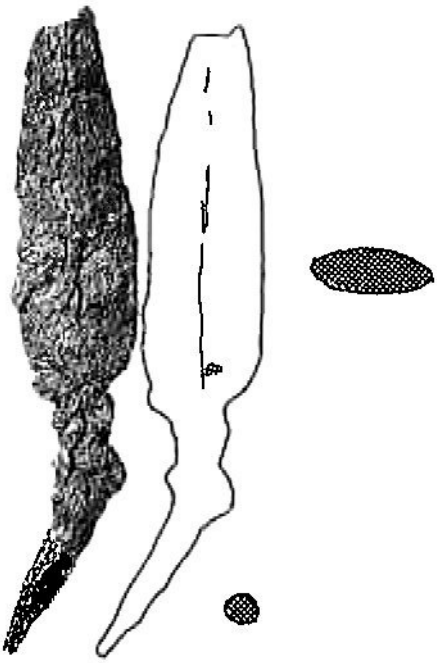
Site	No.	Type	Item No.	Source
Lachish	209	5b-1	61367/60	Gottlieb 2004, p. 1927, fig. 27.8:8
Lachish	253	5b-1	61411/60	Gottlieb 2004, p. 1931, fig. 27.10:14
Lachish	261	5b-1	60691/60	Gottlieb 2004, p. 1933, fig. 27.11:4
Nimrud	12	5b-1	ND 10944	British Museum

Plate 130

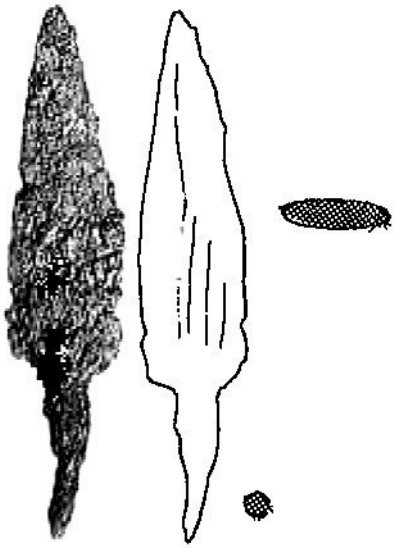
Type 5b-1 (continued)



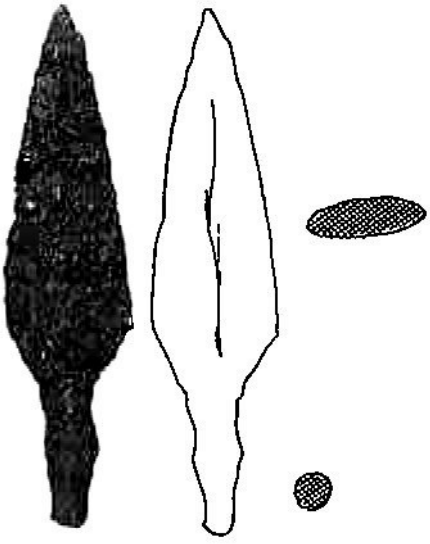
Lachish 279



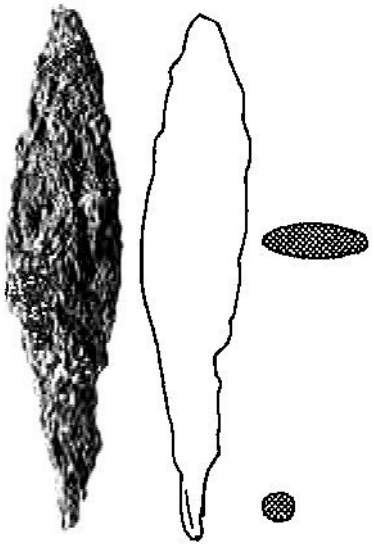
Lachish 291



Lachish 250



Lachish 238



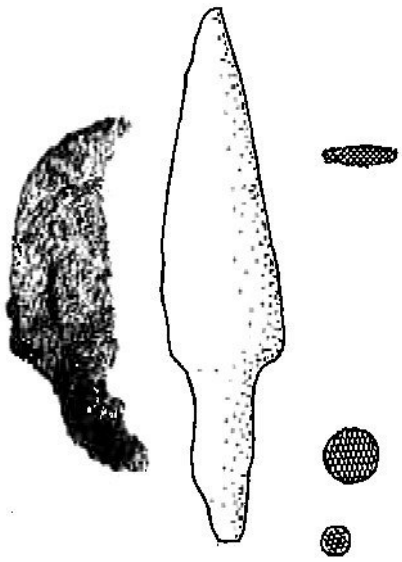
Lachish 97

Sources:

Site	No.	Type	Item No.	Source
Lachish	279	5b-1	62028/60	Gottlieb 2004, p. 1935, fig. 27.12:5
Lachish	291	5b-1	60604/60	Gottlieb 2004, p. 1935, fig. 27.12:17
Lachish	250	5b-1	61257/60	Gottlieb 2004, p. 1931, fig. 27.10:11
Lachish	238	5b-1	60375/60	Gottlieb 2004, p. 1929, fig. 27.9:16
Lachish	97	5b-1	31801/67	Gottlieb 2004, p. 1915, fig. 27.2:7

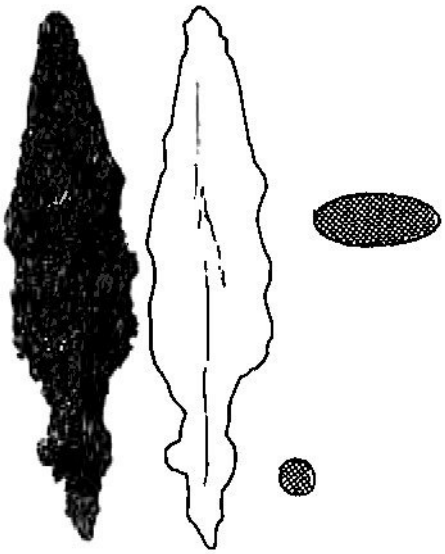
Plate 131

Type 5b-1 (continued)

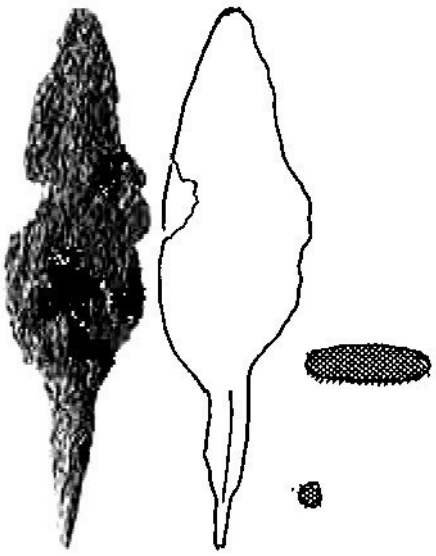


Lachish 131

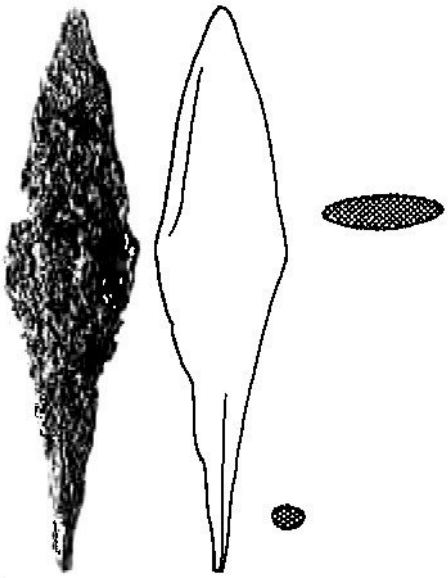
Nimrud 11



Lachish 217



Lachish 98

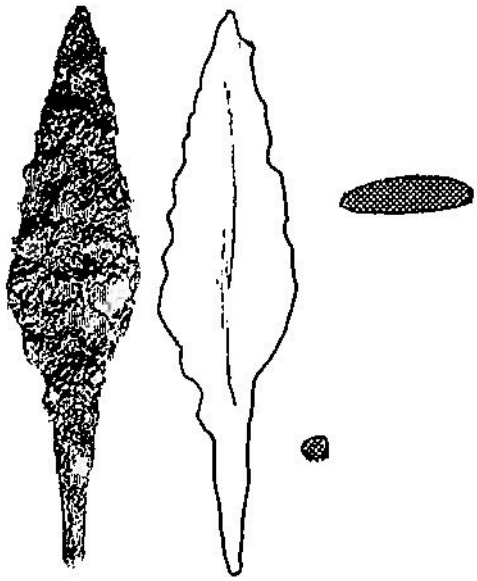


Lachish 102

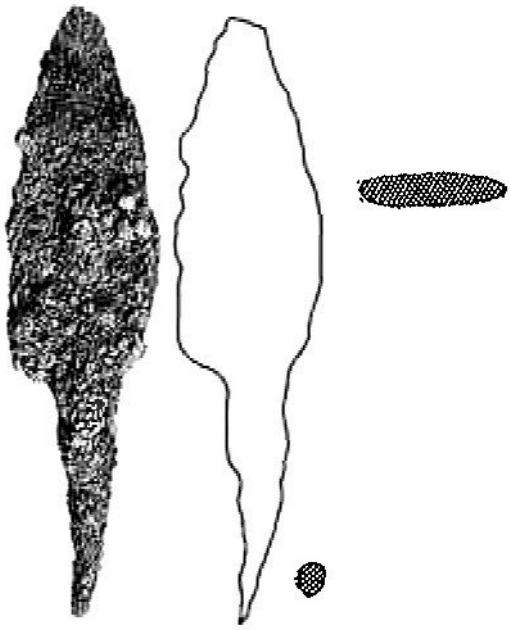
Sources:

Site	No.	Type	Item No.	Source
Lachish	131	5b-1	10852/60	Gottlieb 2004, p. 1919, fig. 27.4:8
Nimrud	11	5b-1	ND 10944	British Museum
Lachish	217	5b-1	61923/60	Gottlieb 2004, p. 1927, fig. 27.8:16
Lachish	98	5b-1	31801/62	Gottlieb 2004, p. 1915, fig. 27.2:8
Lachish	102	5b-1	10873/60	Gottlieb 2004, p. 1915, fig. 27.2:12

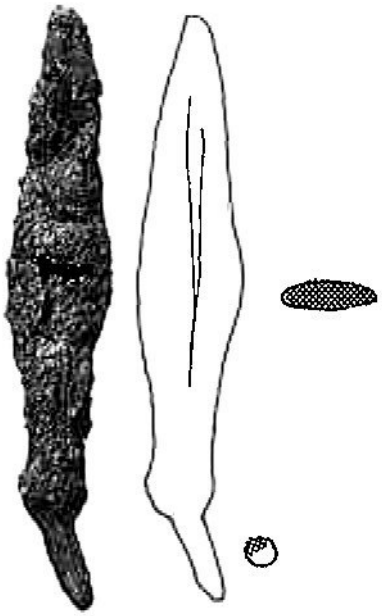
Type 5b-1 (continued)



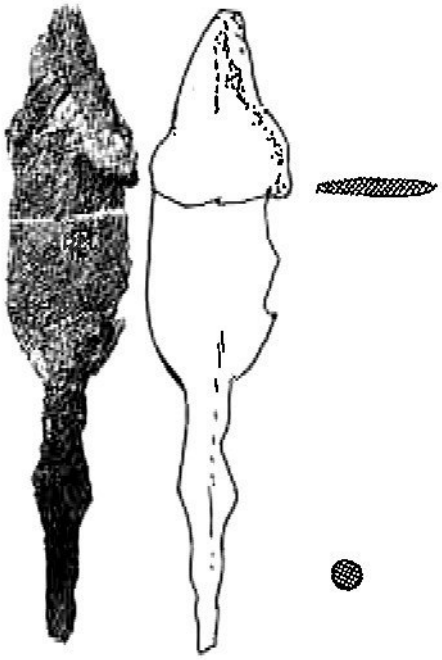
Lachish 247



Lachish 260



Lachish 292



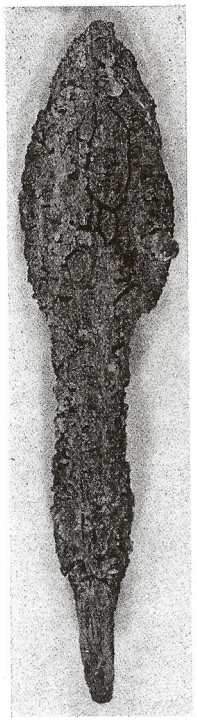
Lachish 259

Sources:

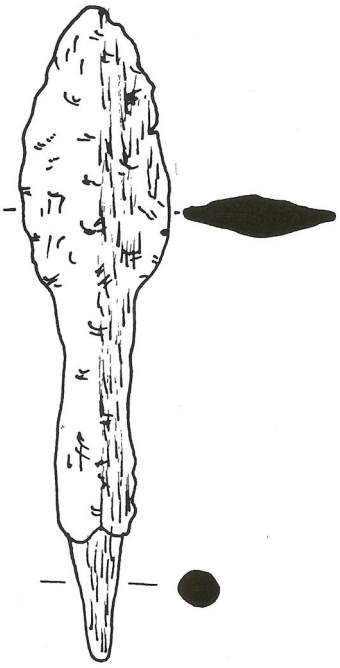
Site	No.	Type	Item No.	Source
Lachish	247	5b-1	62262	Gottlieb 2004, p. 1931, fig. 27.10:8
Lachish	260	5b-1	61424/60	Gottlieb 2004, p. 1933, fig. 27.11:3
Lachish	292	5b-1	62186/60	Gottlieb 2004, p. 1935, fig. 27.12:18
Lachish	259	5b-1	60585/60	Gottlieb 2004, p. 1933, fig. 27.11:2

Plate 133

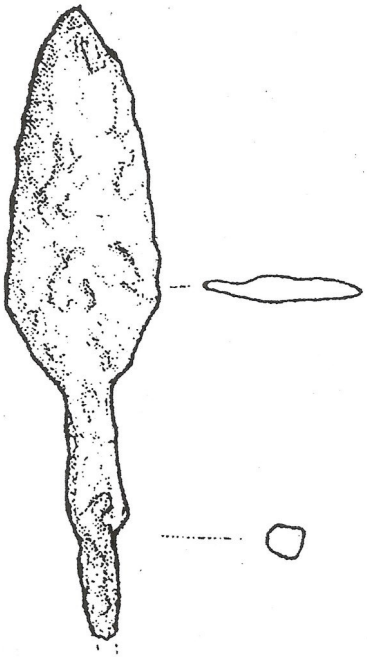
Type 5b-1 (continued)



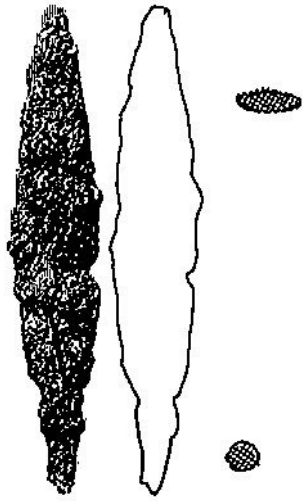
Uruk 4



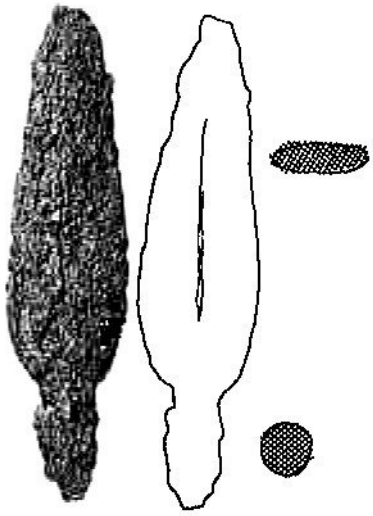
Sialk 46



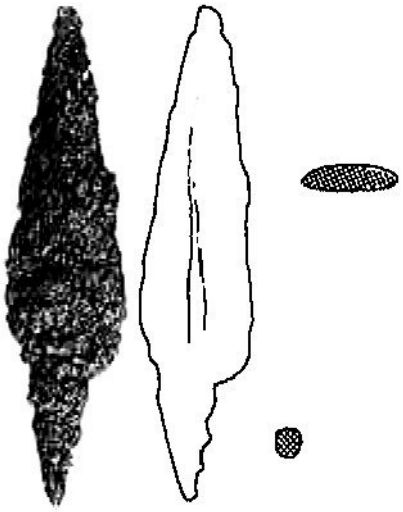
Ayanis 43



Lachish 204



Lachish 267



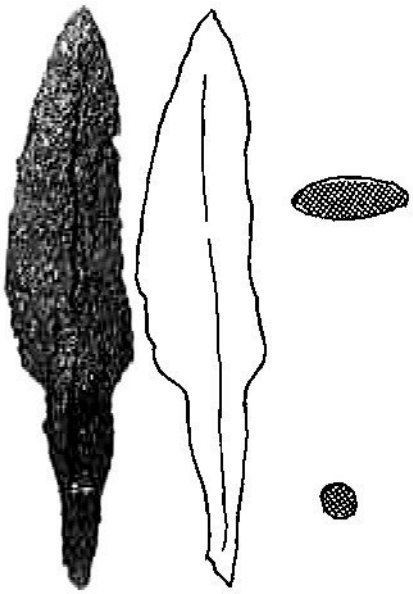
Lachish 251

Sources:

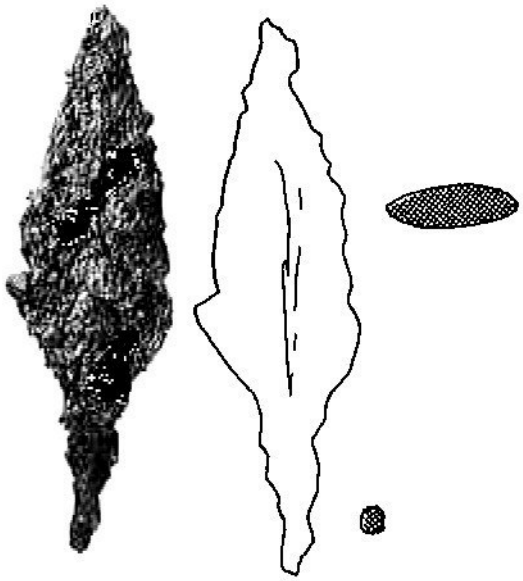
Site	No.	Type	Item No.	Source
Uruk	4	5b-1!	W 21894,3	van Ess & Pedde 1992, p. 68, no. 750
Sialk	46	5b-1	S 923d, a	Ghirshman 1939, vol. 2, p. 244, pl. 75
Ayanis	43	5b-1	43	Derın & Muscarella 2001, fig. 4
Lachish	204	5b-1	61211/60	Gottlieb 2004, p. 1927, fig. 27.8:3
Lachish	267	5b-1	60515/60	Gottlieb 2004, p. 1933, fig. 27.11:10
Lachish	251	5b-1	61422/60	Gottlieb 2004, p. 1931, fig. 27.10:12

Plate 134

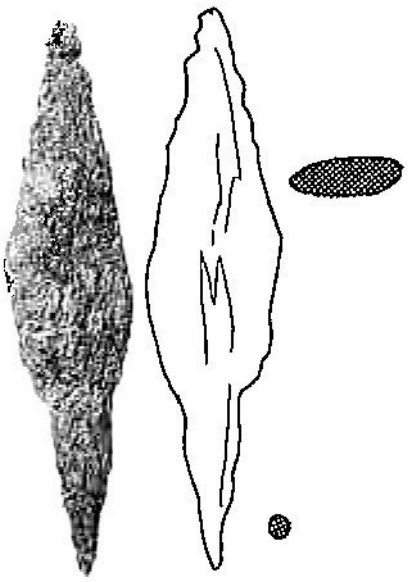
Type 5b-1 (continued)



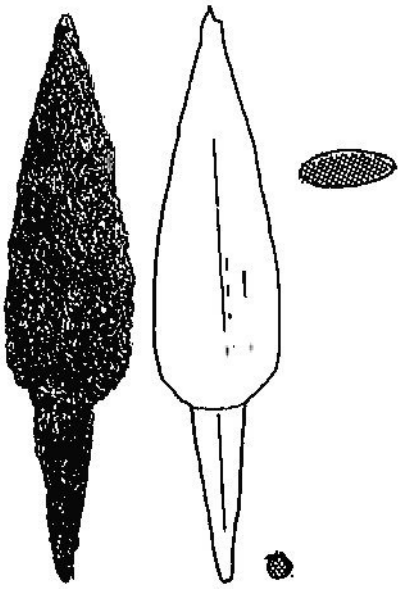
Lachish 114



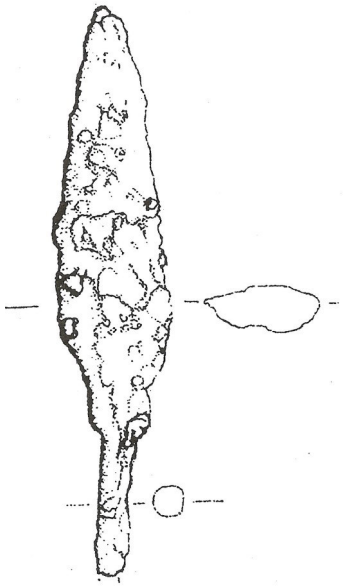
Lachish 226



Lachish 184



Lachish 233

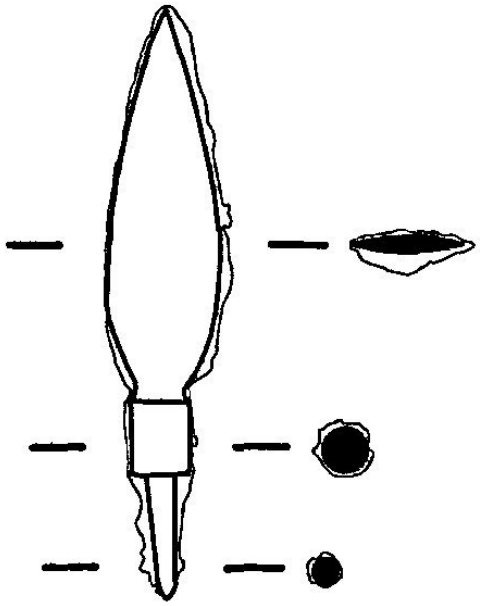


Ayanis 30

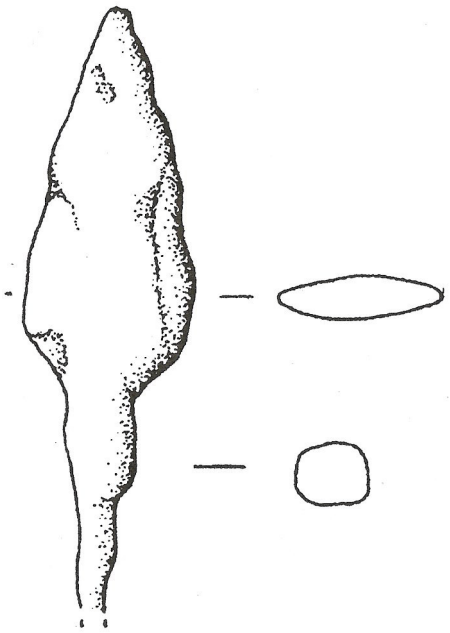
Sources:

Site	No.	Type	Item No.	Source
Lachish	114	5b-1	10245/60	Gottlieb 2004, p. 1917, fig. 27.3:8
Lachish	226	5b-1	61972/60	Gottlieb 2004, p. 1929, fig. 27.9:4
Lachish	184	5b-1	61368/60	Gottlieb 2004, p. 1925, fig. 27.7:3
Lachish	233	5b-1	60634/60	Gottlieb 2004, p. 1929, fig. 27.9:11
Ayanis	30	5b-1	30	Derın & Muscarella 2001, fig. 3

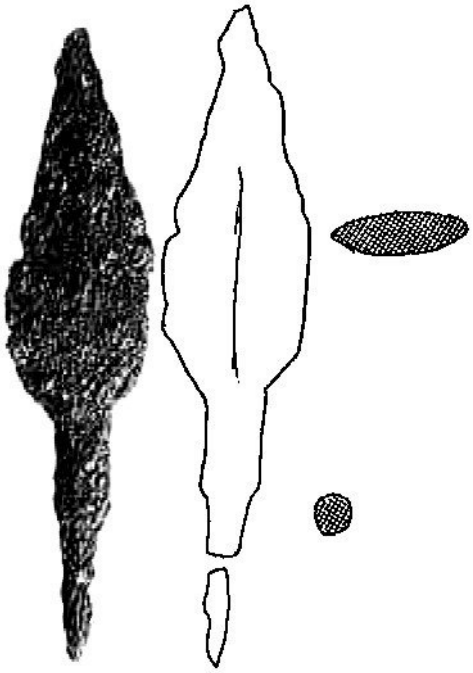
Type 5b-1 (continued)



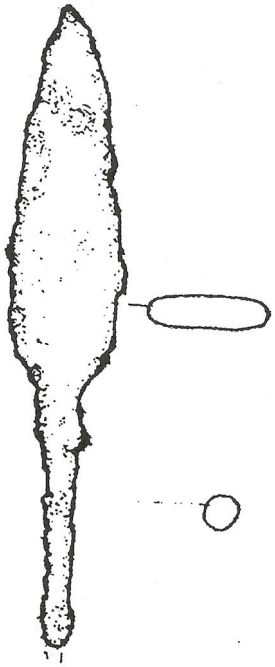
Hasanlu 26



Ayanis 46



Lachish 228

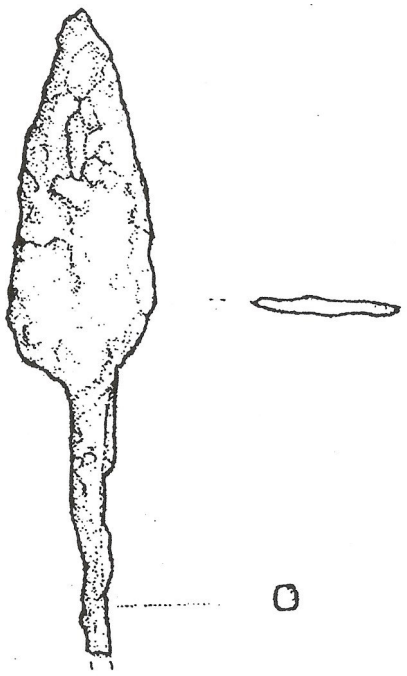


Ayanis 41

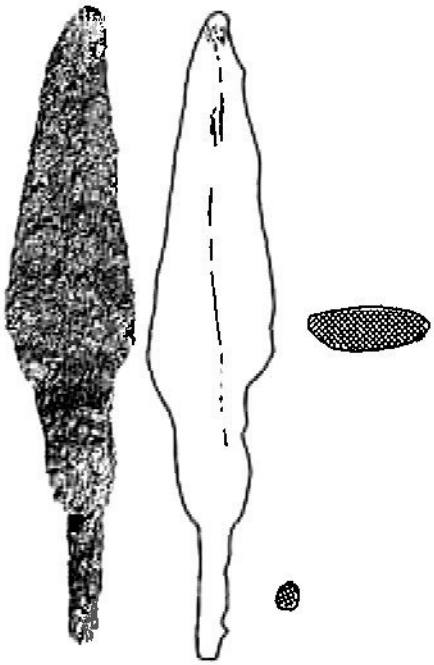
Sources:

Site	No.	Type	Item No.	Source
Hasanlu	26	5b-1	HAS 72-N116 L	Thornton & Pigott 2011, p. 142, fig. 6.3:9
Ayanis	46	5b-1	46	Derın & Muscarella 2001, fig. 4
Lachish	228	5b-1	61250/60	Gottlieb 2004, p. 1929, fig. 27.9:6
Ayanis	41	5b-1	41	Derın & Muscarella 2001, fig. 4

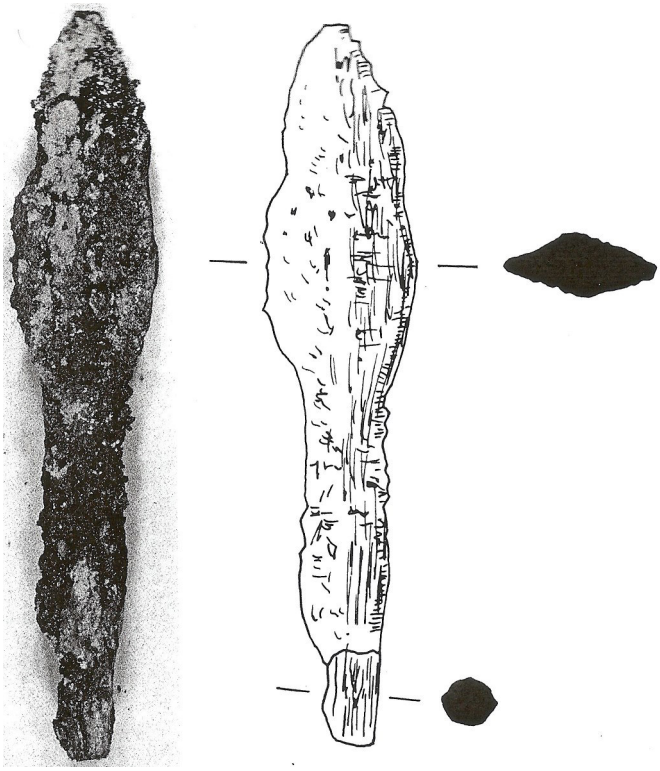
Type 5b-1 (continued)



Ayanis 42



Lachish 288



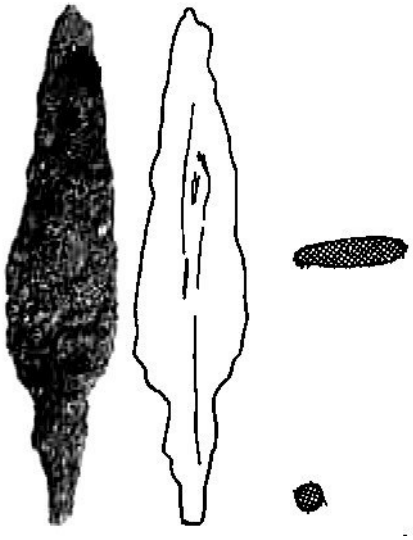
Uruk 6

Toprakkale 8

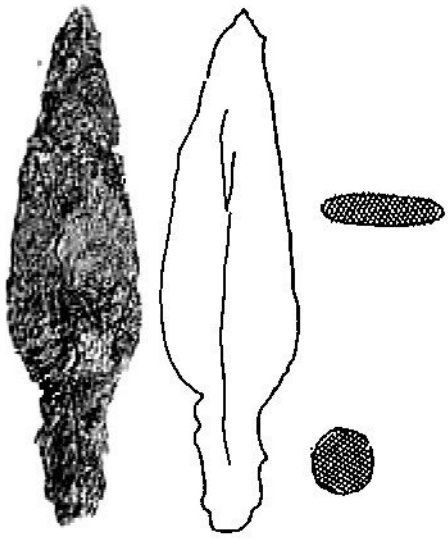
Sources:

Site	No.	Type	Item No.	Source
Ayanis	42	5b-1	42	Derın & Muscarella 2001, fig. 4
Lachish	288	5b-1	61976/60	Gottlieb 2004, p. 1935, fig. 27.12:14
Uruk	6	5b-1!	W 21898, 1	van Ess & Pedde 1992, p. 68, no. 751
Toprakkale	8	5b-1	314	Wartke 1990, pl. 39:b.2

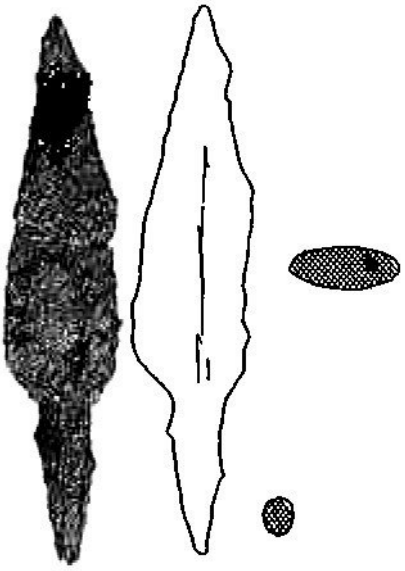
Type 5b-1 (continued)



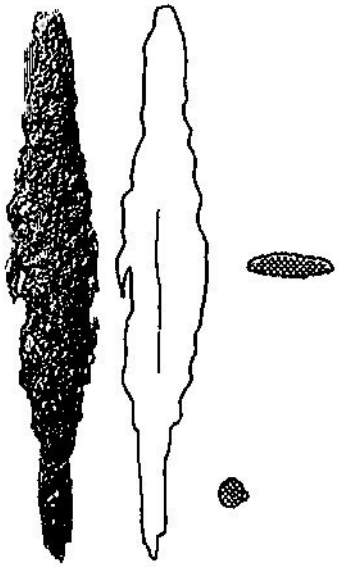
Lachish 311



Lachish 266



Lachish 231

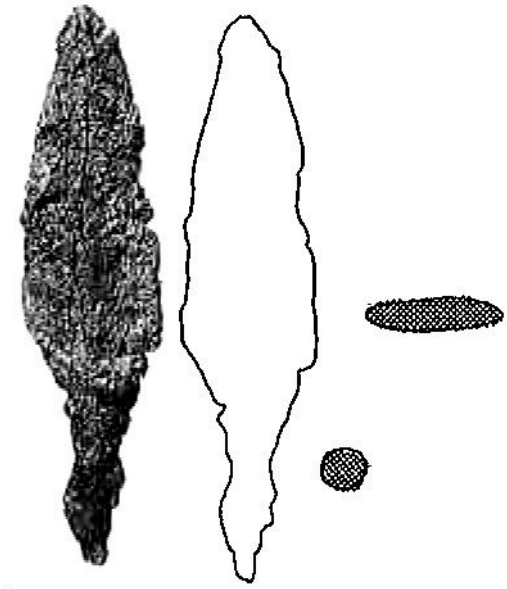


Lachish 203

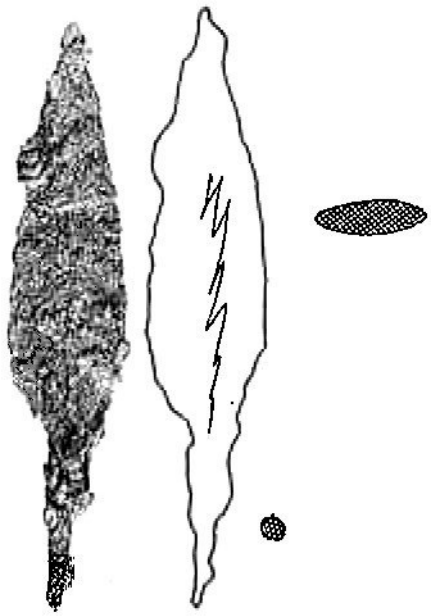
Sources:

Site	No.	Type	Item No.	Source
Lachish	311	5b-1	61413/60	Gottlieb 2004, p. 1937, fig. 27.13:18
Lachish	266	5b-1	60672/60	Gottlieb 2004, p. 1933, fig. 27.11:9
Lachish	231	5b-1	61603/60	Gottlieb 2004, p. 1929, fig. 27.9:9
Lachish	203	5b-1	61498/60	Gottlieb 2004, p. 1927, fig. 27.8:2

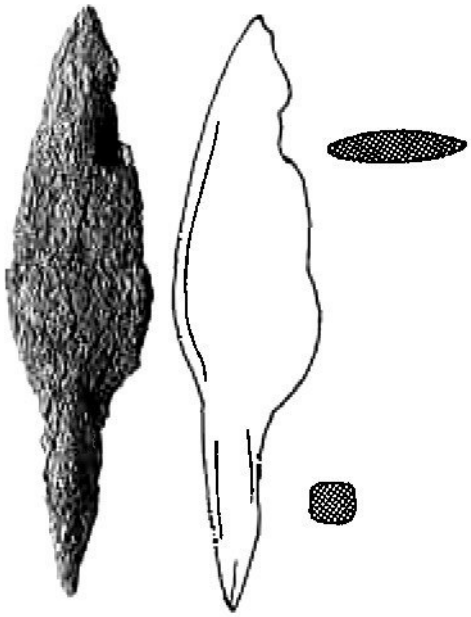
Type 5b-1 (continued)



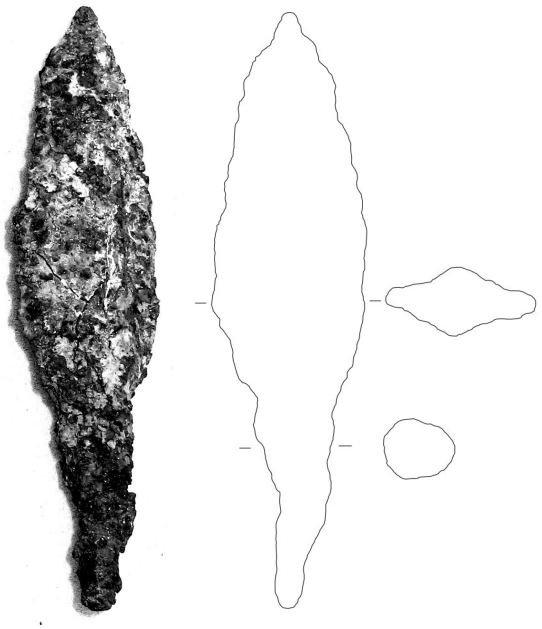
Lachish 252



Lachish 236



Lachish 123

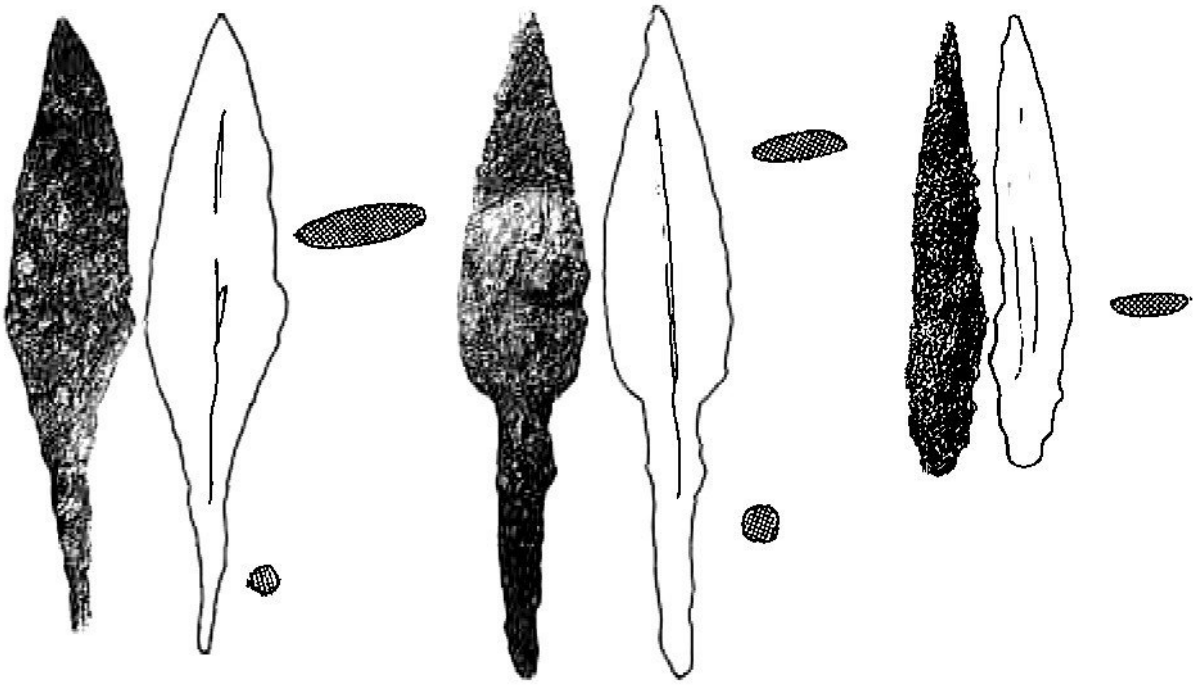


Nimrud 232

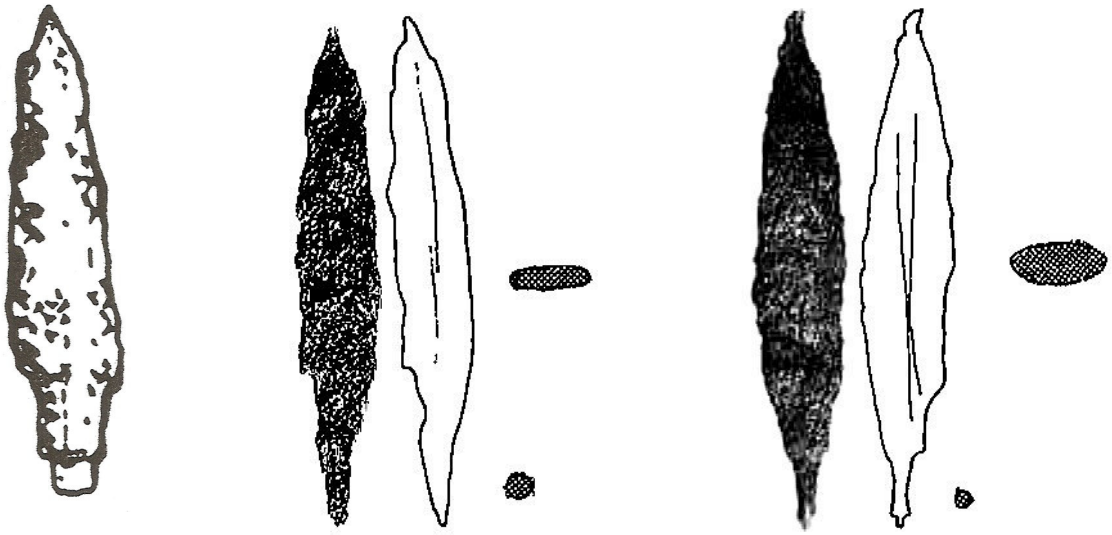
Sources:

Site	No.	Type	Item No.	Source
Lachish	252	5b-1	62204	Gottlieb 2004, p. 1931, fig. 27.10:13
Lachish	236	5b-1	62223	Gottlieb 2004, p. 1929, fig. 27.9:14
Lachish	123	5b-1	38082/60	Gottlieb 2004, p. 1917, fig. 27.3:18
Nimrud	232	5b-1	ND 9268	British Museum; drawing by Szudy

Type 5b-1 (continued)



Lachish 183 Lachish 243 Lachish 205



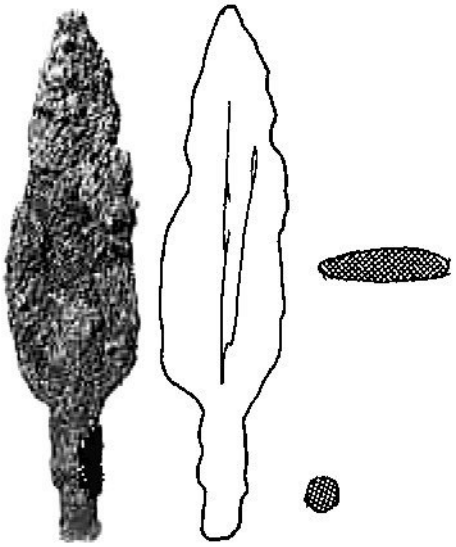
Igdyr 1 Lachish 202 Lachish 200

Sources:

Site	No.	Type	Item No.	Source
Lachish	183	5b-1	60557/60	Gottlieb 2004, p. 1925, fig. 27.7:2
Lachish	243	5b-1	60671/60	Gottlieb 2004, p. 1931, fig. 27.10:4
Lachish	205	5b-1	61912	Gottlieb 2004, p. 1927, fig. 27.8:4
Igdyr	1	5b-1	fig. 37:4	Barnett 1963, p. 186; fig. 37:4
Lachish	202	5b-1	61289/60	Gottlieb 2004, p. 1927, fig. 27.8:1
Lachish	200	5b-1	61373/60	Gottlieb 2004, p. 1925, fig. 27.7:19

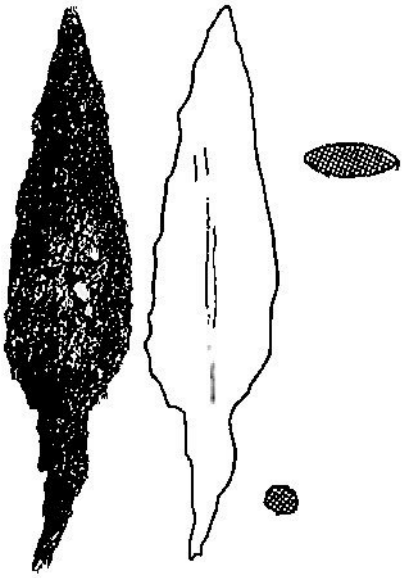
Plate 140

Type 5b-1 (continued)

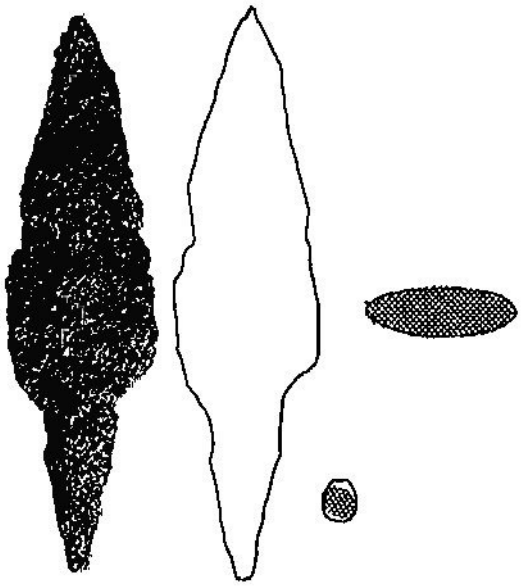


Lachish 239

Nimrud 29



Lachish 248

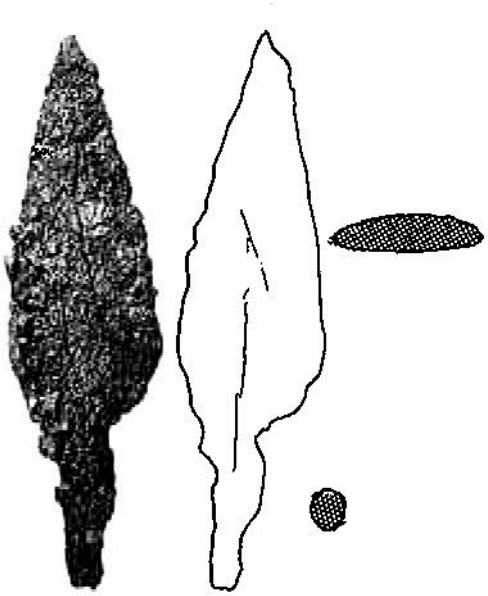


Lachish 237

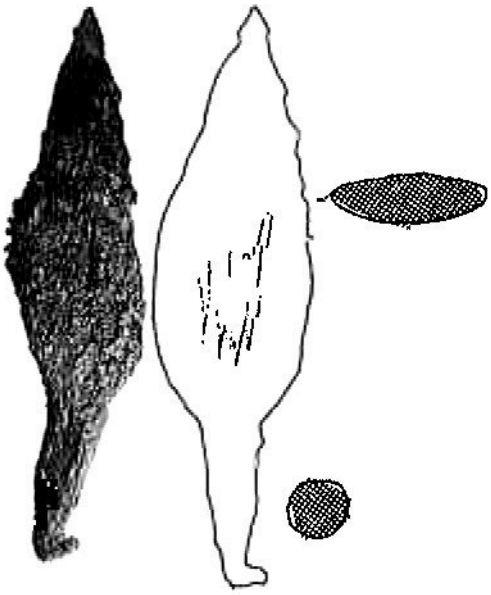
Sources:

Site	No.	Type	Item No.	Source
Lachish	239	5b-1	621576/60	Gottlieb 2004, p. 1929, fig. 27.9:18
Nimrud	29	5b-1	ND 10944	British Museum
Lachish	248	5b-1	61802/60	Gottlieb 2004, p. 1931, fig. 27.10:9
Lachish	237	5b-1	61759/60	Gottlieb 2004, p. 1929, fig. 27.9:15

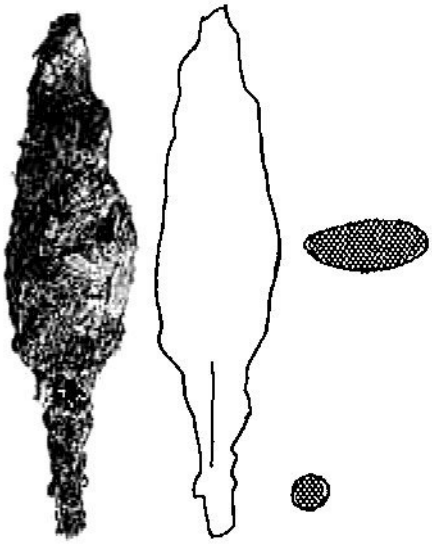
Type 5b-1 (continued)



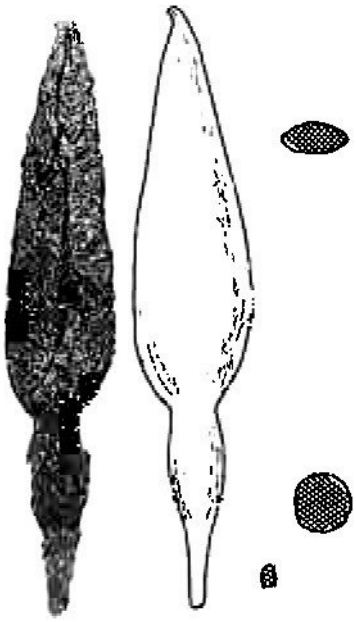
Lachish 227



Lachish 218



Lachish 359

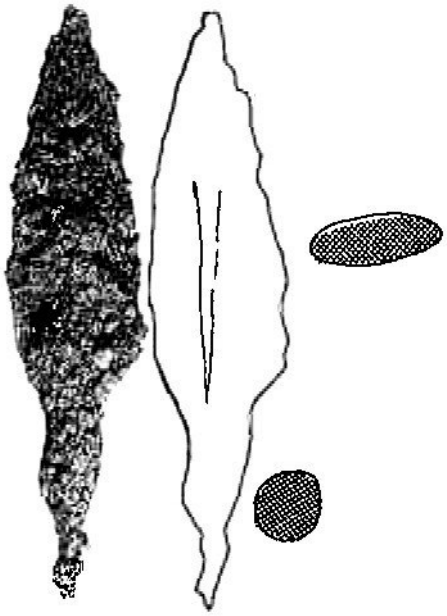


Lachish 112

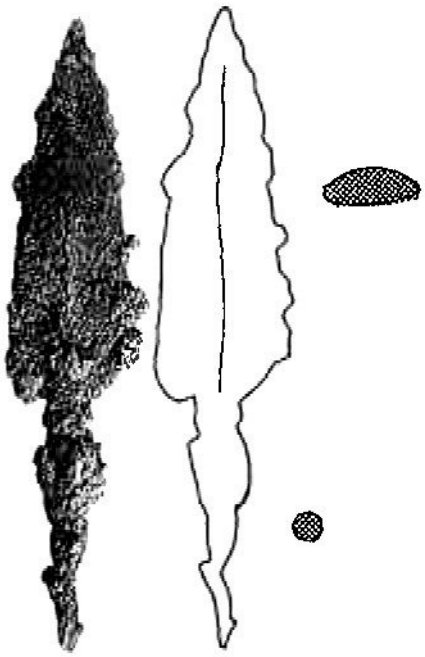
Sources:

Site	No.	Type	Item No.	Source
Lachish	227	5b-1	92023/60	Gottlieb 2004, p. 1929, fig. 27.9:5
Lachish	218	5b-1	60376/60	Gottlieb 2004, p. 1927, fig. 27.8:17
Lachish	359	5b-1	7056	Gottlieb 2004, p. 1945, fig. 27.17:13
Lachish	112	5b-1	39151/60	Gottlieb 2004, p. 1917, fig. 27.3:6

Type 5b-1 (continued)

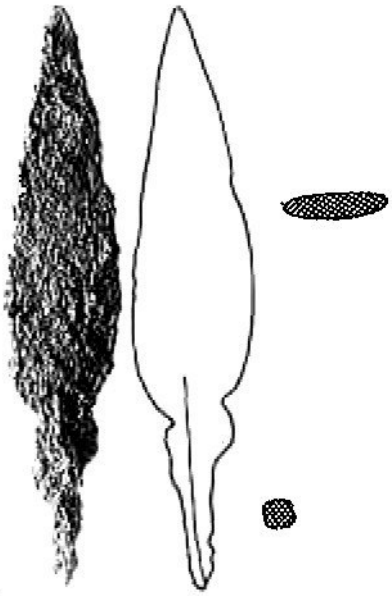


Lachish 229

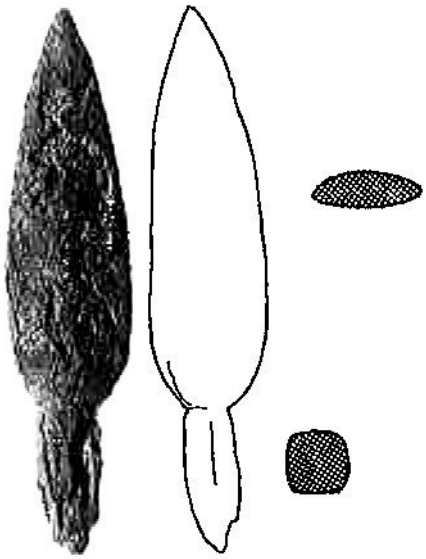


Lachish 263

Igdyr 4



Lachish 134

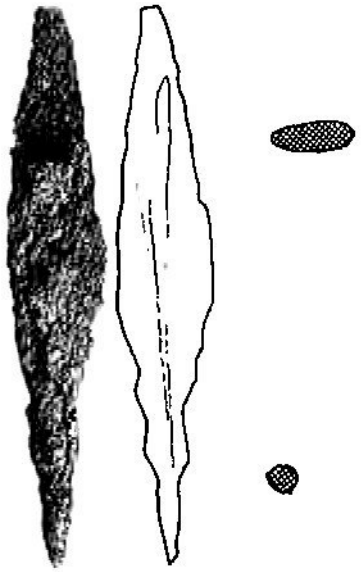


Lachish 122

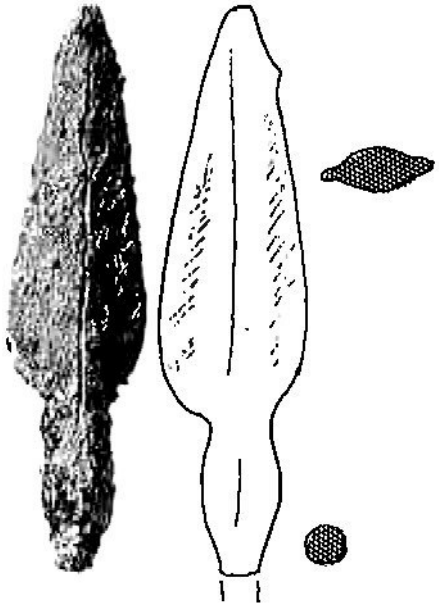
Sources:

Site	No.	Type	Item No.	Source
Lachish	229	5b-1	62155/60	Gottlieb 2004, p. 1929, fig. 27.9:7
Lachish	263	5b-1	62195/60	Gottlieb 2004, p. 1933, fig. 27.11:6
Igdyr	4	5b-1	fig. 37:7	Barnett 1963, p. 186; fig. 37:7
Lachish	134	5b-1	39438/61	Gottlieb 2004, p. 1919, fig. 27.4:11
Lachish	122	5b-1	38829/60	Gottlieb 2004, p. 1917, fig. 27.3:17

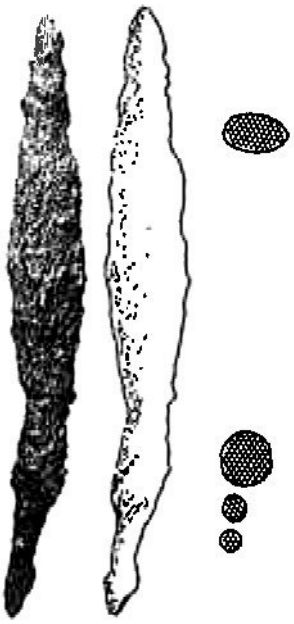
Type 5b-1 (continued)



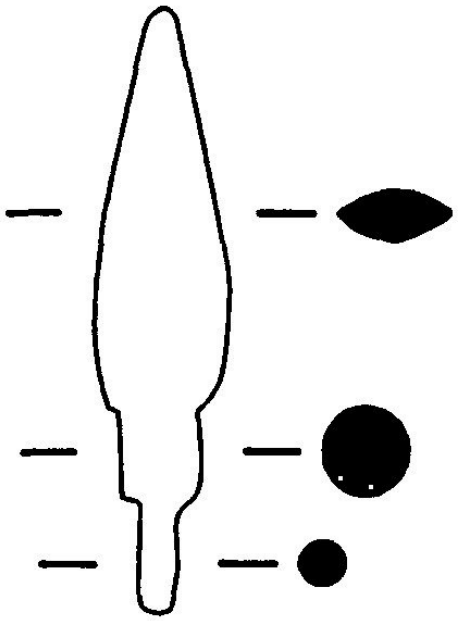
Lachish 211



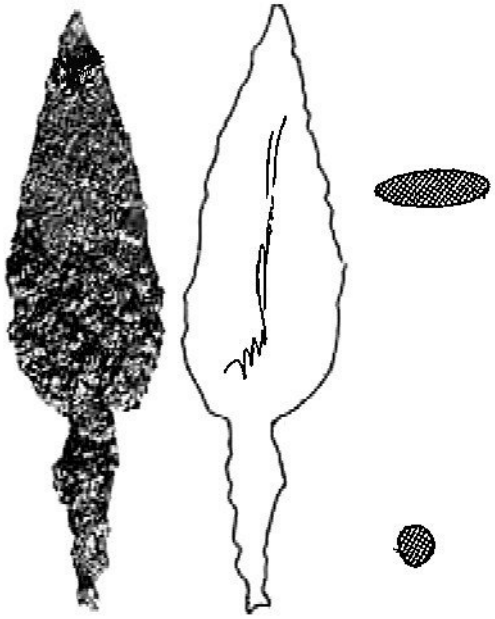
Lachish 17



Lachish 88



Hasanlu 20



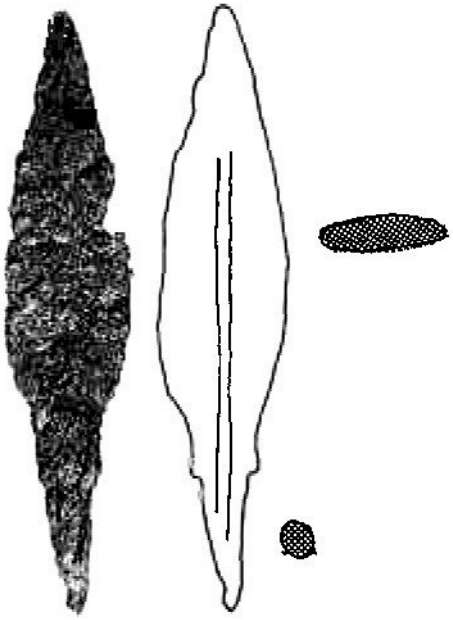
Lachish 225

Sources:

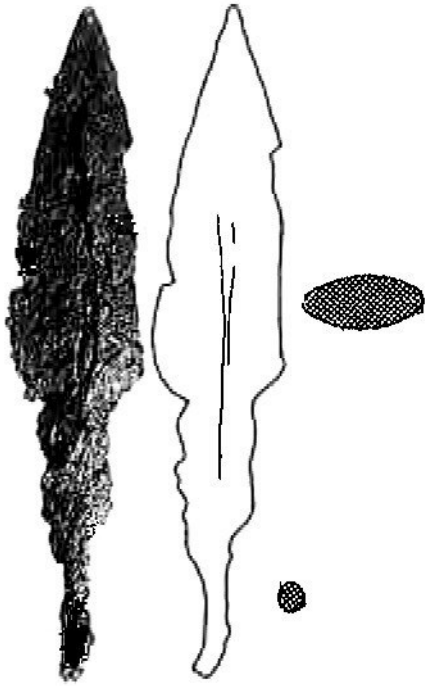
Site	No.	Type	Item No.	Source
Lachish	211	5b-1	61793/60	Gottlieb 2004, p. 1927, fig. 27.8:10
Lachish	17	5b-1	5481	Gottlieb 2004, p. 1945, fig. 27.17:11
Lachish	88	5b-1	40052/60	Gottlieb 2004, p. 1911, fig. 27.1:17
Hasanlu	20	5b-1	HAS 70-206	Thornton & Pigott 2011, p. 142, fig. 6.3:3
Lachish	225	5b-1	62090/60	Gottlieb 2004, p. 1929, fig. 27.9:3

Plate 144

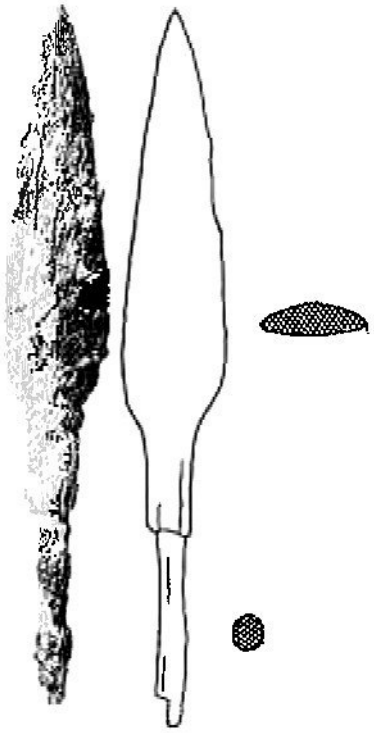
Type 5b-1 (continued)



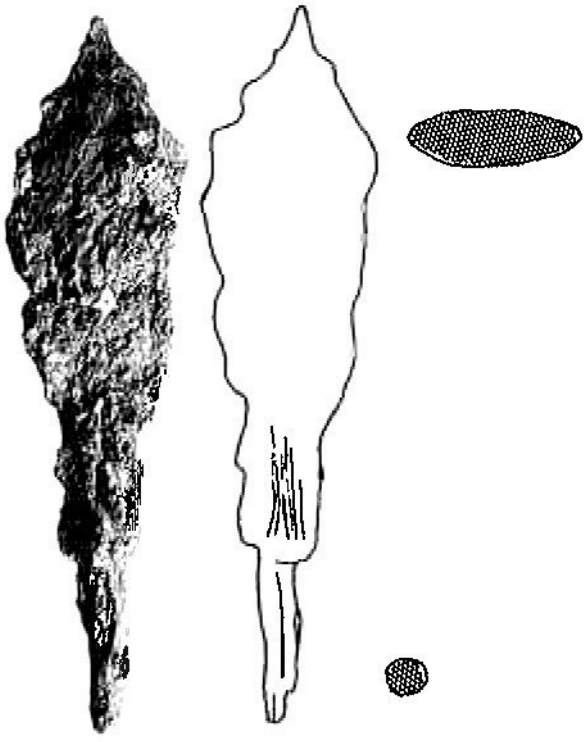
Lachish 295



Lachish 278



Lachish 44

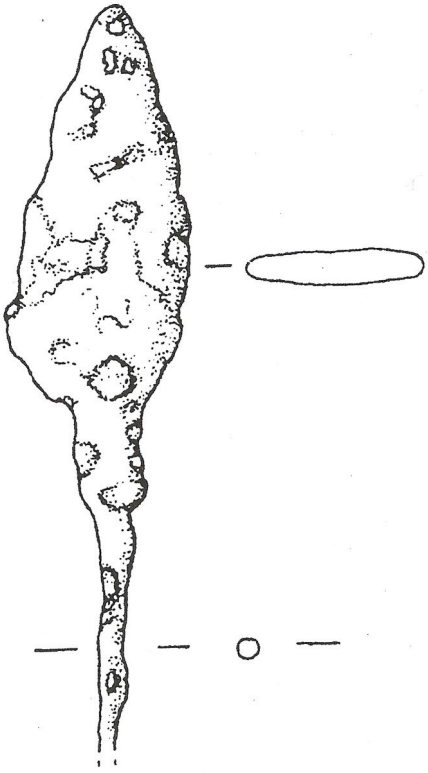


Lachish 38

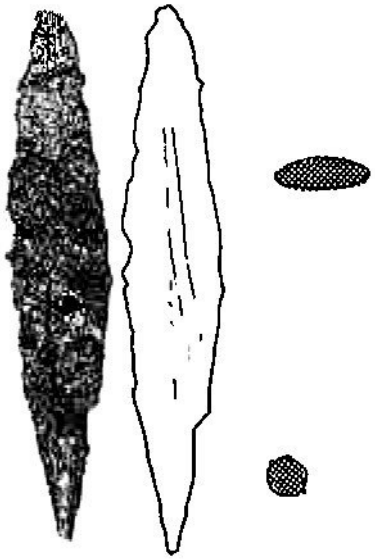
Sources:

Site	No.	Type	Item No.	Source
Lachish	295	5b-1	60410/60	Gottlieb 2004, p. 1937, fig. 27.13:1
Lachish	278	5b-1	62110/60	Gottlieb 2004, p. 1935, fig. 27.12:4
Lachish	44	5b-1	7108	Gottlieb 2004, p. 1945, fig. 27.17:8
Lachish	38	5b-1	6838	Gottlieb 2004, p. 1945, fig. 27.17:6

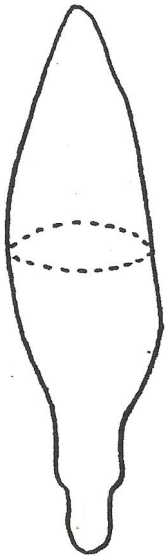
Type 5b-1 (continued)



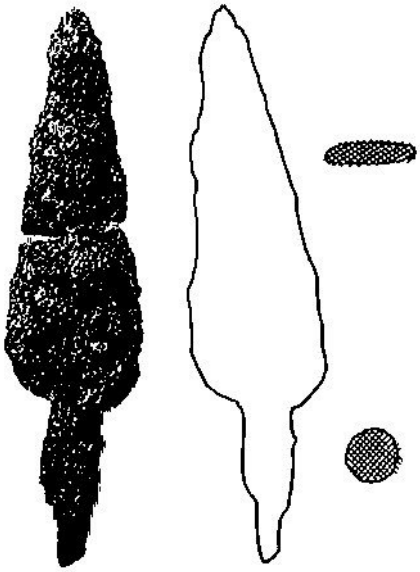
Ayanis 50



Lachish 208



Lachish 39

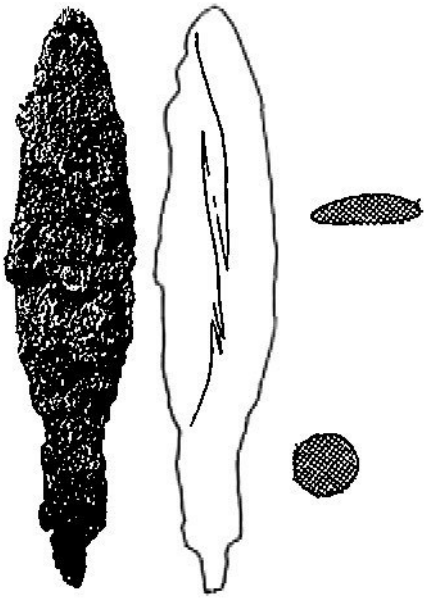


Lachish 265

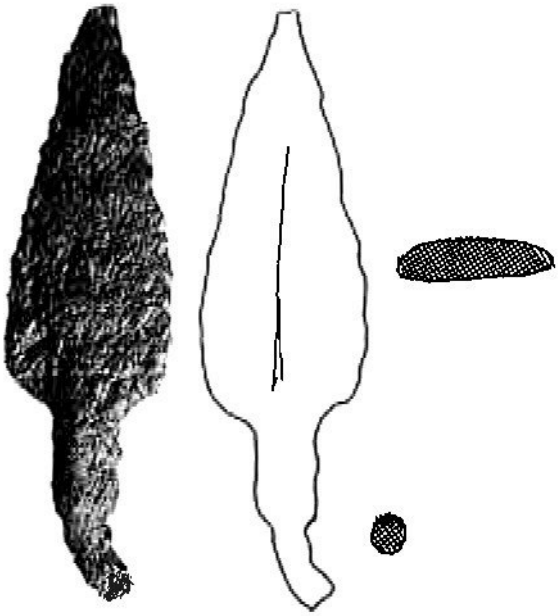
Sources:

Site	No.	Type	Item No.	Source
Ayanis	50	5b-1	50	Derın & Muscarella 2001, fig. 4
Lachish	208	5b-1	60396/60	Gottlieb 2004, p. 1927, fig. 27.8:7
Lachish	39	5b-1	6839	Tufnell et al 1953, p. 120, pl. 60:27
Lachish	265	5b-1	62189/60	Gottlieb 2004, p. 1933, fig. 27.11:8

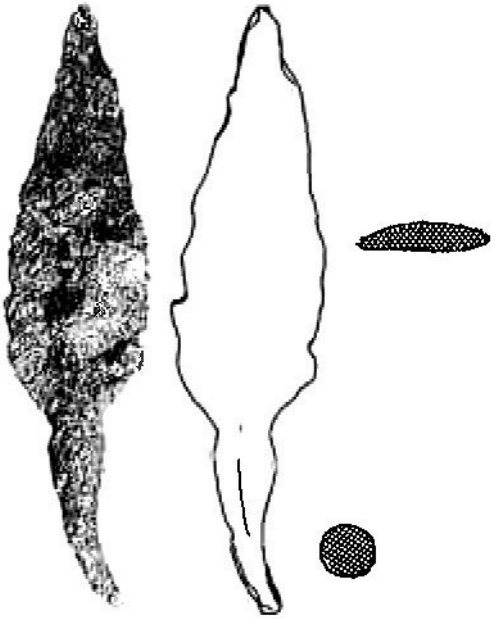
Type 5b-1 (continued)



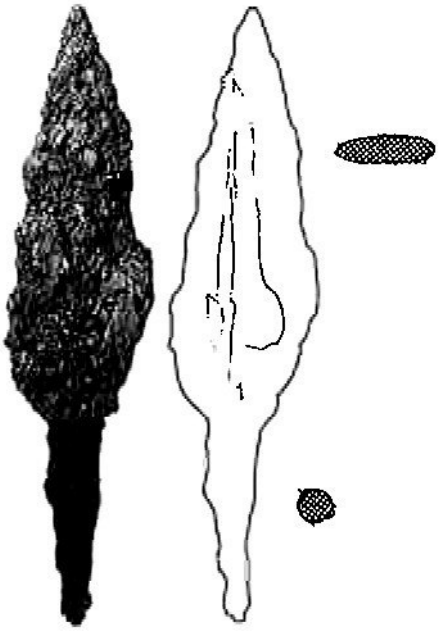
Lachish 187



Lachish 296



Lachish 258



Lachish 246

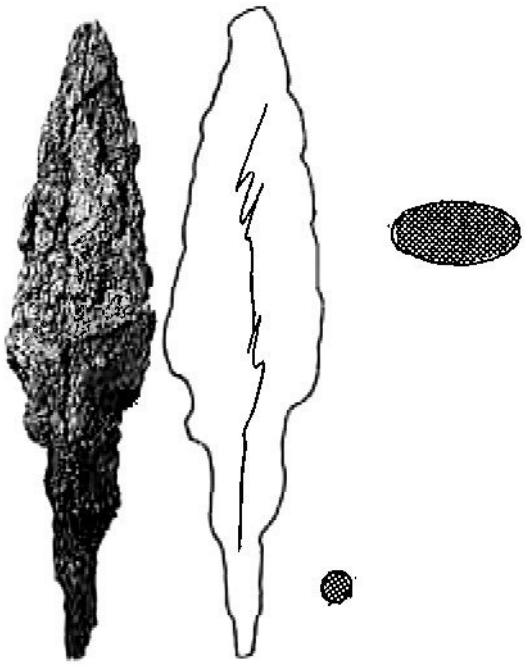
Igdyr 5

Sources:

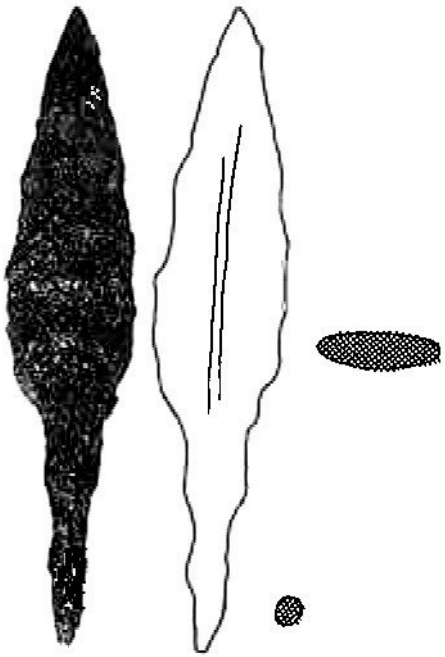
Site	No.	Type	Item No.	Source
Lachish	187	5b-1	61819/60	Gottlieb 2004, p. 1925, fig. 27.7:6
Lachish	296	5b-1	61043/60	Gottlieb 2004, p. 1937, fig. 27.13:2
Lachish	258	5b-1	60820/60	Gottlieb 2004, p. 1933, fig. 27.11:1
Lachish	246	5b-1	62046/60	Gottlieb 2004, p. 1931, fig. 27.10:7
Igdyr	5	5b-1	fig. 37:11	Barnett 1963, p. 186; fig. 37:11

Plate 147

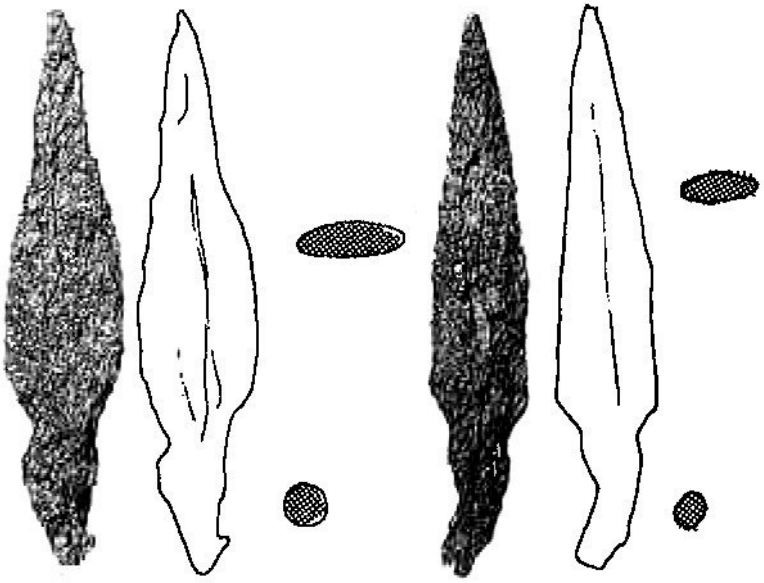
Type 5b-1 (continued)



Lachish 289

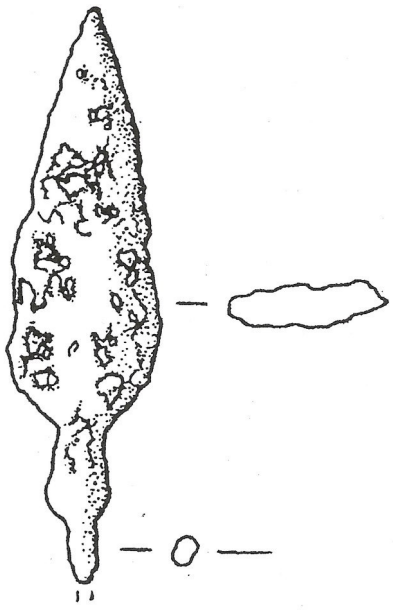


Lachish 242



Lachish 196

Lachish 214



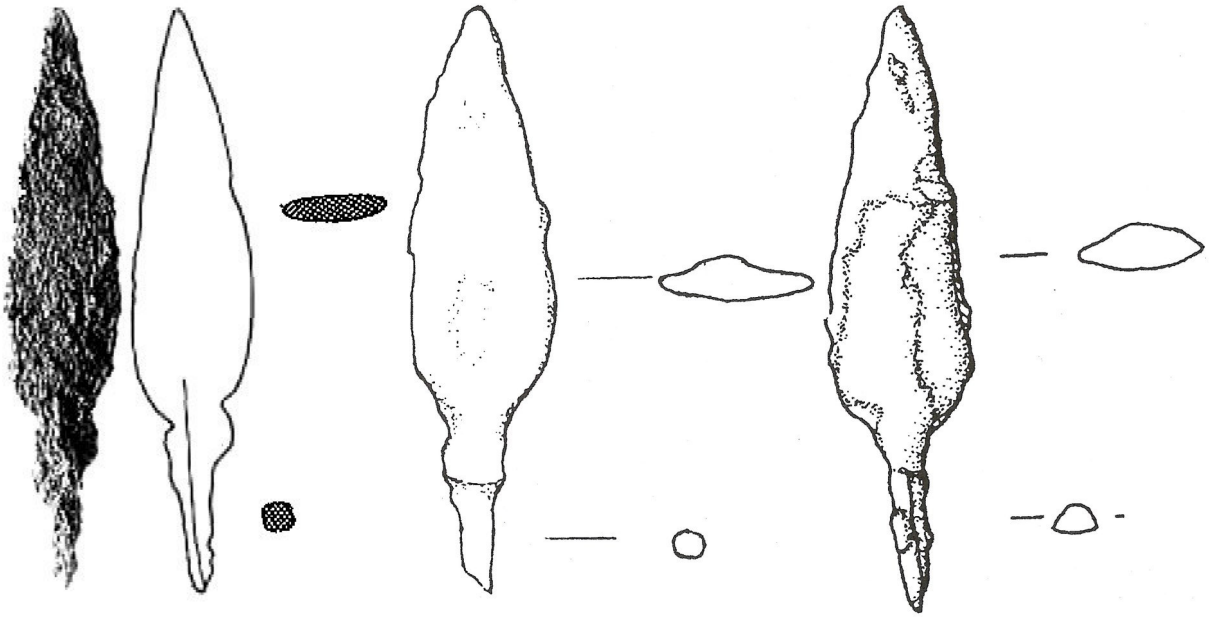
Ayanis 48

Sources:

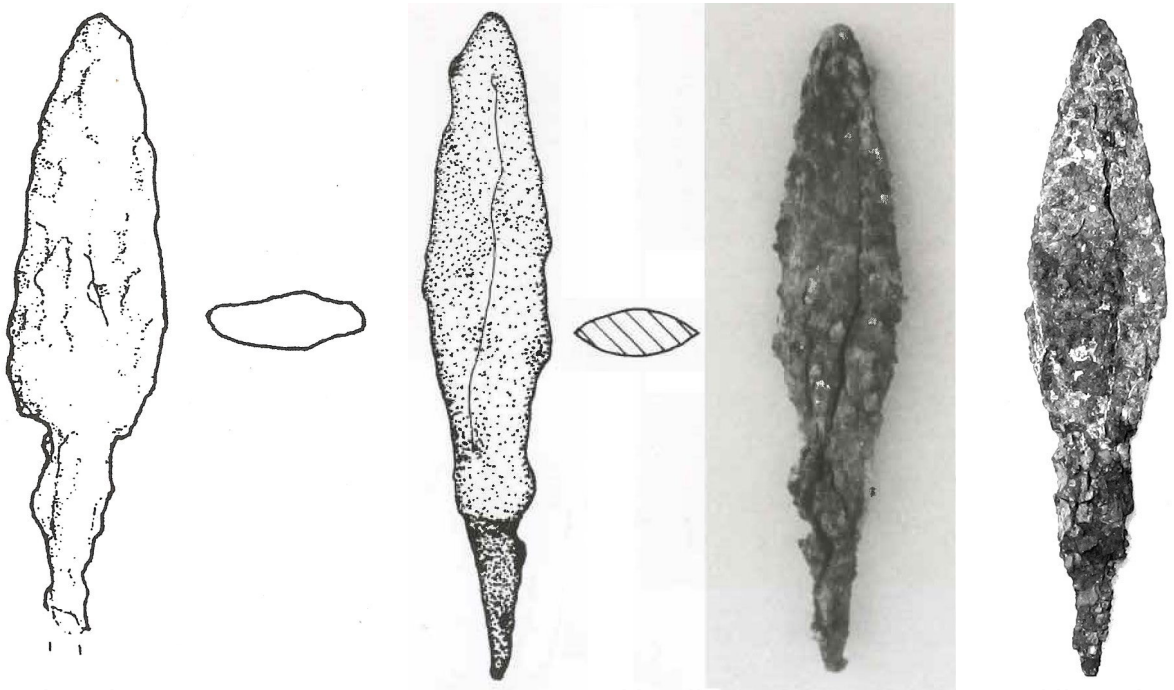
Site	No.	Type	Item No.	Source
Lachish	289	5b-1	60807/60	Gottlieb 2004, p. 1935, fig. 27.12:15
Lachish	242	5b-1	61048/60	Gottlieb 2004, p. 1931, fig. 27.10:3
Lachish	196	5b-1	60782/60	Gottlieb 2004, p. 1925, fig. 27.7:15
Lachish	214	5b-1	60802/60	Gottlieb 2004, p. 1927, fig. 27.8:13
Ayanis	48	5b-1	48	Derın & Muscarella 2001, fig. 4

Plate 148

Type 5b-1 (continued)



Lachish 133 Ayanis 57 Ayanis 47

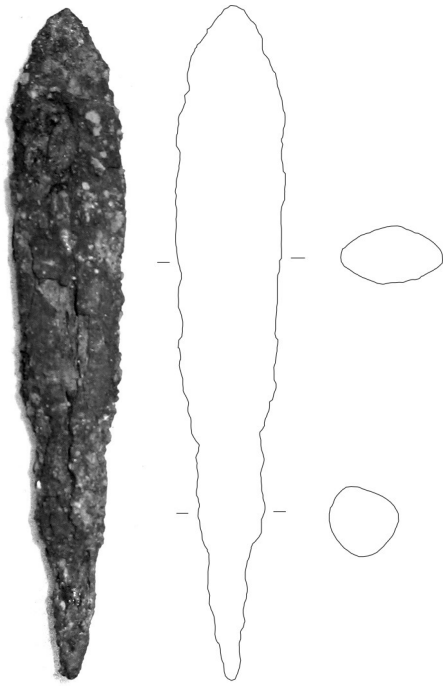


Ayanis 58 Knedig 14 Nimrud 4

Sources:

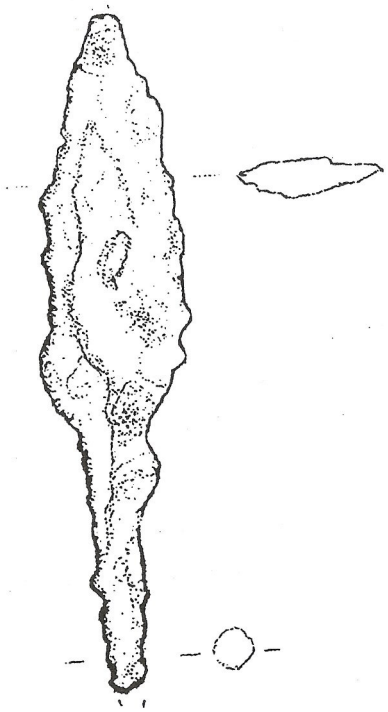
Site	No.	Type	Item No.	Source
Lachish	133	5b-1	10327/60	Gottlieb 2004, p. 1919, fig. 27.4:10
Ayanis	57	5b-1	57	Derın & Muscarella 2001, fig. 5
Ayanis	47	5b-1	47	Derın & Muscarella 2001, fig. 4
Ayanis	58	5b-1	58	Derın & Muscarella 2001, fig. 5
Tell Knedig	14	5b-1	1124	Klengel-Brandt et al 2005, p. 306, pl. 202
Nimrud	4	5b-1	ND 9268	British Museum

Type 5b-1 (continued)

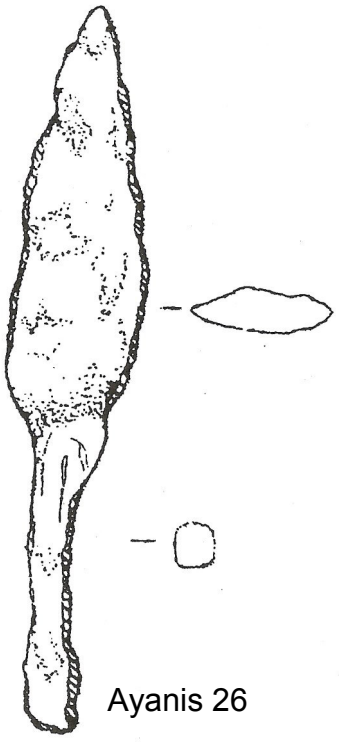


Nimrud 251

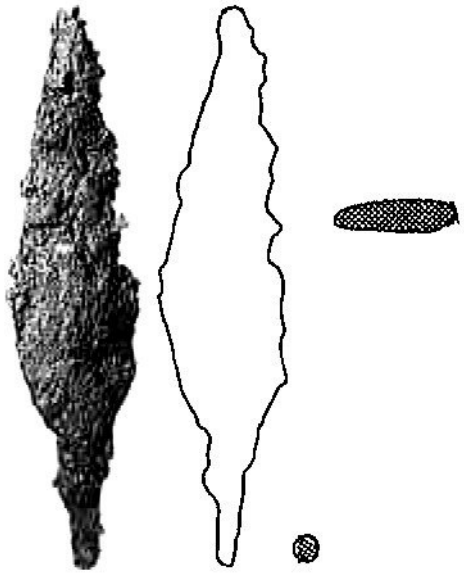
Nimrud 14



Ayanis 31



Ayanis 26

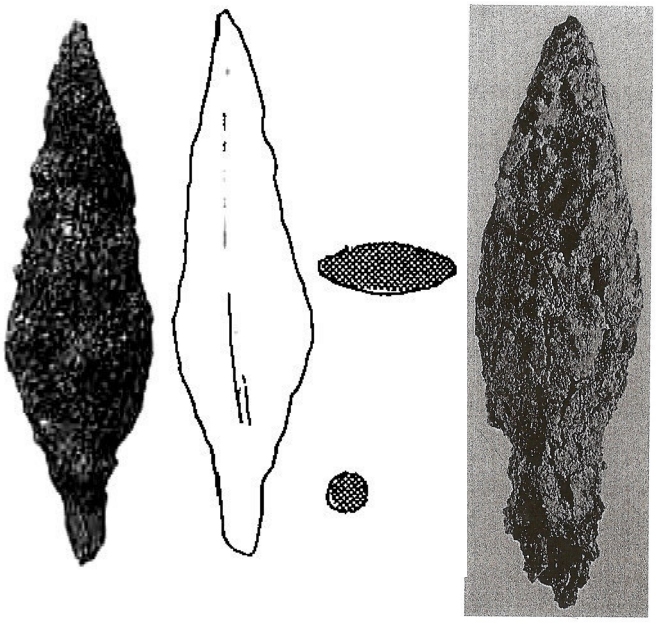


Lachish 222

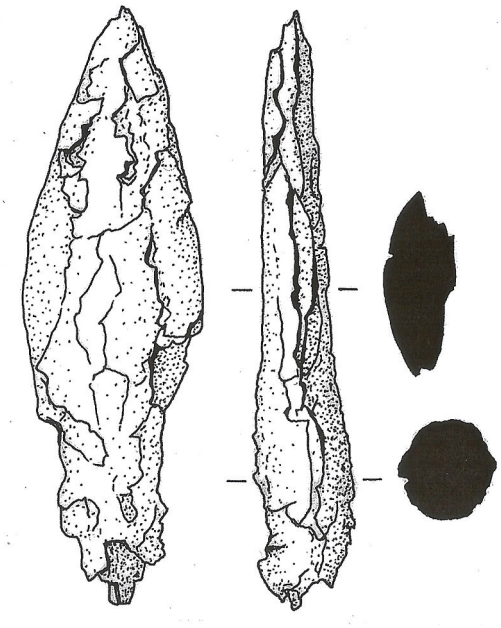
Sources:

Site	No.	Type	Item No.	Source
Nimrud	251	5b-1	ND 8102	British Museum
Nimrud	14	5b-1	ND 10944	British Museum
Ayanis	31	5b-1	31	Derın & Muscarella 2001, fig. 3
Ayanis	26	5b-1	26	Derın & Muscarella 2001, fig. 3
Lachish	222	5b-1	61991/60	Gottlieb 2004, p. 1927, fig. 27.8:21

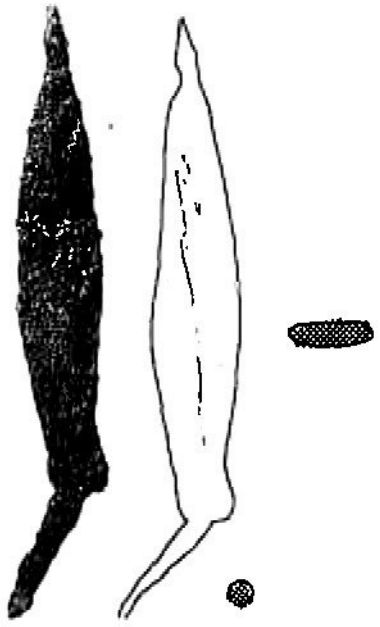
Type 5b-1 (continued)



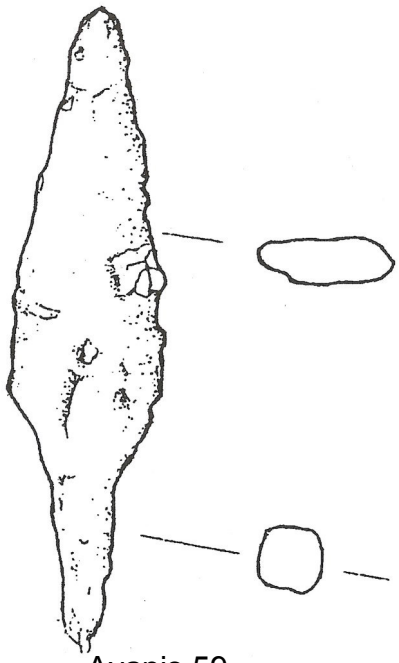
Lachish 220



Uruk 29



Lachish 172

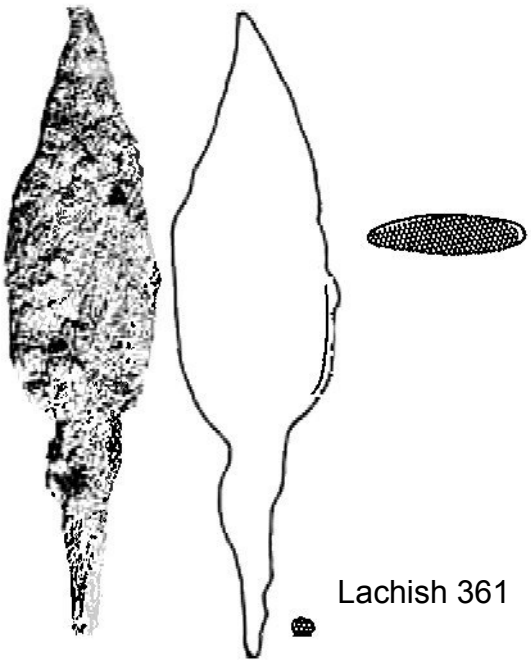


Ayanis 59

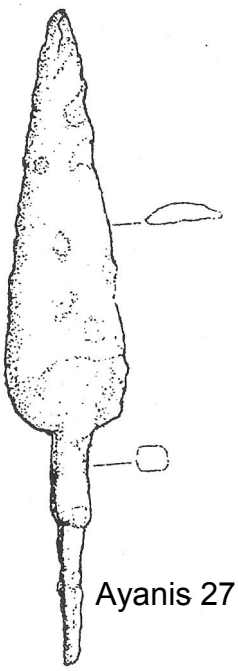
Sources:

Site	No.	Type	Item No.	Source
Lachish	220	5b-1	62207/60	Gottlieb 2004, p. 1927, fig. 27.8:19
Uruk	29	5b-1	W 1623	Pedde 2000, p. 73, no. 1259
Lachish	172	5b-1	62015/60	Gottlieb 2004, p. 1923, fig. 27.6:11
Ayanis	59	5b-1	59	Derın & Muscarella 2001, fig. 5

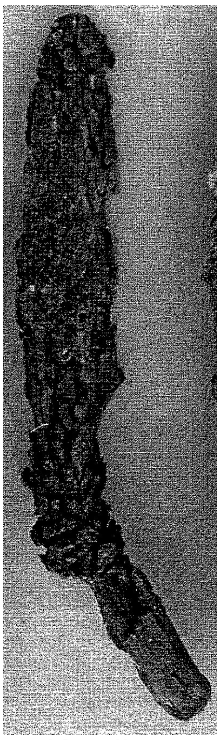
Type 5b-1 (continued)



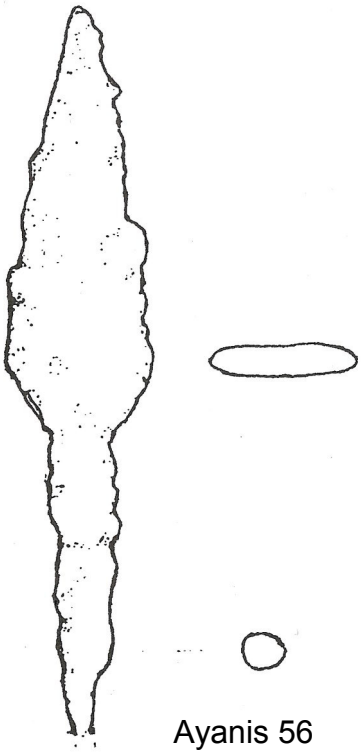
Lachish 361



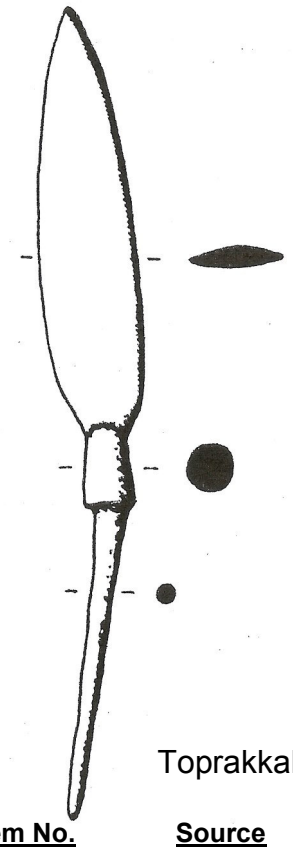
Ayanis 27



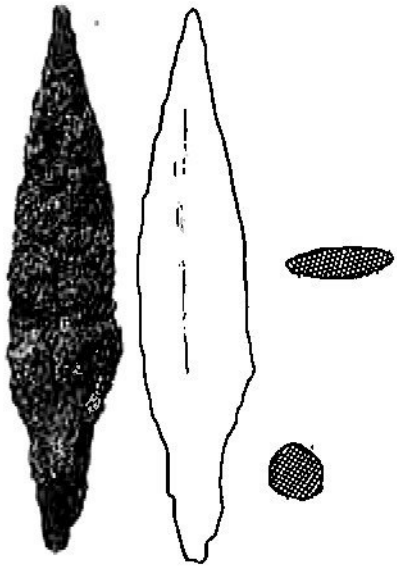
Knedig 4



Ayanis 56



Toprakkale 7

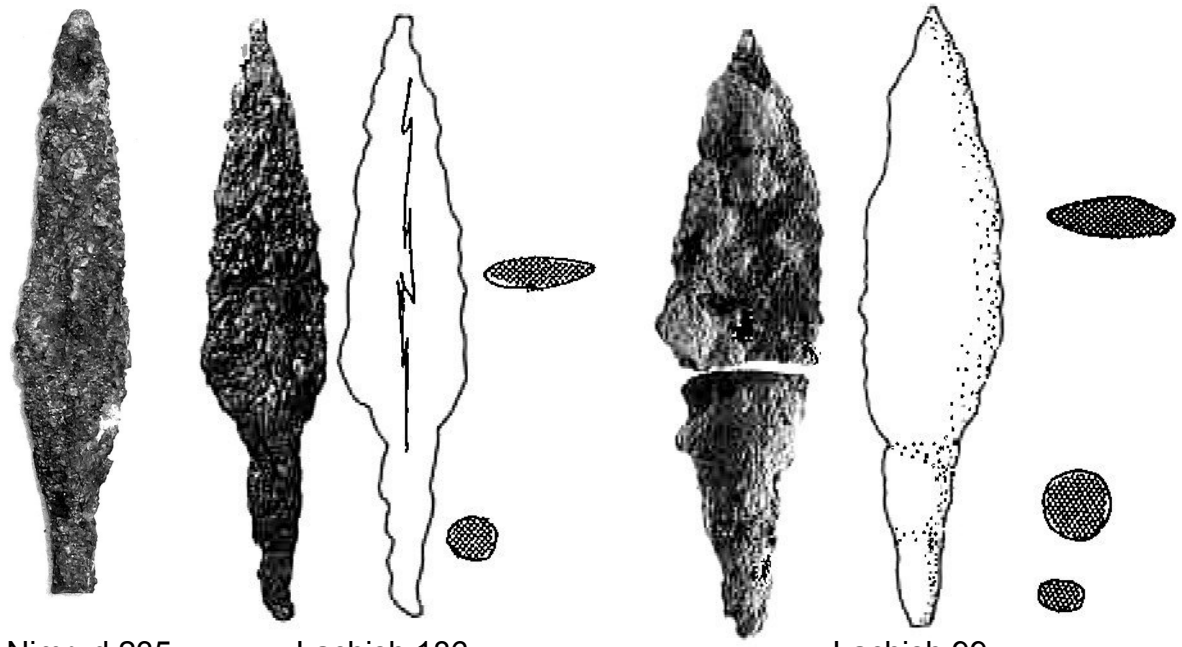


Lachish 213

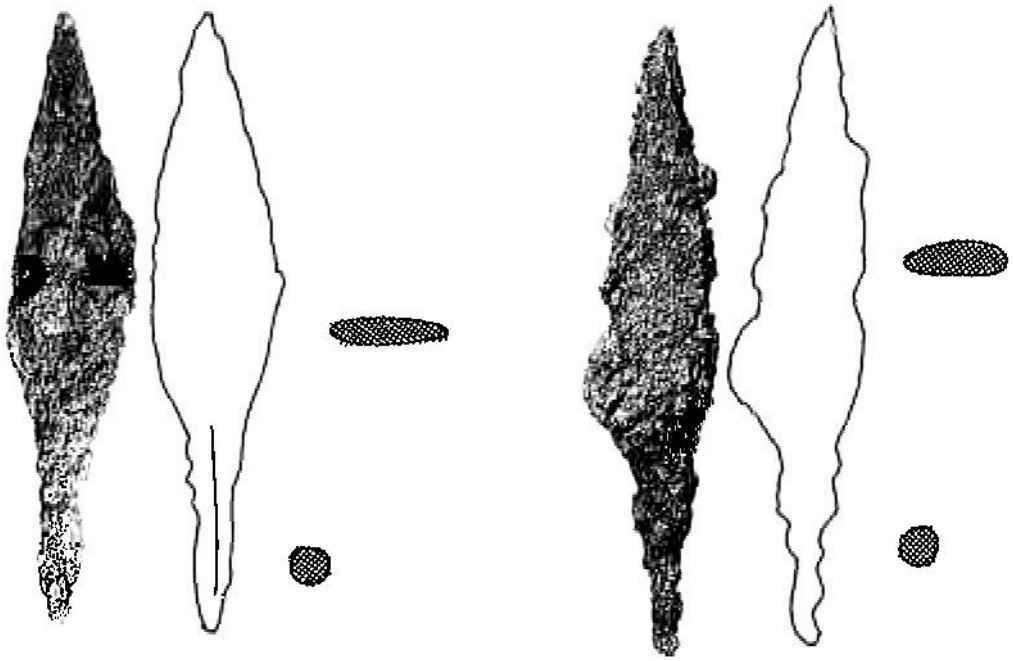
Sources:

Site	No.	Type	Item No.	Source
Lachish	361	5b-1		Gottlieb 2004, p. 1947, fig. 27.18:3
Ayanis	27	5b-1	27	Derın & Muscarella 2001, fig. 3
Tell Knedig	4	5b-1	1119b	Klengel-Brandt et al 2005, p. 306, pl. 201
Ayanis	56	5b-1	56	Derın & Muscarella 2001, fig. 4
Toprakkale	7	5b-1	303	Wartke 1990, p. 127, fig. 32c
Lachish	213	5b-1	61062/60	Gottlieb 2004, p. 1927, fig. 27.8:12

Type 5b-1 (continued)



Nimrud 235 Lachish 186 Lachish 99



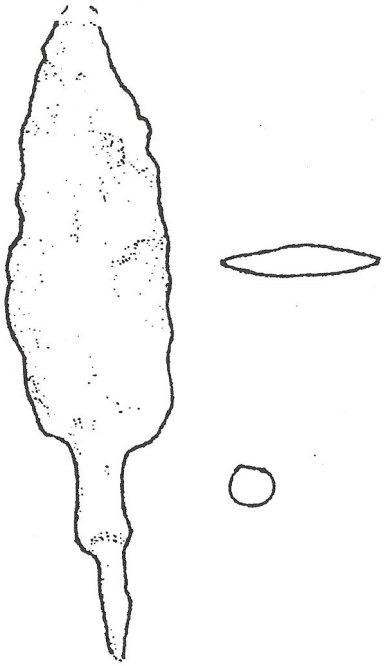
Lachish 182 Lachish 148

Sources:

Site	No.	Type	Item No.	Source
Nimrud	235	5b-1	ND 10944	British Museum
Lachish	186	5b-1	61101/60	Gottlieb 2004, p. 1925, fig. 27.7:5
Lachish	99	5b-1	8226/60	Gottlieb 2004, p. 1915, fig. 27.2:9
Lachish	182	5b-1	60592/60	Gottlieb 2004, p. 1925, fig. 27.7:1
Lachish	148	5b-1	60734/60	Gottlieb 2004, p. 1921, fig. 27.5:6

Plate 153

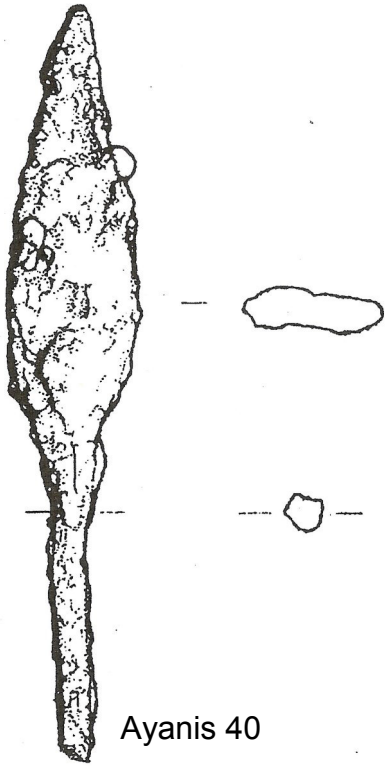
Type 5b-1 (continued)



Ayanis 61

Knedig 8

Nippur 5

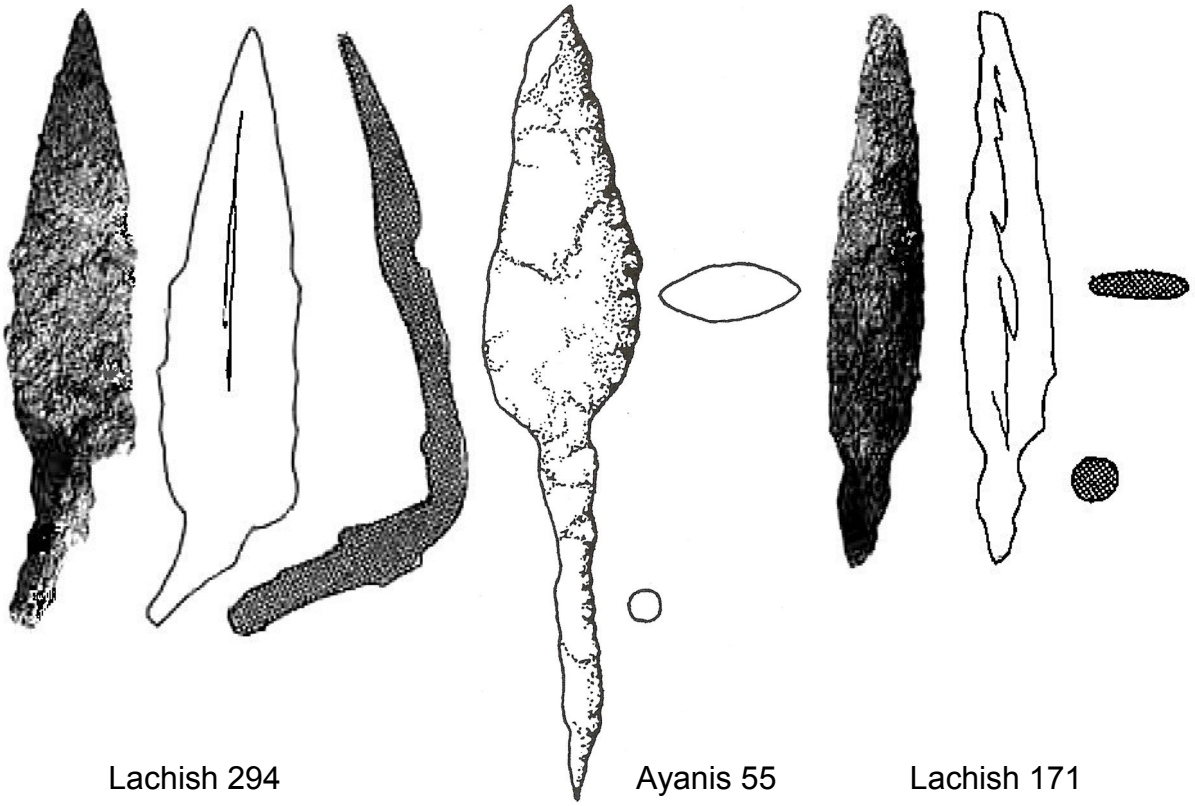


Ayanis 40

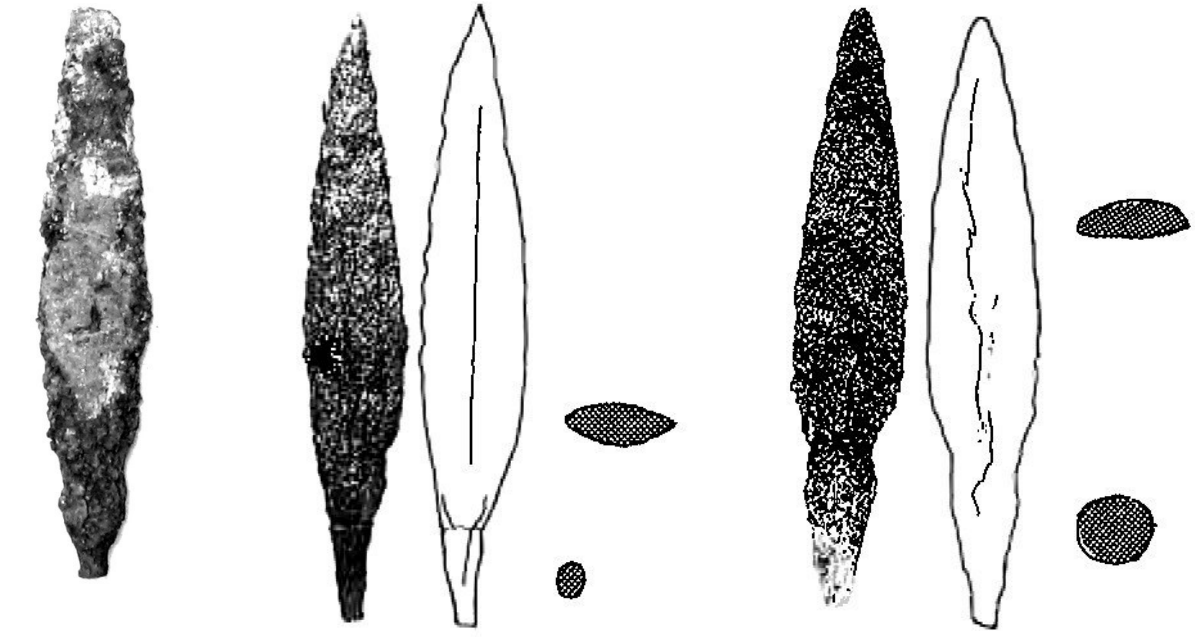
Sources:

Site	No.	Type	Item No.	Source
Ayanis	61	5b-1	61	Derın & Muscarella 2001, fig. 5
Tell Knedig	8	5b-1	1119f	Klengel-Brandt et al 2005, p. 306, pl. 201
Nippur	5	5b-1	4N 150	McCown 1978, p. 66, pl. 60:8
Ayanis	40	5b-1	40	Derın & Muscarella 2001, fig. 4

Type 5b-1 (continued)



Lachish 294 Ayanis 55 Lachish 171

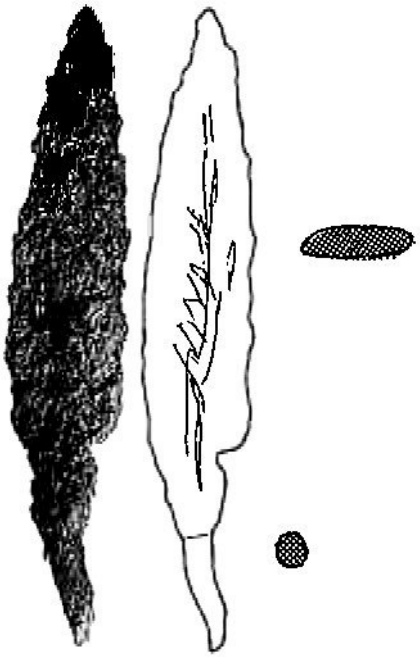


Nimrud 32 Lachish 90 Lachish 167

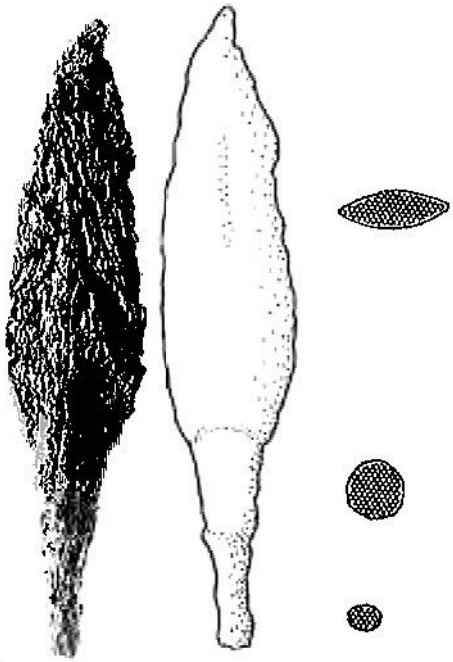
Sources:

Site	No.	Type	Item No.	Source
Lachish	294	5b-1	61967/60	Gottlieb 2004, p. 1935, fig. 27.12:20
Ayanis	55	5b-1	55	Derın & Muscarella 2001, fig. 4
Lachish	171	5b-1	61900/60	Gottlieb 2004, p. 1923, fig. 27.6:10
Nimrud	32	5b-1	ND 10944	British Museum
Lachish	90	5b-1	8969/60	Gottlieb 2004, p. 1911, fig. 27.1:19
Lachish	167	5b-1	61800/60	Gottlieb 2004, p. 1923, fig. 27.6:6

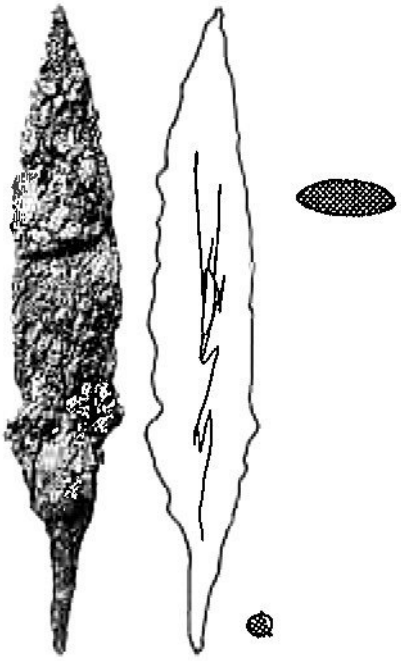
Type 5b-1 (continued)



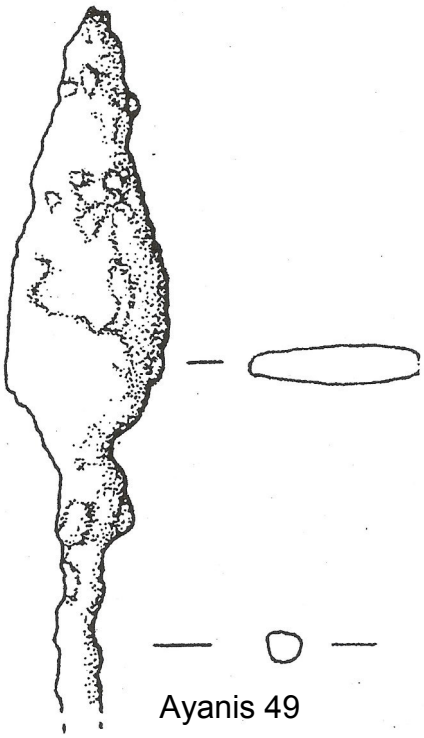
Lachish 154



Lachish 113



Lachish 161

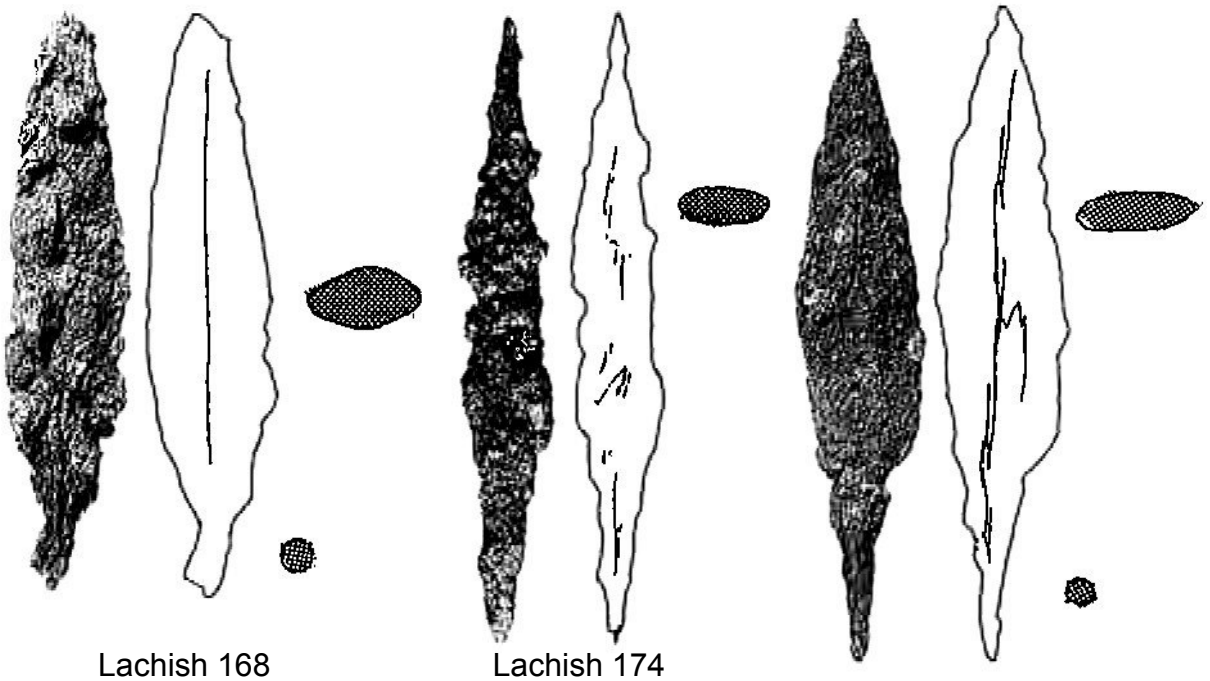


Ayanis 49

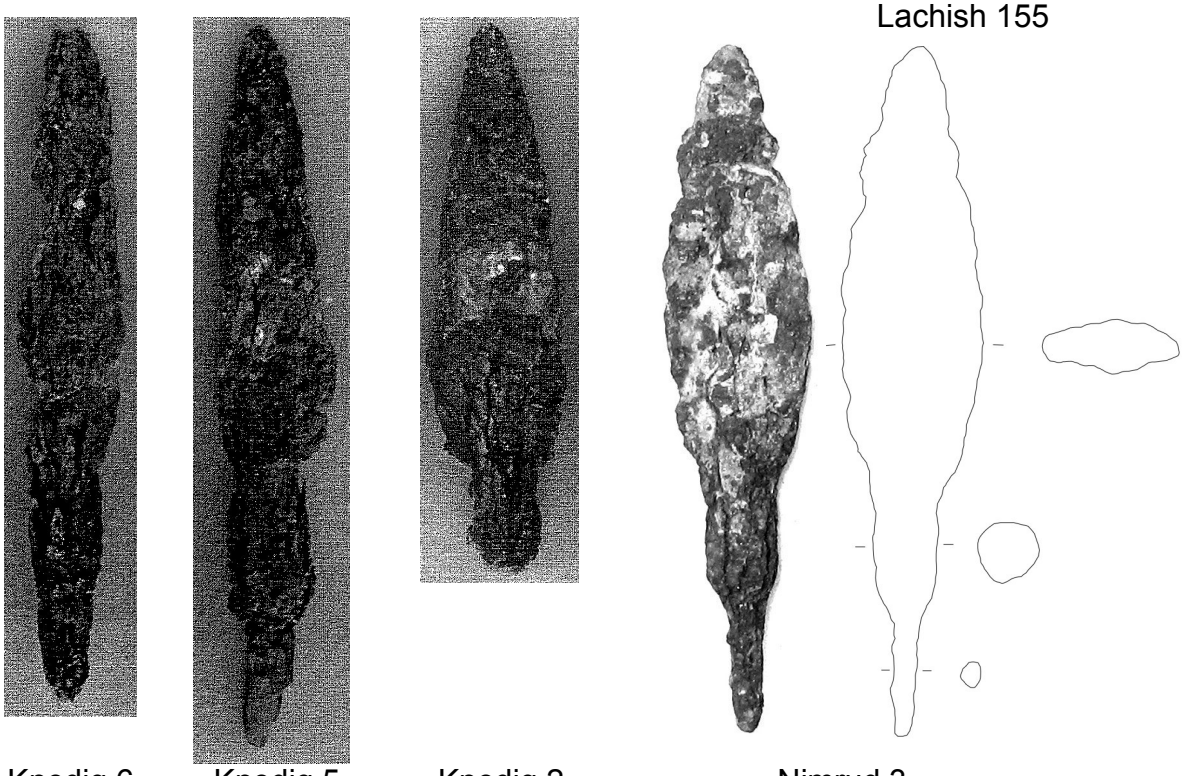
Sources:

Site	No.	Type	Item No.	Source
Lachish	154	5b-1	62236/60	Gottlieb 2004, p. 1921, fig. 27.5:12
Lachish	113	5b-1	31287/60	Gottlieb 2004, p. 1917, fig. 27.3:7
Lachish	161	5b-1	61825/60	Gottlieb 2004, p. 1921, fig. 27.5:20
Ayanis	49	5b-1	49	Derın & Muscarella 2001, fig. 4

Type 5b-1 (continued)



Lachish 168 Lachish 174 Lachish 155

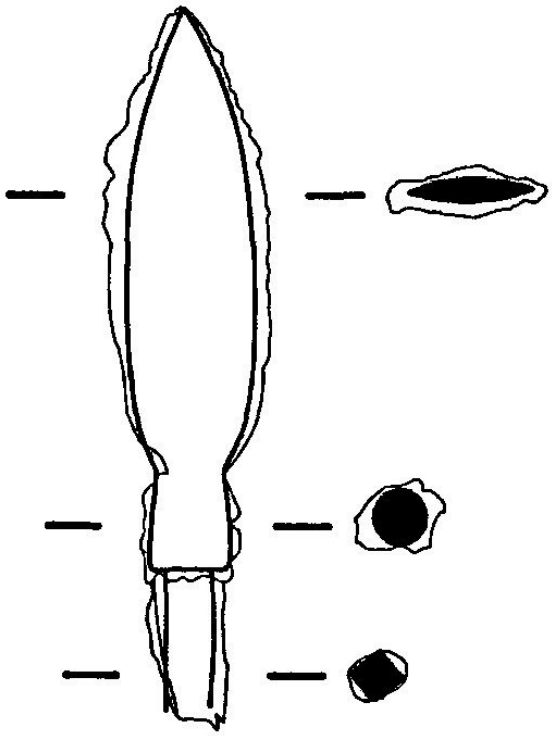


Knedig 6 Knedig 5 Knedig 2 Nimrud 3

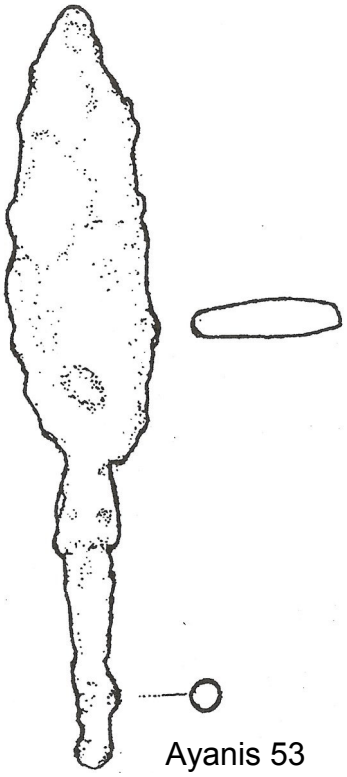
Sources:

Site	No.	Type	Item No.	Source
Lachish	168	5b-1	60763/60	Gottlieb 2004, p. 1923, fig. 27.6:7
Lachish	174	5b-1	62022/60	Gottlieb 2004, p. 1923, fig. 27.6:13
Lachish	155	5b-1	62194/60	Gottlieb 2004, p. 1921, fig. 27.5:13
Tell Knedig	6	5b-1	1119d	Klengel-Brandt et al 2005, p. 306, pl. 201
Tell Knedig	5	5b-1	1119c	Klengel-Brandt et al 2005, p. 306, pl. 201
Tell Knedig	2	5b-1	1118	Klengel-Brandt et al 2005, p. 306, pl. 201
Nimrud	3	5b-1	ND 9268	British Museum

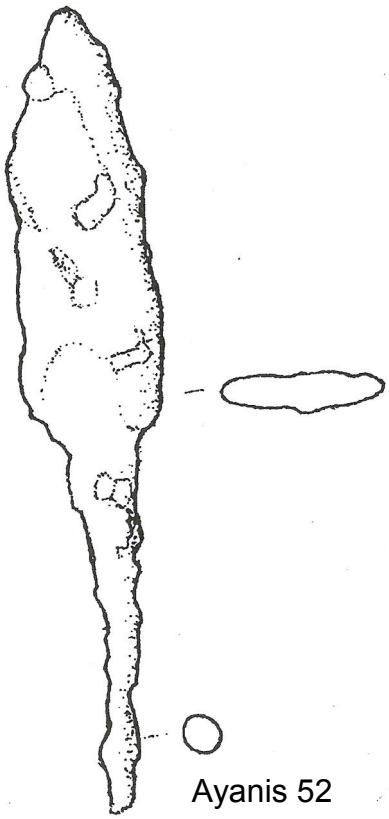
Type 5b-1 (continued)



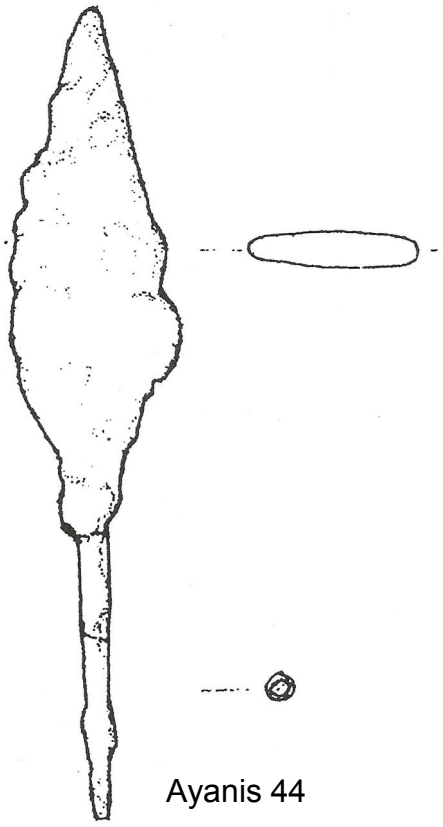
Hasanlu 19



Ayanis 53



Ayanis 52



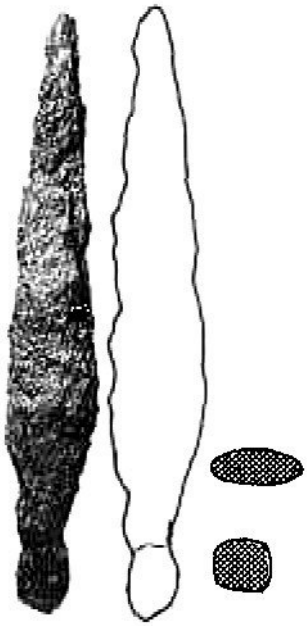
Ayanis 44

Sources:

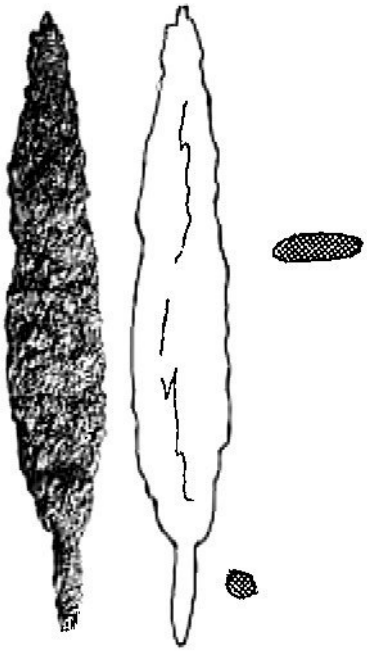
Site	No.	Type	Item No.	Source
Hasanlu	19	5b-1	HAS 62-1086 a	Thornton & Pigott 2011, p. 142, fig. 6.3:2
Ayanis	53	5b-1	53	Derın & Muscarella 2001, fig. 4
Ayanis	52	5b-1	52	Derın & Muscarella 2001, fig. 4
Ayanis	44	5b-1	44	Derın & Muscarella 2001, fig. 4

Plate 158

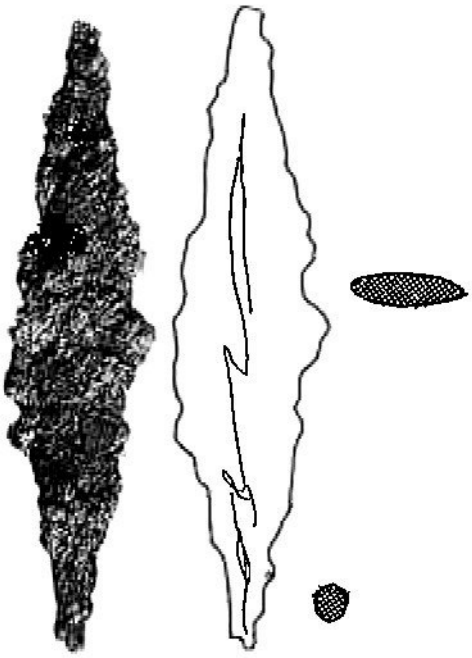
Type 5b-1 (continued)



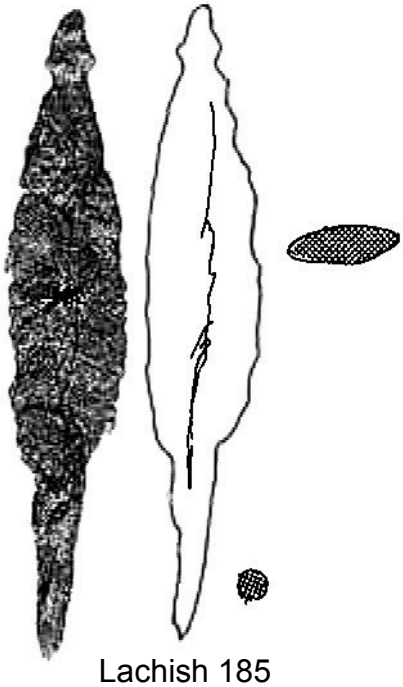
Lachish 108



Lachish 157

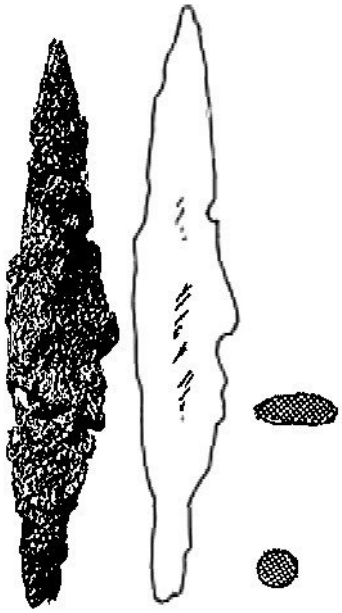


Lachish 144



Lachish 185

Knedig 1

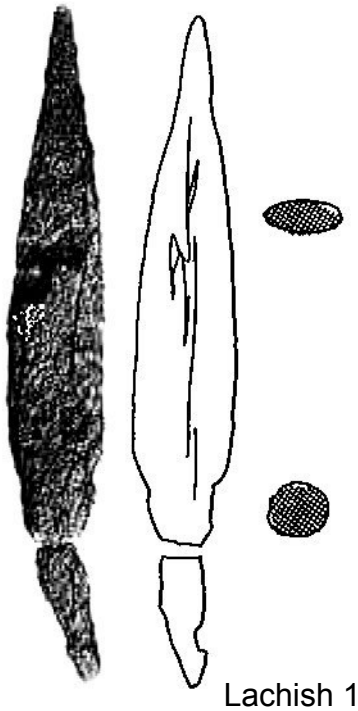


Lachish 169

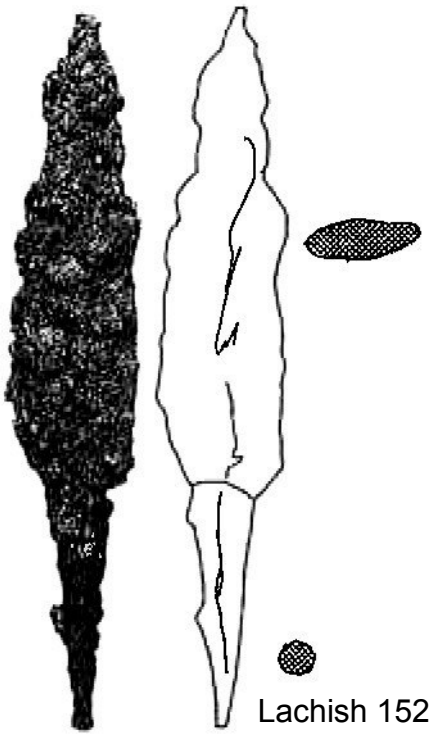
Sources:

Site	No.	Type	Item No.	Source
Lachish	108	5b-1	8810/60	Gottlieb 2004, p. 1917, fig. 27.3:2
Lachish	157	5b-1	62251	Gottlieb 2004, p. 1921, fig. 27.5:16
Lachish	144	5b-1	61827/60	Gottlieb 2004, p. 1921, fig. 27.5:2
Lachish	185	5b-1	60409/60	Gottlieb 2004, p. 1925, fig. 27.7:4
Tell Knedig	1	5b-1	1117	Klengel-Brandt et al 2005, p. 305; pl. 201
Lachish	169	5b-1	62185	Gottlieb 2004, p. 1923, fig. 27.6:8

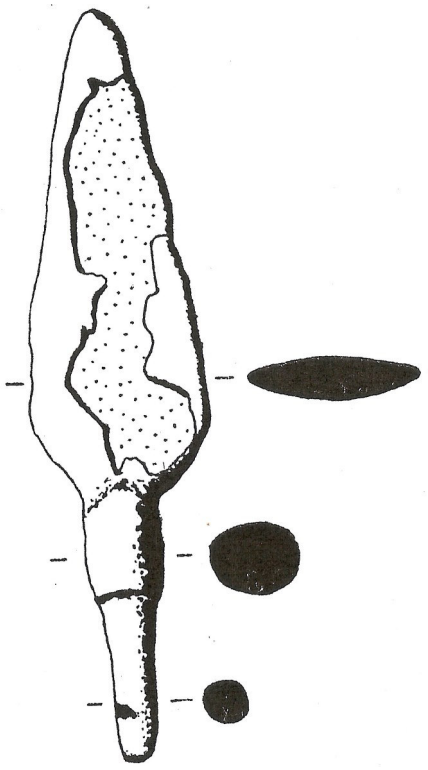
Type 5b-1 (continued)



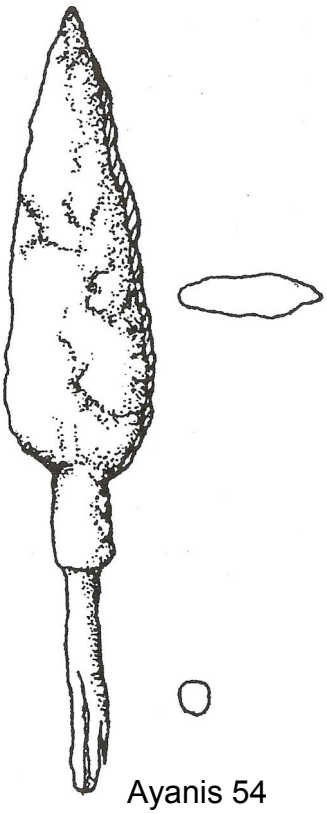
Lachish 158



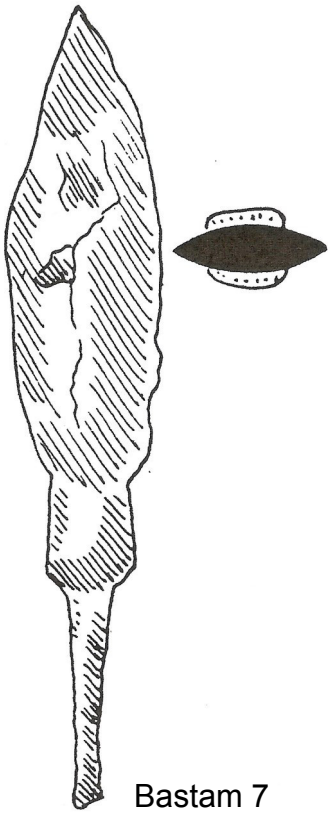
Lachish 152



Toprakkale 11



Ayanis 54



Bastam 7

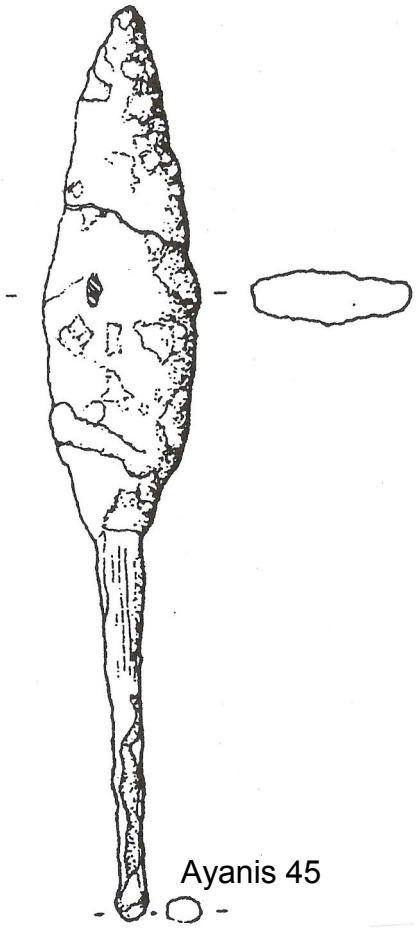
Sources:

Site	No.	Type	Item No.	Source
Lachish	158	5b-1	60765/60	Gottlieb 2004, p. 1921, fig. 27.5:17
Lachish	152	5b-1	61961/60	Gottlieb 2004, p. 1921, fig. 27.5:10
Toprakkale	11	5b-1	326	Wartke 1990, p. 127, fig. 32f; pl. 39:b.3
Ayanis	54	5b-1	54	Derın & Muscarella 2001, fig. 4
Bastam	7	5b-1	74/24	Kroll 1979, p. 160; Abb 11:6

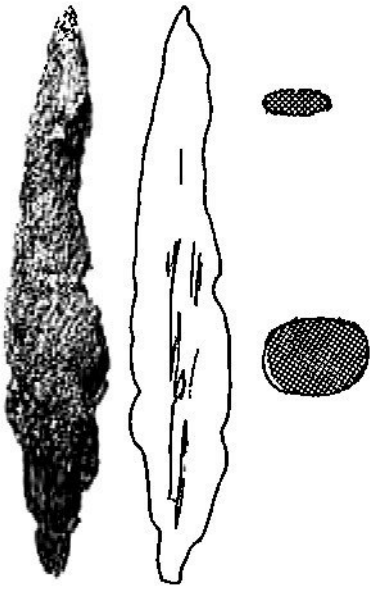
Plate 160

Type 5b-1 (continued)

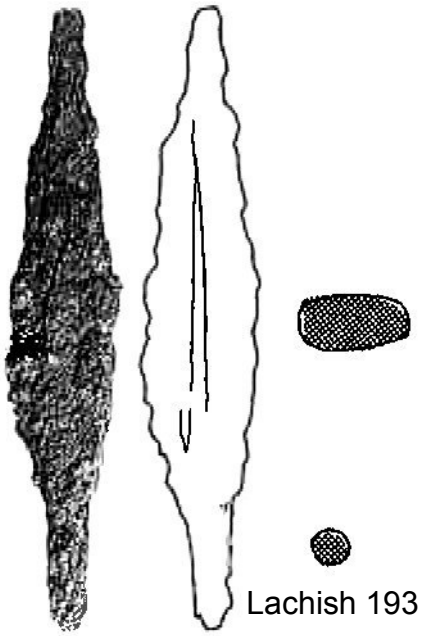
Knedig 9



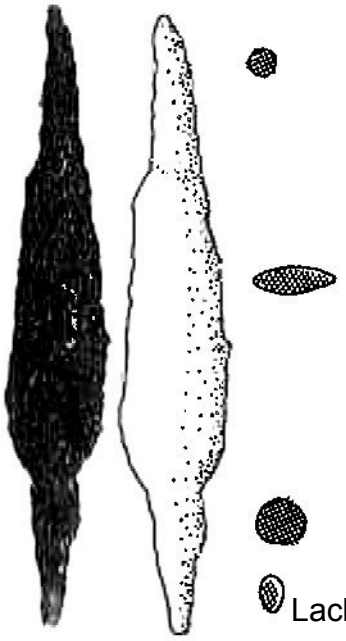
Ayanis 45



Lachish 170



Lachish 193

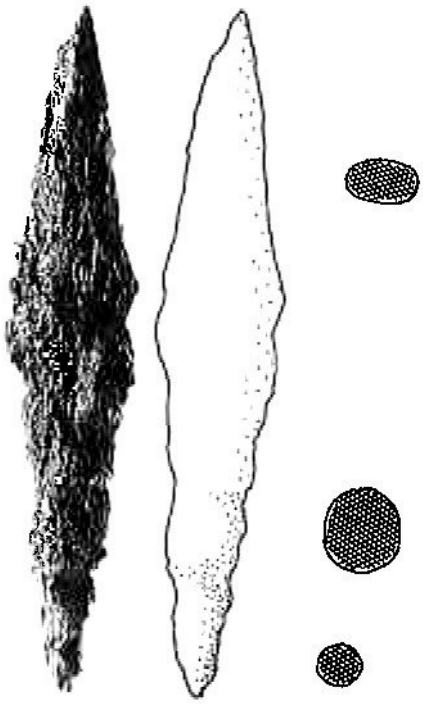


Lachish 89

Sources:

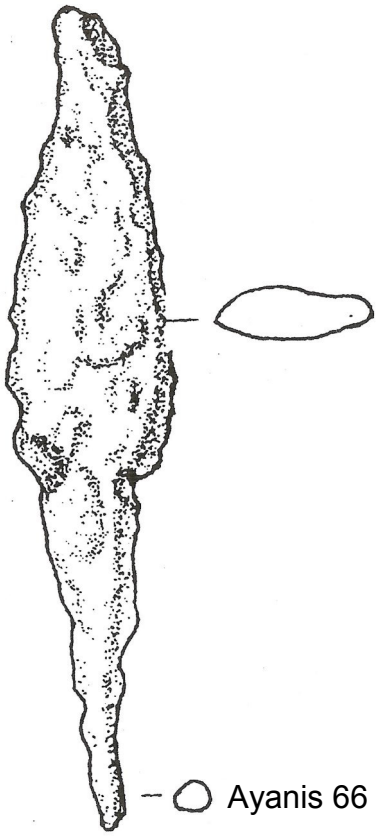
Site	No.	Type	Item No.	Source
Tell Knedig	9	5b-1	1119g	Klengel-Brandt et al 2005, p. 306, pl. 201
Ayanis	45	5b-1	45	Derın & Muscarella 2001, fig. 4
Lachish	170	5b-1	60872/60	Gottlieb 2004, p. 1923, fig. 27.6:9
Lachish	193	5b-1	61583/60	Gottlieb 2004, p. 1925, fig. 27.7:12
Lachish	89	5b-1	8525/60	Gottlieb 2004, p. 1911, fig. 27.1:18

Type 5b-1 (continued)

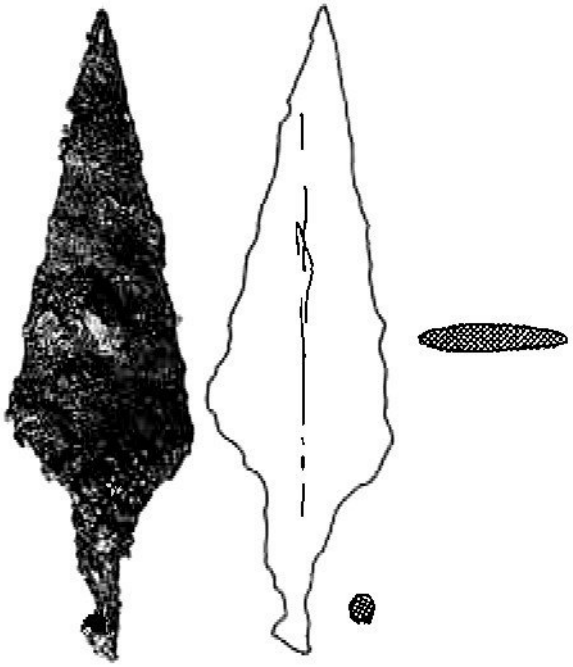


Lachish 101

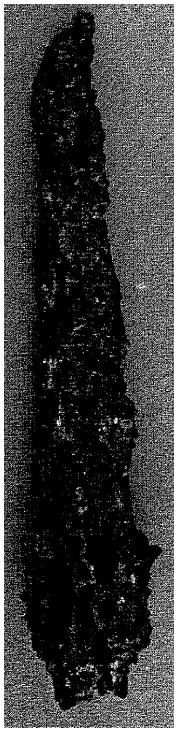
Knedig 3



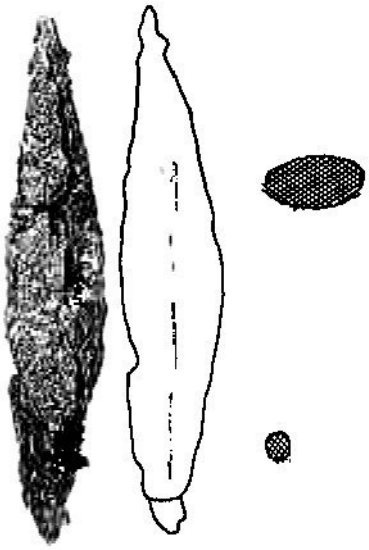
Ayanis 66



Lachish 224



Knedig 7



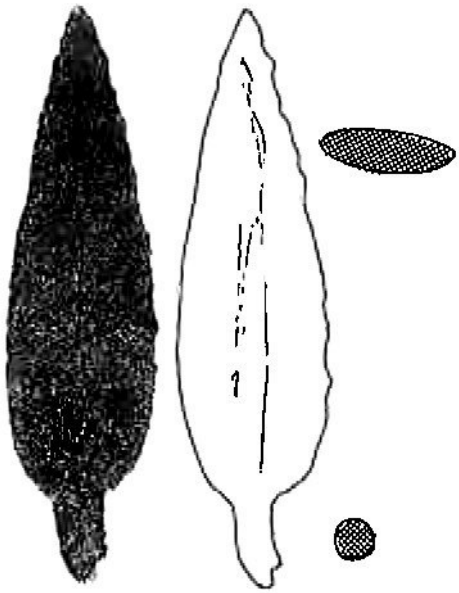
Lachish 210

Sources:

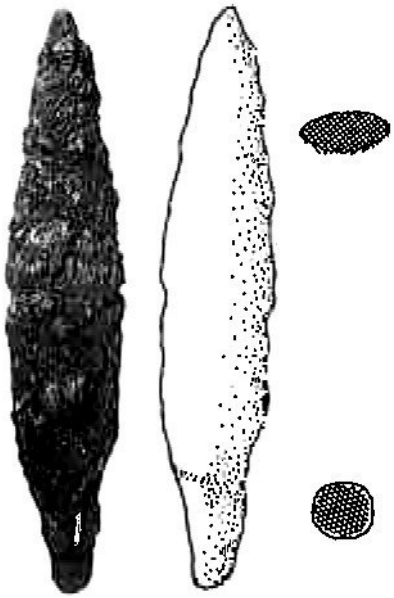
Site	No.	Type	Item No.	Source
Lachish	101	5b-1	30050/60	Gottlieb 2004, p. 1915, fig. 27.2:11
Tell Knedig	3	5b-1	1119a	Klengel-Brandt et al 2005, p. 306, pl. 201
Ayanis	66	5b-1	66	Derın & Muscarella 2001, fig. 5
Lachish	224	5b-1	61661/60	Gottlieb 2004, p. 1929, fig. 27.9:2
Tell Knedig	7	5b-1	1119e	Klengel-Brandt et al 2005, p. 306, pl. 201
Lachish	210	5b-1	61040	Gottlieb 2004, p. 1927, fig. 27.8:9

Plate 162

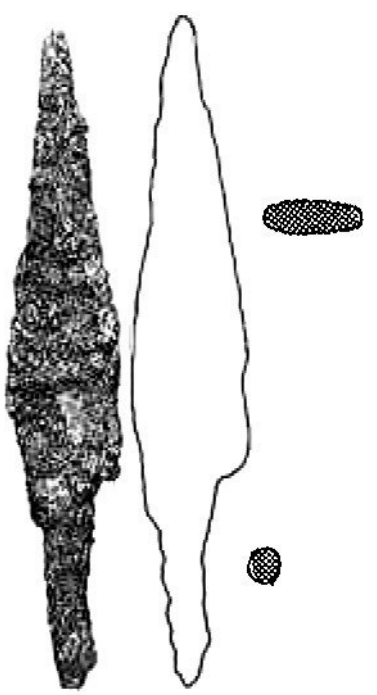
Type 5b-1 (continued)



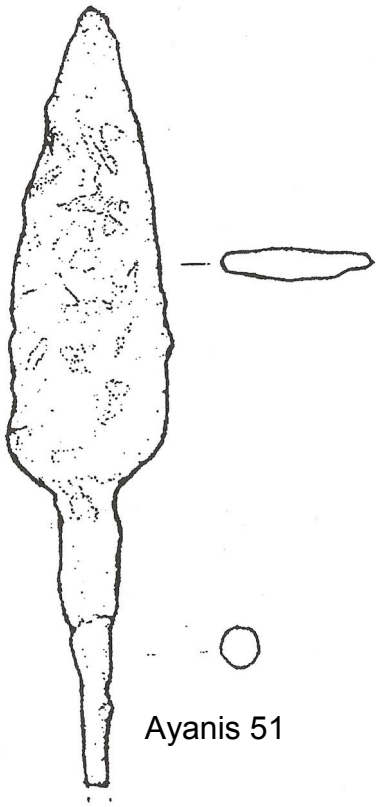
Lachish 221



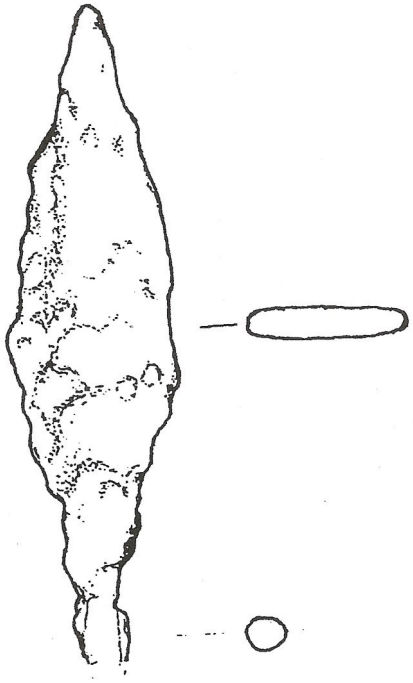
Lachish 100



Lachish 192



Ayanis 51

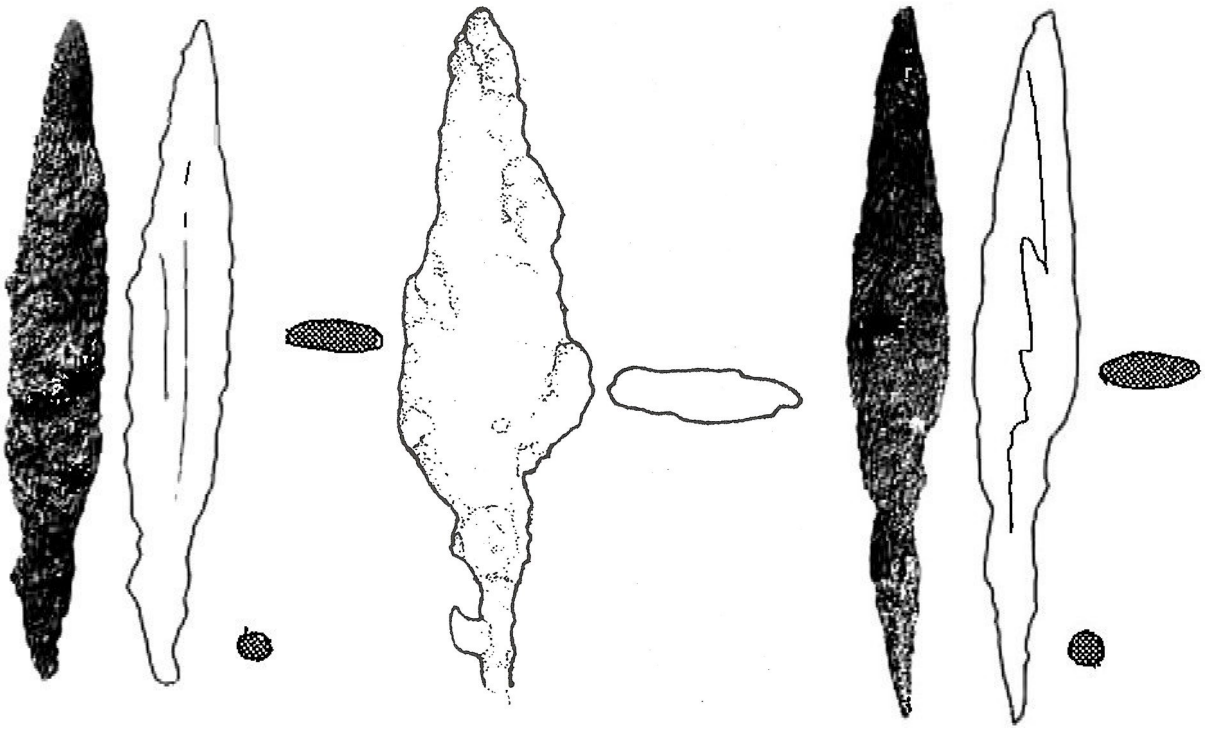


Ayanis 60

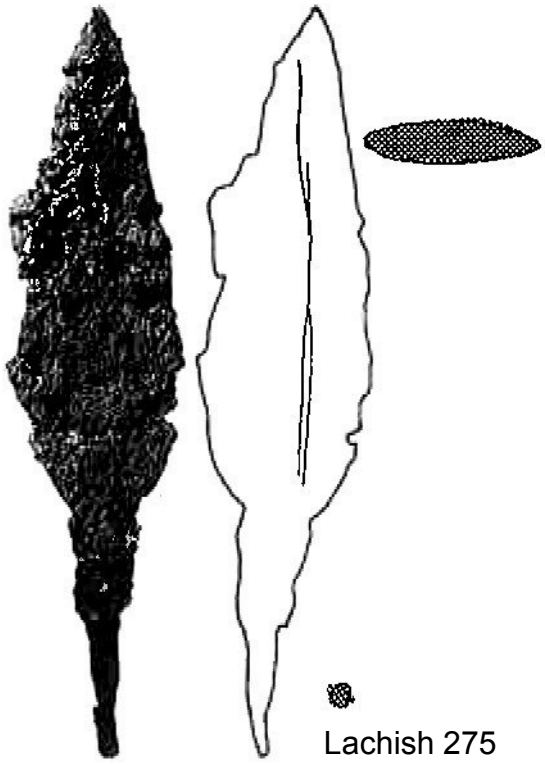
Sources:

Site	No.	Type	Item No.	Source
Lachish	221	5b-1	61908/60	Gottlieb 2004, p. 1927, fig. 27.8:20
Lachish	100	5b-1	10406/60	Gottlieb 2004, p. 1915, fig. 27.2:10
Lachish	192	5b-1	60584/60	Gottlieb 2004, p. 1925, fig. 27.7:11
Ayanis	51	5b-1	51	Derın & Muscarella 2001, fig. 4
Ayanis	60	5b-1	60	Derın & Muscarella 2001, fig. 5

Type 5b-1 (continued)



Lachish 150 Ayanis 62 Lachish 153

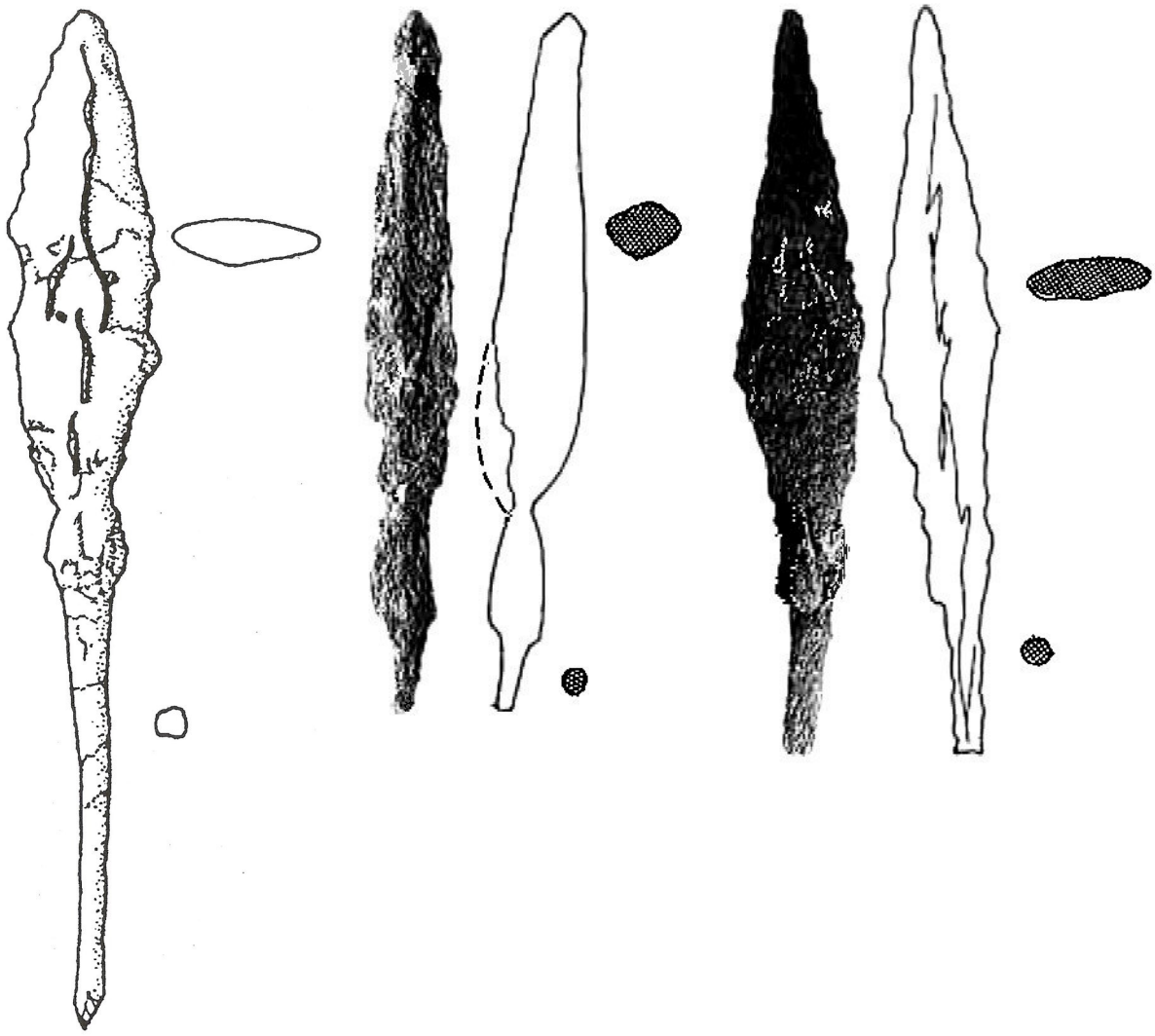


Lachish 275

Sources:

Site	No.	Type	Item No.	Source
Lachish	150	5b-1	62255/60	Gottlieb 2004, p. 1921, fig. 27.5:8
Ayanis	62	5b-1	62	Derın & Muscarella 2001, fig. 5
Lachish	153	5b-1	61269/60	Gottlieb 2004, p. 1921, fig. 27.5:11
Lachish	275	5b-1	61959/60	Gottlieb 2004, p. 1935, fig. 27.12:1

Type 5b-1 (continued)



Ayanis 64 Lachish 95 Lachish 276

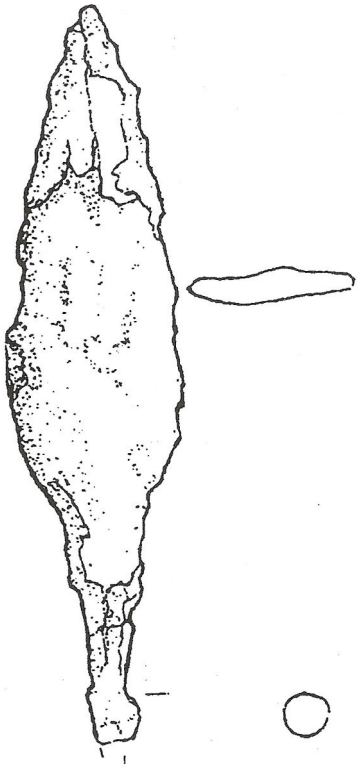
Sources:

Site	No.	Type	Item No.	Source
Ayanis	64	5b-1	64	Derın & Muscarella 2001, fig. 5
Lachish	95	5b-1	31801/61	Gottlieb 2004, p. 1915, fig. 27.2:5
Lachish	276	5b-1	61569/60	Gottlieb 2004, p. 1935, fig. 27.12:2

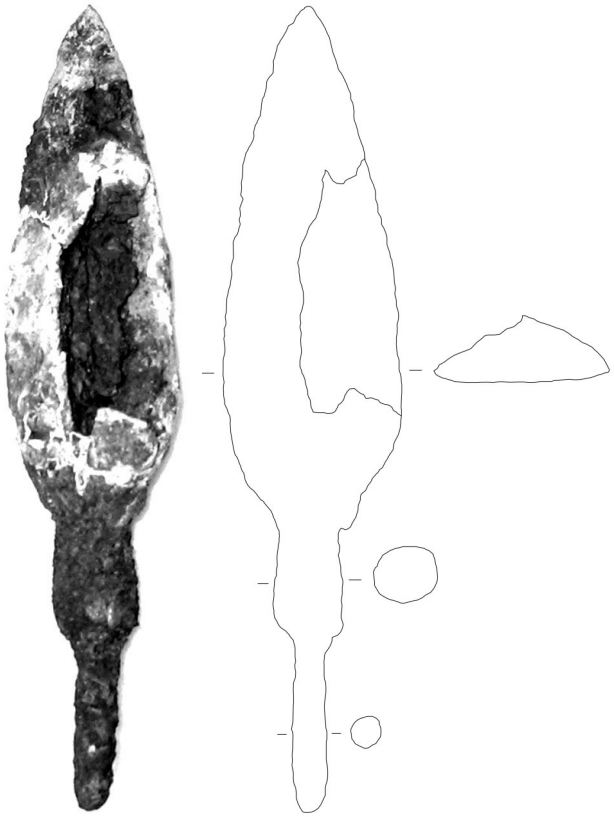
Sources for Plate 165:

Ayanis	67	5b-1	67	Derın & Muscarella 2001, fig. 5
Nimrud	13	5b-1	ND 10944	British Museum
Lachish	156	5b-1	61815/60	Gottlieb 2004, p. 1921, fig. 27.5:14
Lachish	160	5b-1	60611/60	Gottlieb 2004, p. 1921, fig. 27.5:19

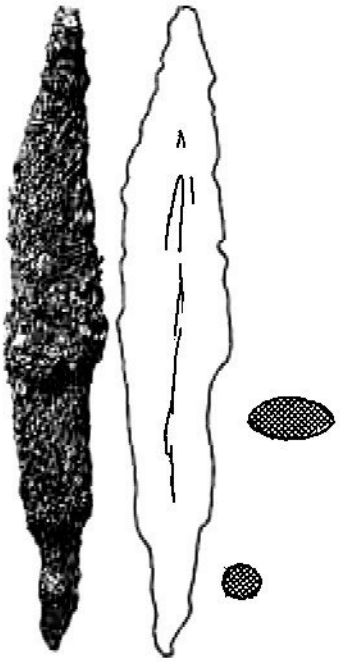
Type 5b-1 (continued)



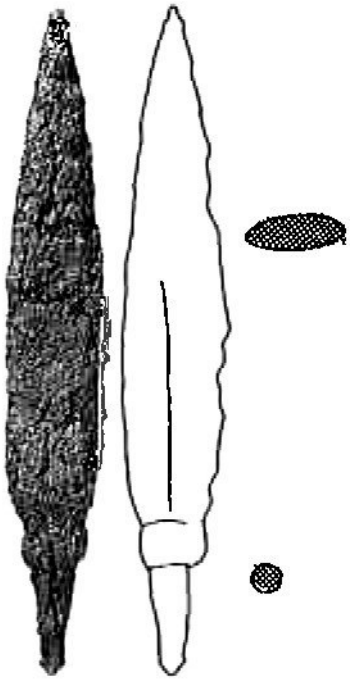
Ayanis 67



Nimrud 13



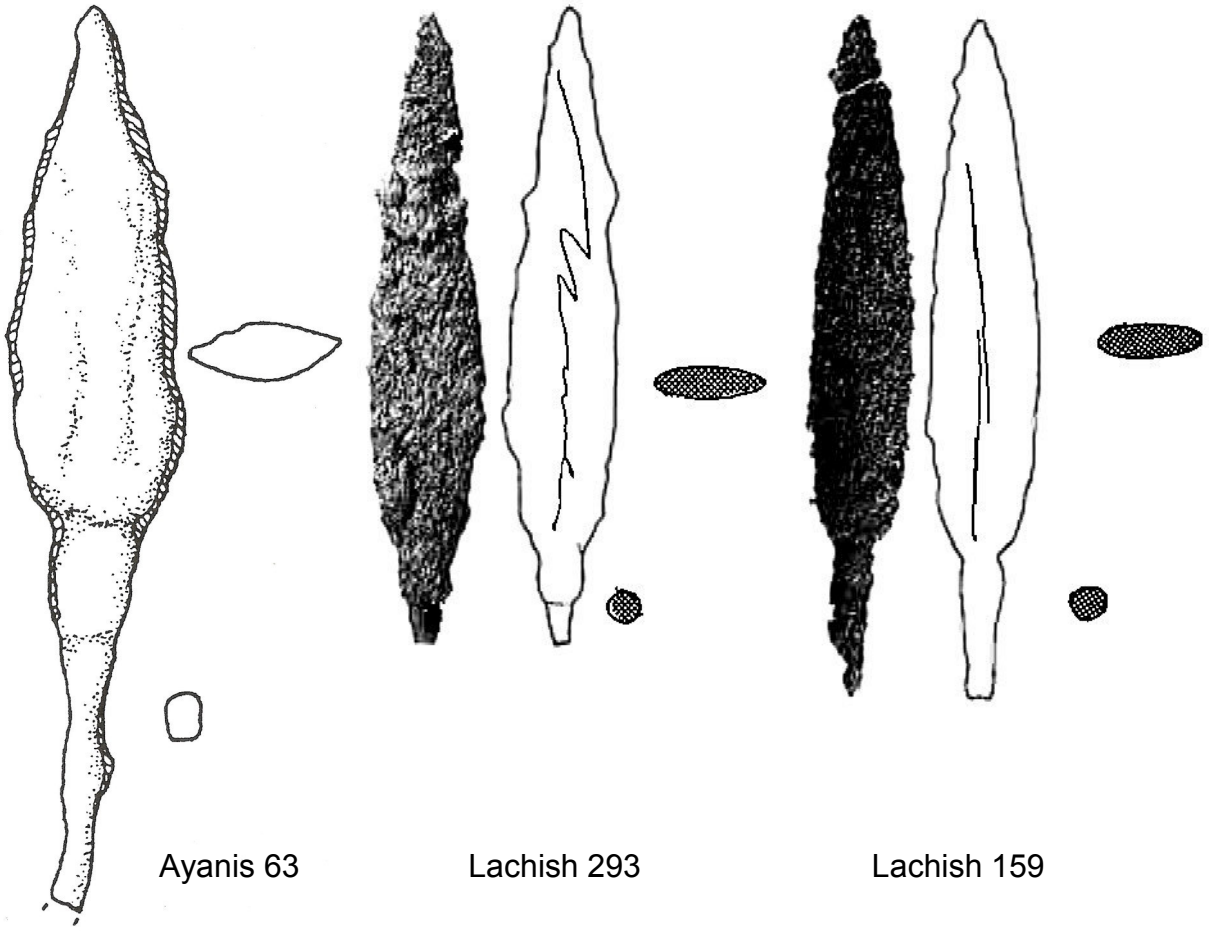
Lachish 156



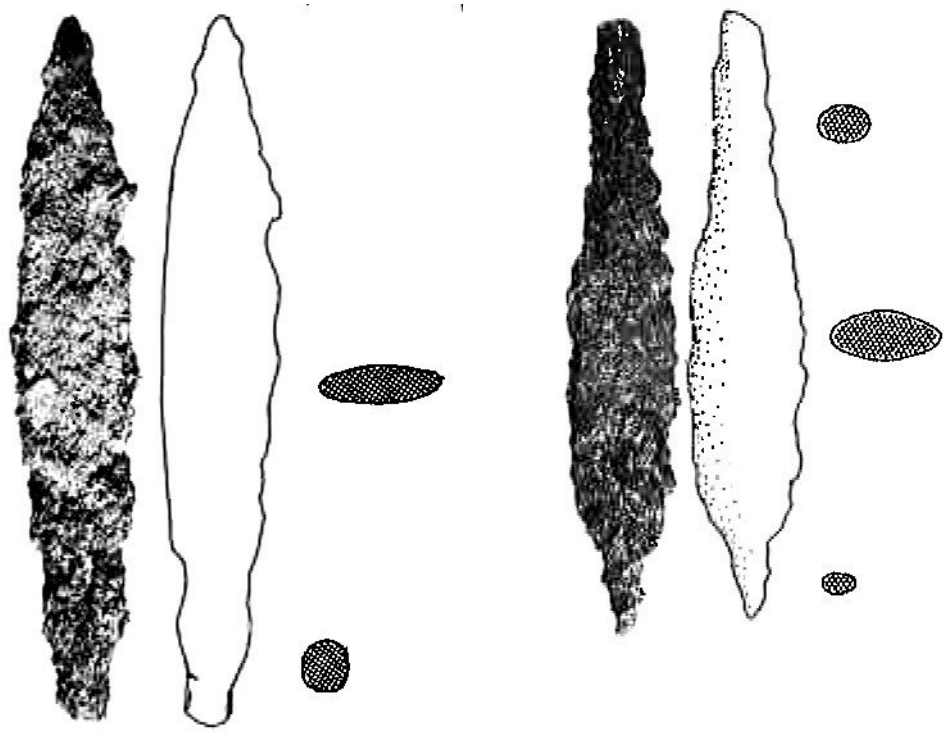
Lachish 160

Sources: see Plate 164

Type 5b-1 (continued)



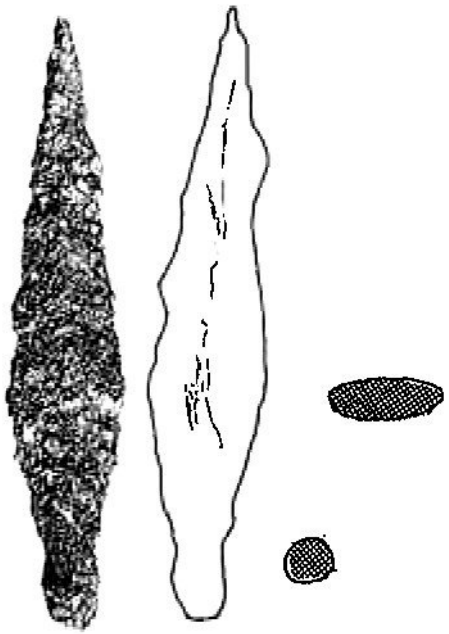
Ayanis 63 Lachish 293 Lachish 159



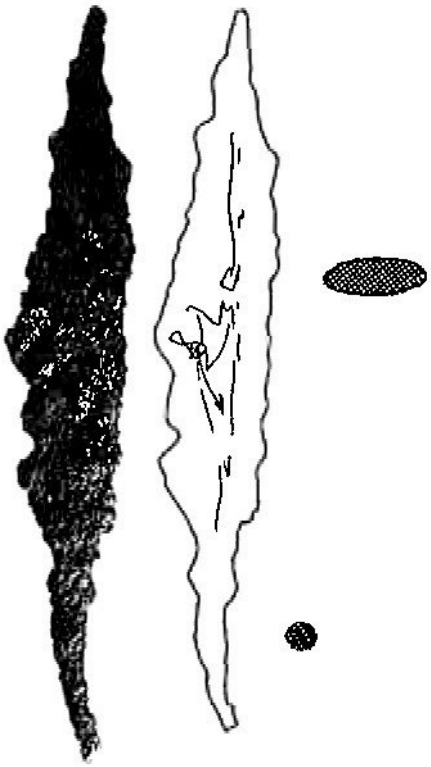
Lachish 354 Lachish 107

Sources: see Plate 167

Type 5b-1 (continued)



Lachish 166



Lachish 146

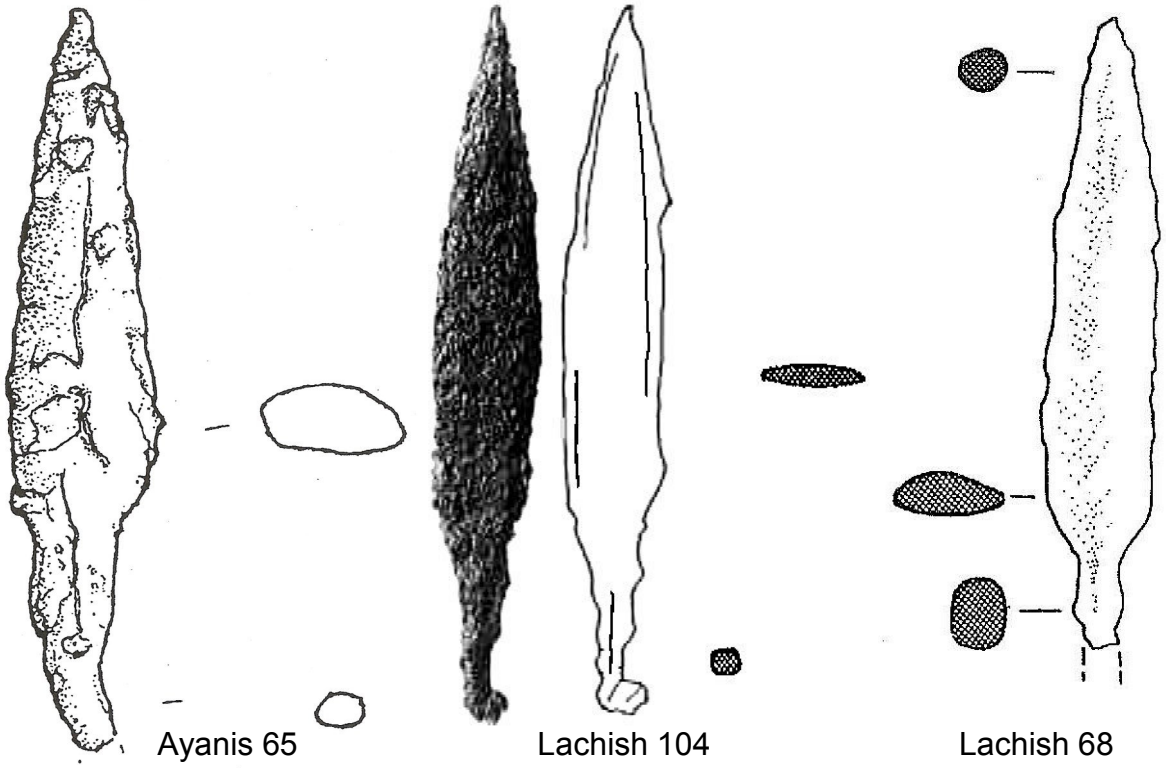
Sources for Plate 166:

Site	No.	Type	Item No.	Source
Ayanis	63	5b-1	63	Derın & Muscarella 2001, fig. 5
Lachish	293	5b-1	61657	Gottlieb 2004, p. 1935, fig. 27.12:19
Lachish	159	5b-1	60999/60	Gottlieb 2004, p. 1921, fig. 27.5:18
Lachish	354	5b-1	7139A	Gottlieb 2004, p. 1943, fig. 27.16:17
Lachish	107	5b-1	31284/60	Gottlieb 2004, p. 1917, fig. 27.3:1

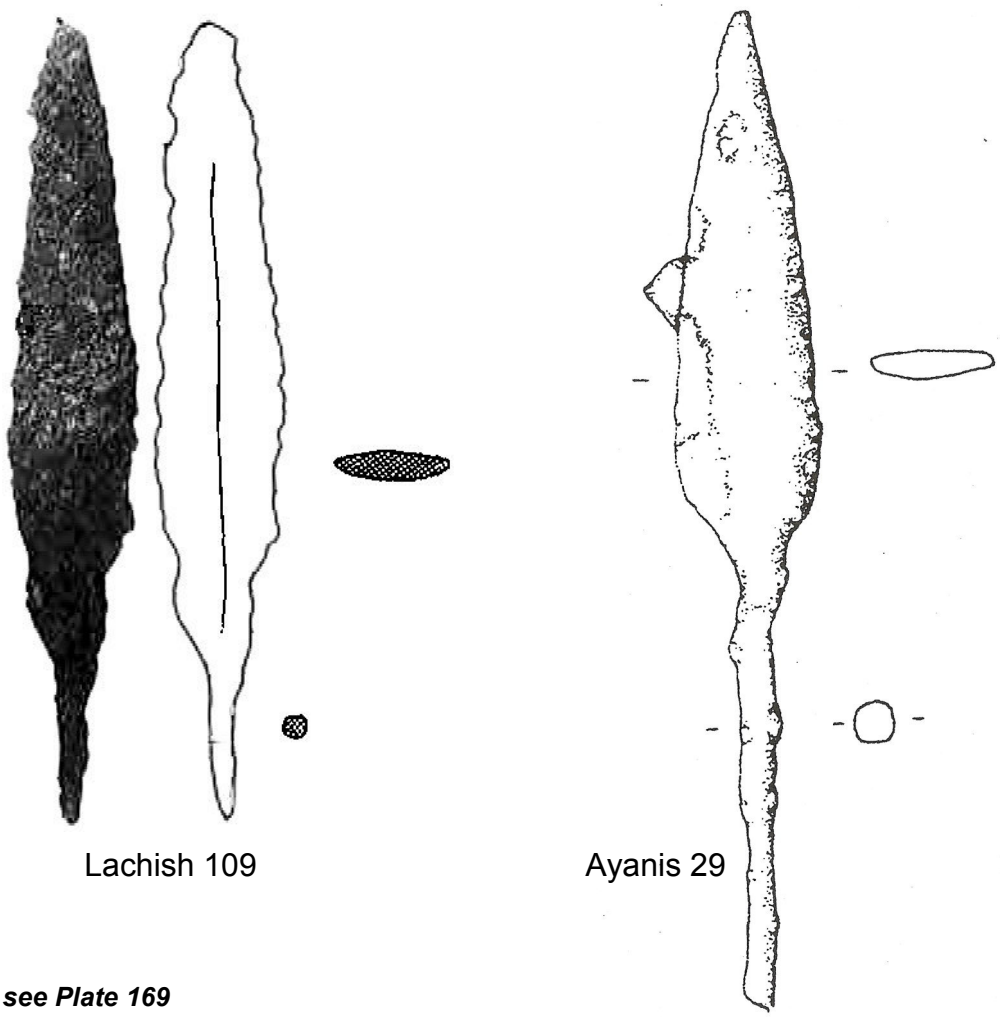
Sources for Plate 167:

Lachish	166	5b-1	62260	Gottlieb 2004, p. 1923, fig. 27.6:5
Lachish	146	5b-1	61963/60	Gottlieb 2004, p. 1921, fig. 27.5:4

Type 5b-1 (continued)



Ayanis 65 Lachish 104 Lachish 68

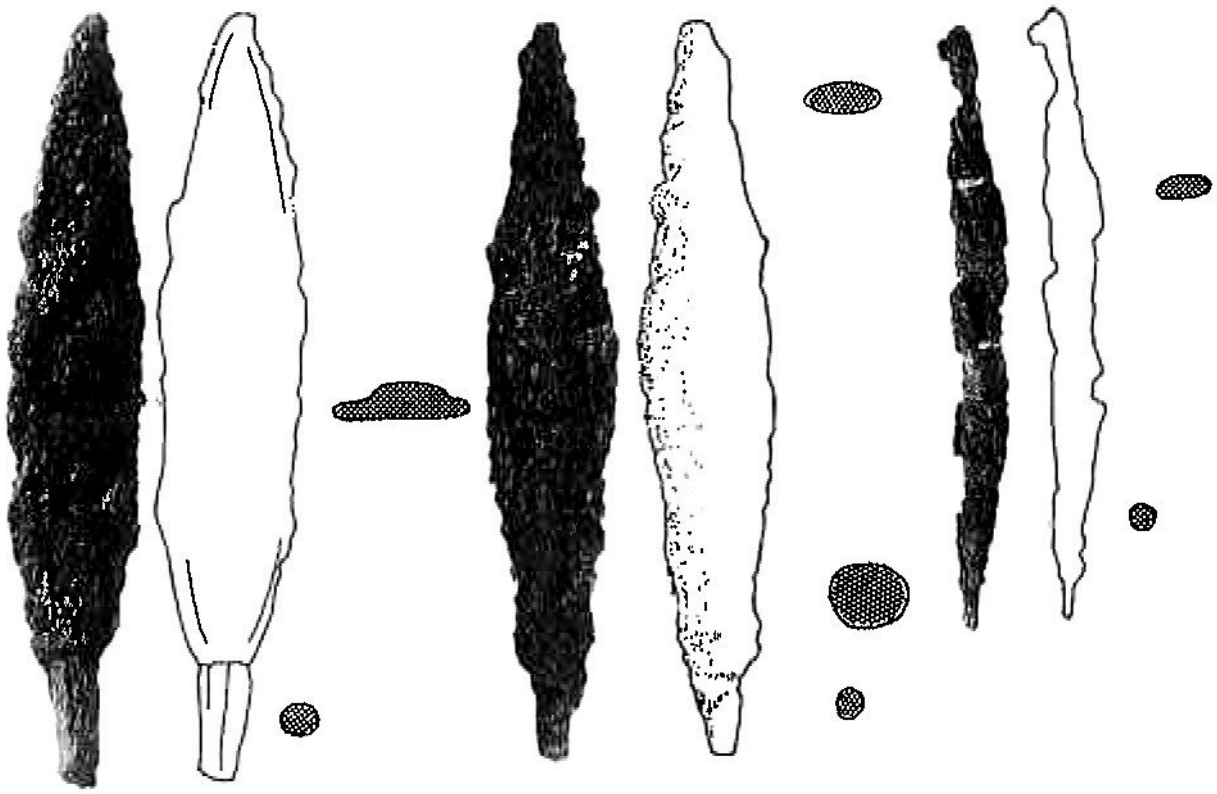


Lachish 109 Ayanis 29

Sources: see Plate 169

Plate 169

Type 5b-1 (continued)



Lachish 111 Lachish 110 Lachish 201

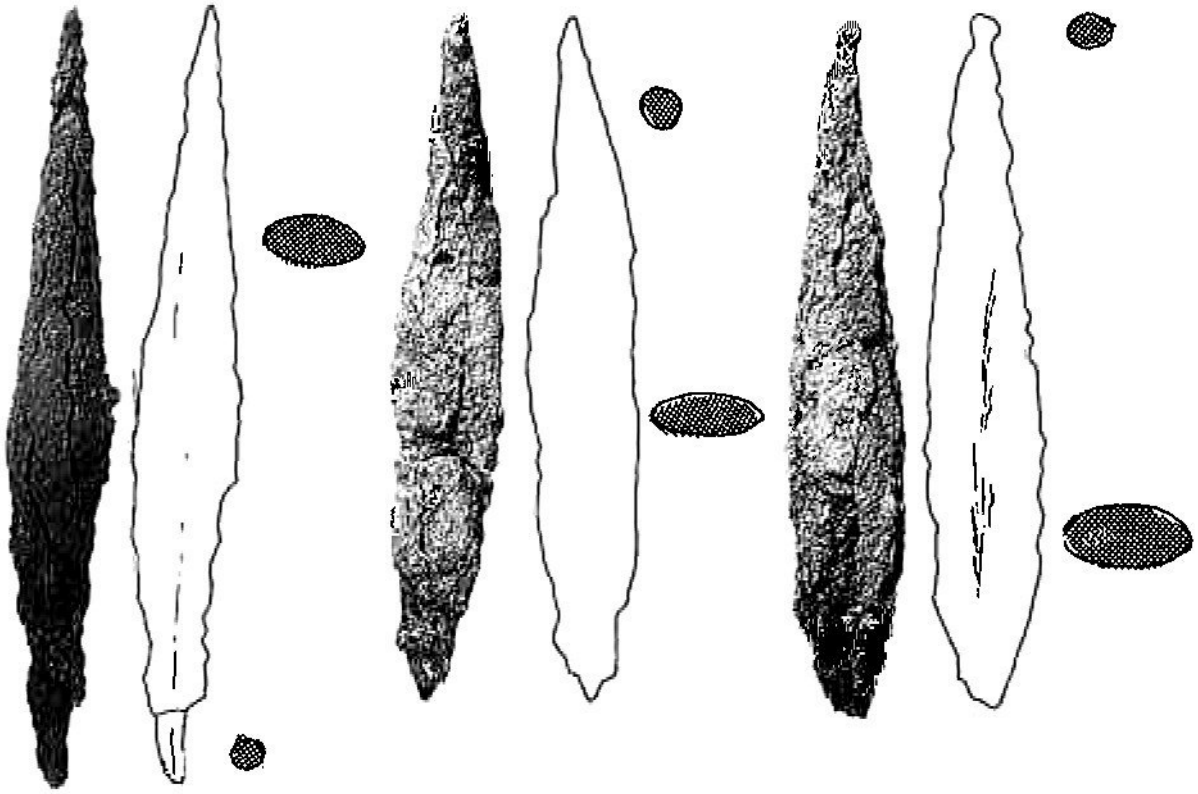
Sources for Plate 168:

Site	No.	Type	Item No.	Source
Ayanis	65	5b-1	65	Derın & Muscarella 2001, fig. 5
Lachish	104	5b-1	35130/60	Gottlieb 2004, p. 1915, fig. 27.2:15
Lachish	68	5b-1	315/60	Rothenberg 1975, p. 75, pl. 29:1 & 36:4
Lachish	109	5b-1	38838/60	Gottlieb 2004, p. 1917, fig. 27.3:3
Ayanis	29	5b-1	29	Derın & Muscarella 2001, fig. 3

Sources for Plate 169:

Lachish	111	5b-1	31569/60	Gottlieb 2004, p. 1917, fig. 27.3:5
Lachish	110	5b-1	8517/60	Gottlieb 2004, p. 1917, fig. 27.3:4
Lachish	201	5b-1	60890	Gottlieb 2004, p. 1925, fig. 27.7:20

Type 5b-1 (continued)



Lachish 277 Lachish 163 Lachish 162

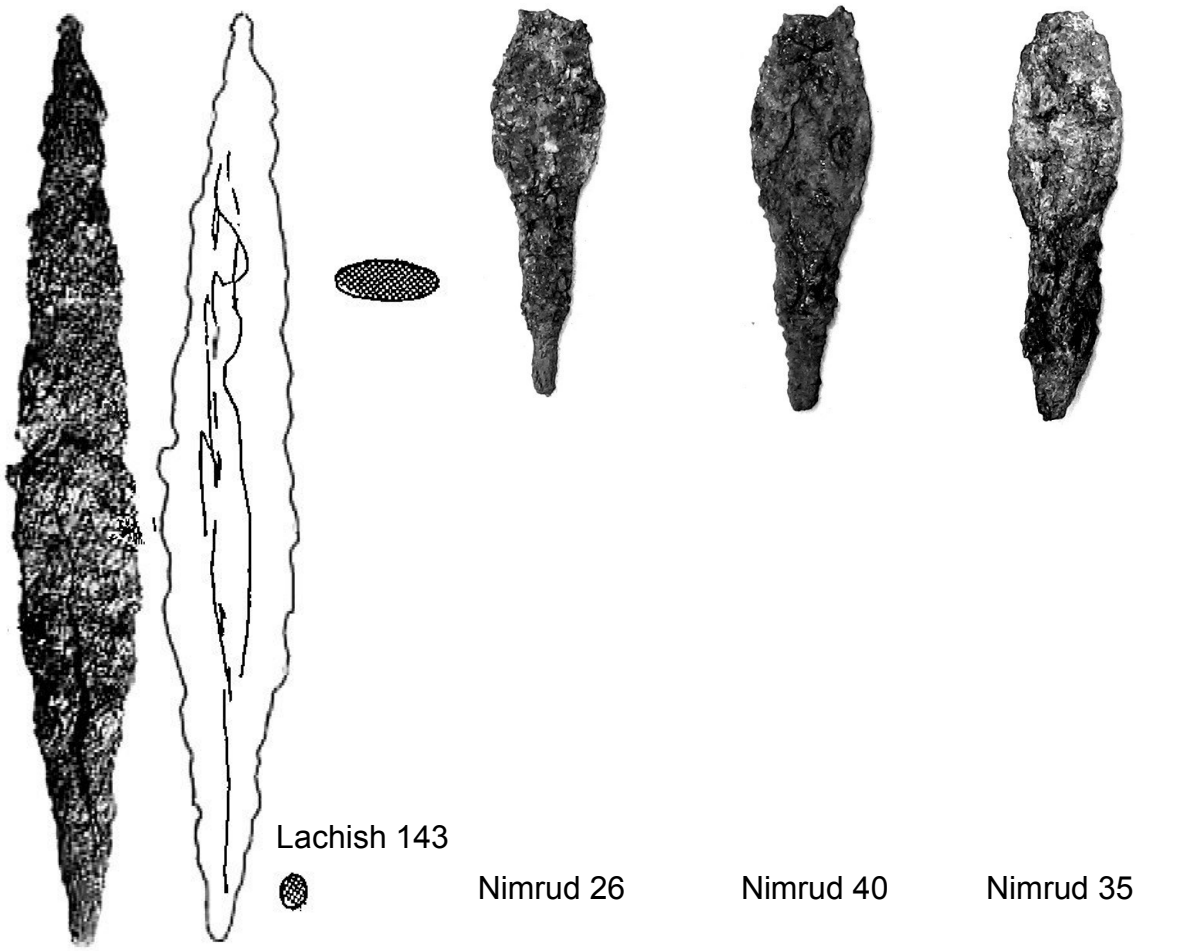
Sources:

Site	No.	Type	Item No.	Source
Lachish	277	5b-1	61907/60	Gottlieb 2004, p. 1935, fig. 27.12:3
Lachish	163	5b-1	60741/60	Gottlieb 2004, p. 1923, fig. 27.6:2
Lachish	162	5b-1	60550/60	Gottlieb 2004, p. 1923, fig. 27.6:1

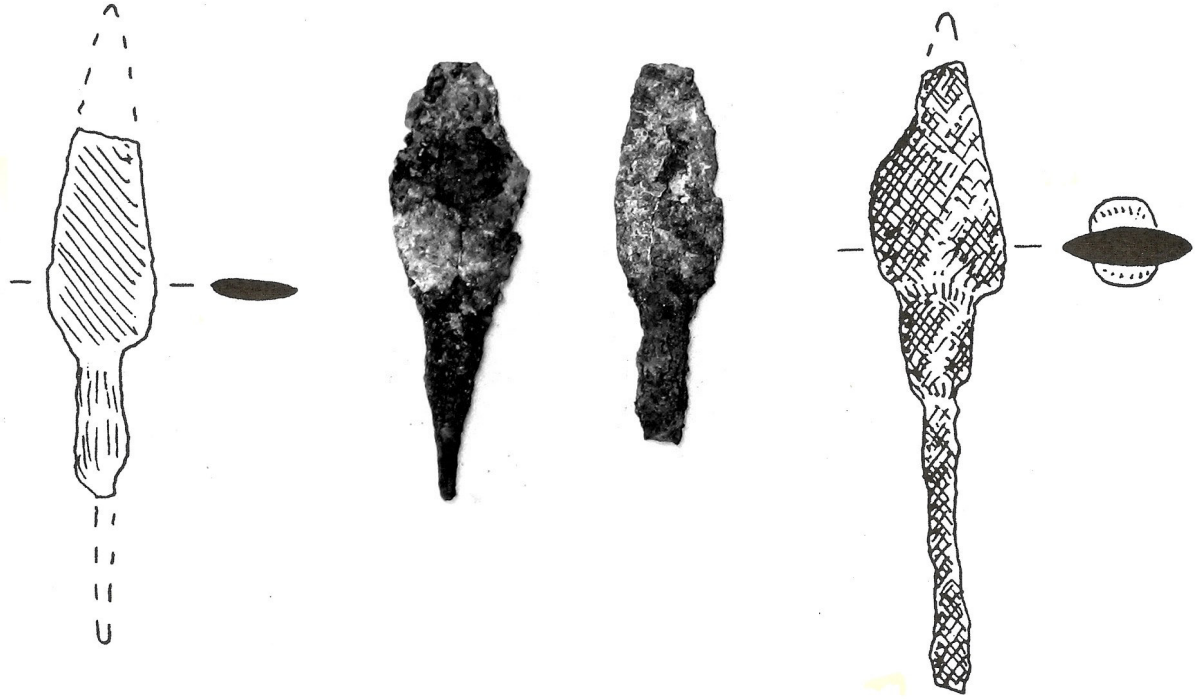
Sources for Plate 171:

Lachish	143	5b-1	61010/60	Gottlieb 2004, p. 1921, fig. 27.5:1
Nimrud	26	5b-1	ND 10944	British Museum
Nimrud	40	5b-1	ND 10944	British Museum
Nimrud	35	5b-1	ND 10944	British Museum
Bastam	5	5b-1	75/34	Kroll 1979, p. 160; Abb. 9:5
Nimrud	41	5b-1	ND 10944	British Museum
Nimrud	27	5b-1	ND 10944	British Museum
Bastam	1	5b-1	73/22	Kroll 1979, p. 154; Abb 1:15

Type 5b-1 (continued)



Lachish 143 Nimrud 26 Nimrud 40 Nimrud 35

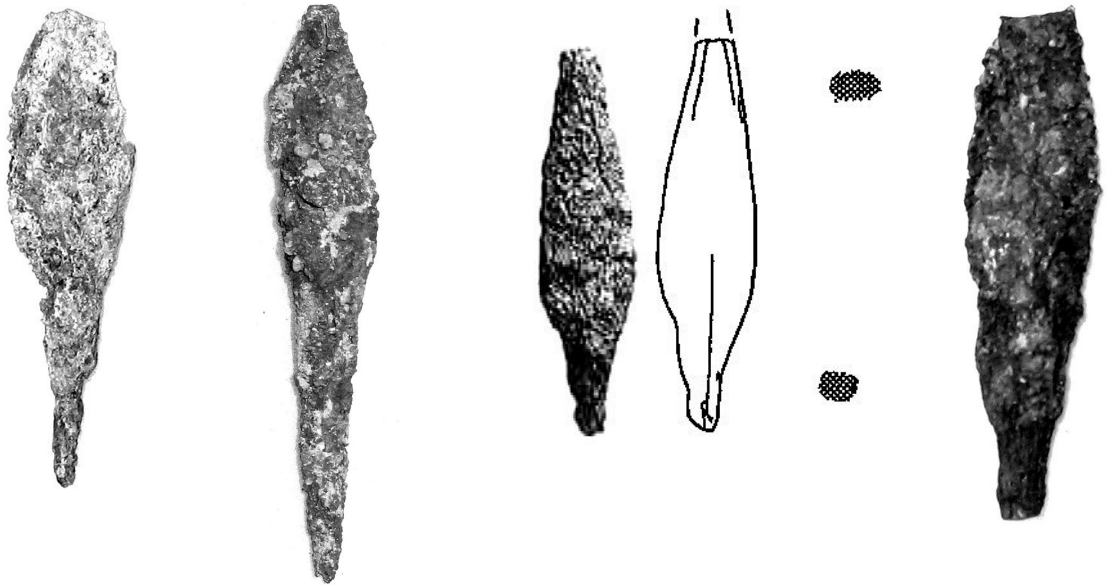


Bastam 5 Nimrud 41 Nimrud 27 Bastam 1

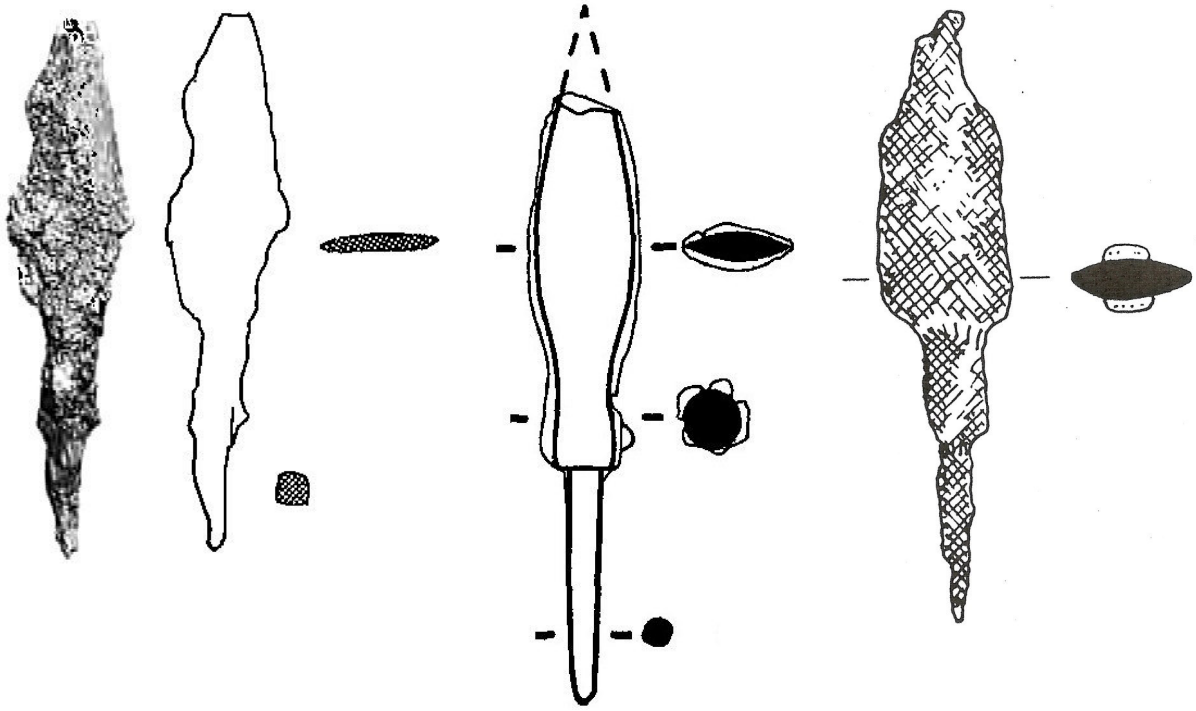
Sources: see Plate 170

Plate 172

Type 5b-1 (continued)



Nimrud 38 Nimrud 238 Lachish 86 Nimrud 30



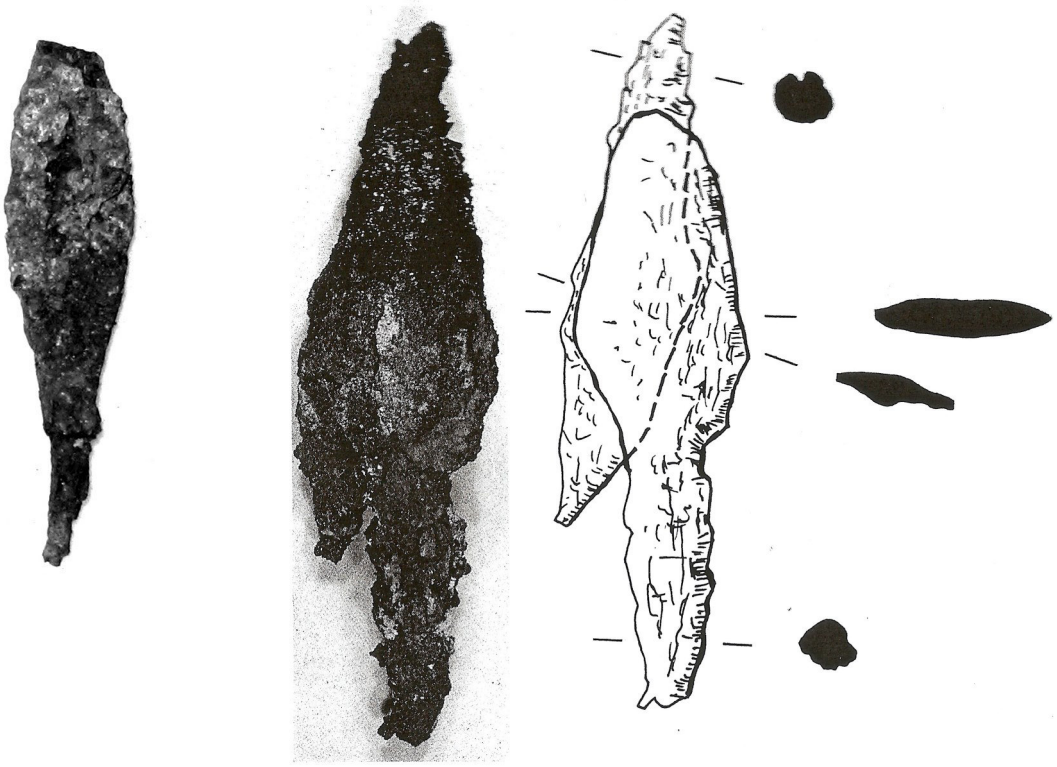
Lachish 91 Hasanlu 23 Bastam 13

Sources:

Site	No.	Type	Item No.	Source
Nimrud	38	5b-1	ND 10944	British Museum
Nimrud	238	5b-1	ND 10944	British Museum
Lachish	86	5b-1	40701/60	Gottlieb 2004, p. 1911, fig. 27.1:15
Nimrud	30	5b-1	ND 10944	British Museum
Lachish	91	5b-1	31801/64	Gottlieb 2004, p. 1915, fig. 27.2:1
Hasanlu	23	5b-1	HAS 72-N444 b	Thornton & Pigott 2011, p. 142, fig. 6.3:6
Bastam	13	5b-1	73/36	Kroll 1979, p. 166; Abb 16:4

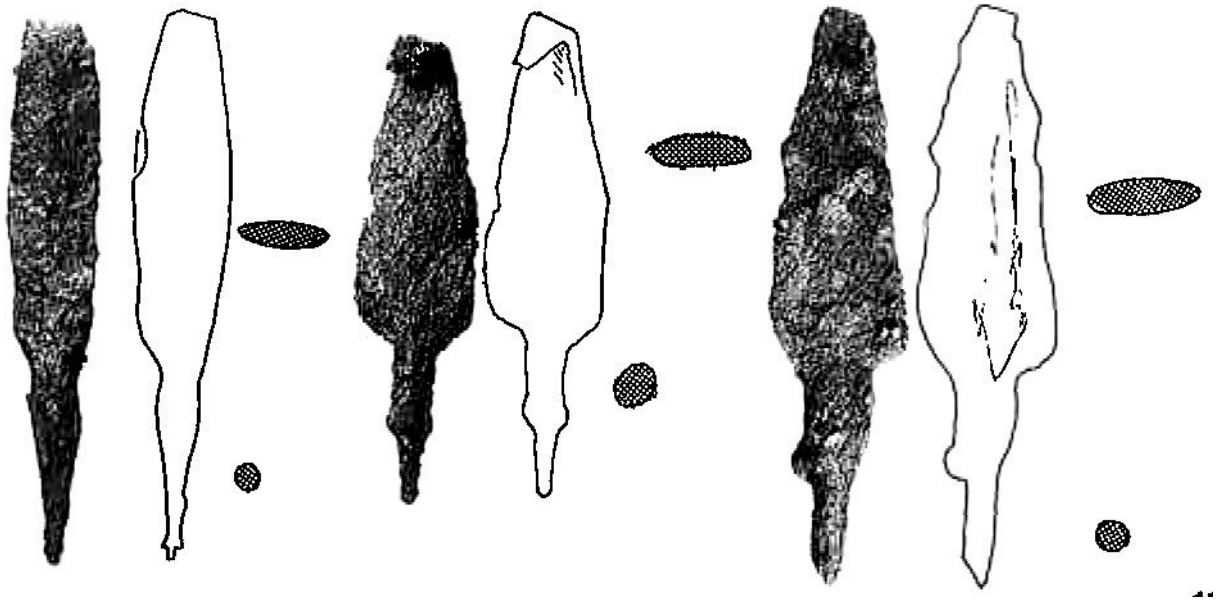
Plate 173

Type 5b-1 (continued)



Nimrud 33

Uruk 7
(upper arrowhead)

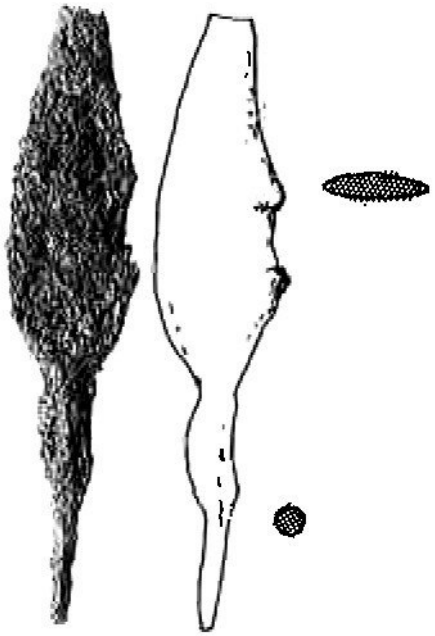


Lachish 106 Lachish 327 Lachish 219

Sources:

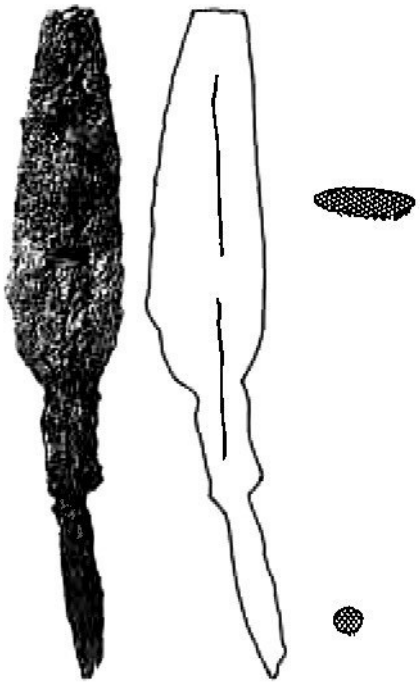
Site	No.	Type	Item No.	Source
Nimrud	33	5b-1	ND 10944	British Museum
Uruk	7	5b-1	W 21898, 2	van Ess & Pedde 1992, p. 68, no. 751
Lachish	106	5b-1	8488/60	Gottlieb 2004, p. 1915, fig. 27.2:17
Lachish	327	5b-1	62059/60	Gottlieb 2004, p. 1939, fig. 27.14:12
Lachish	219	5b-1	61220/60	Gottlieb 2004, p. 1927, fig. 27.8:18

Type 5b-1 (continued)

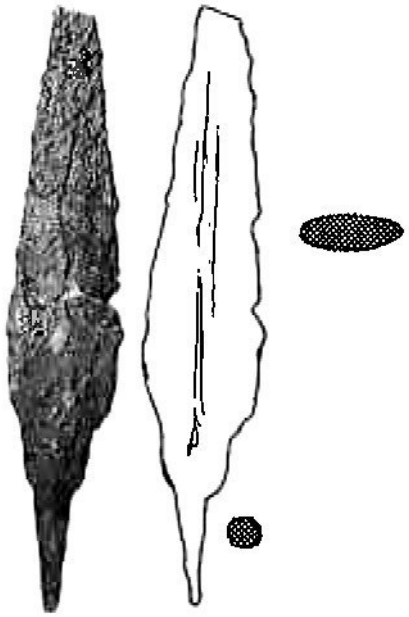


Lachish 94

Nimrud 252

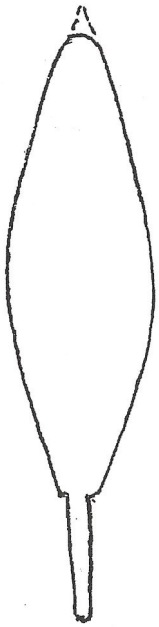


Lachish 290



Lachish 105

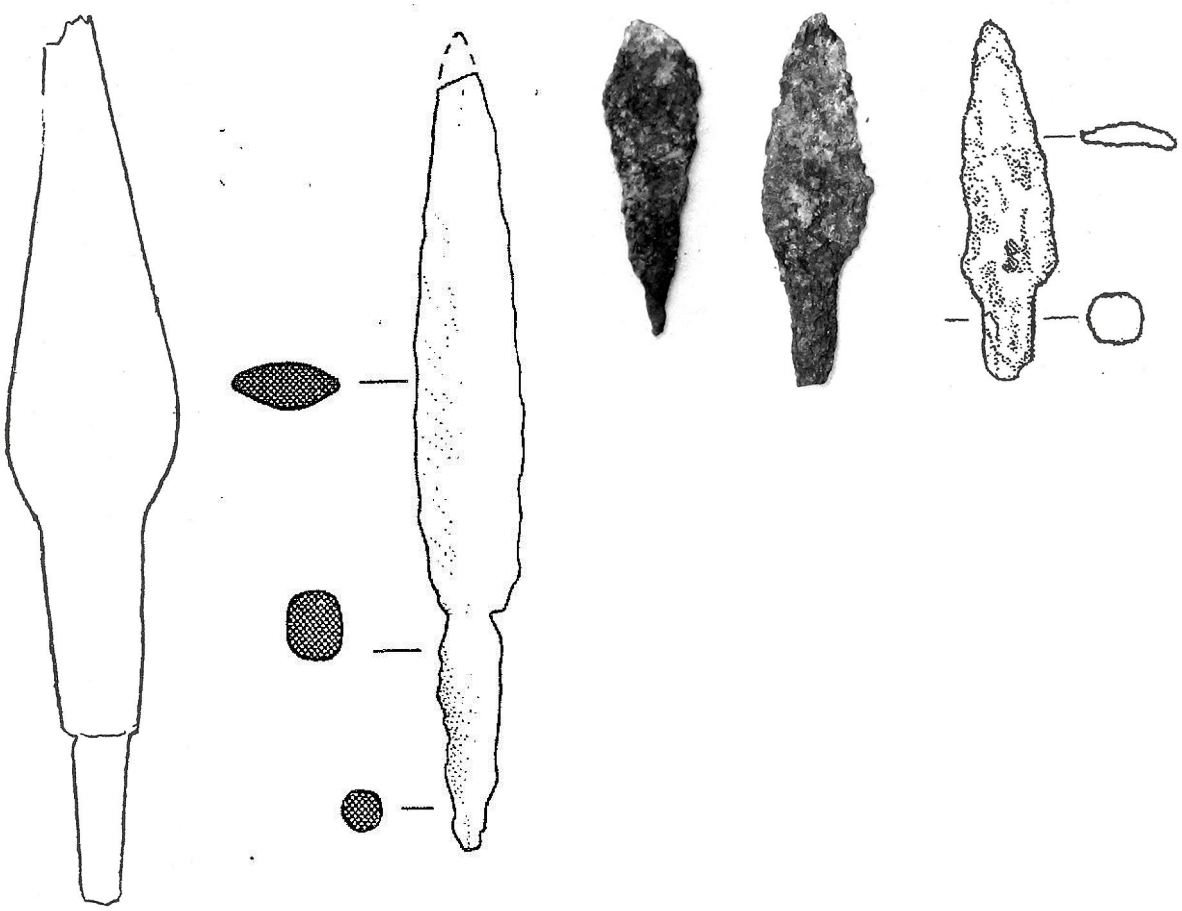
Nimrud 236



Gerar 68

Sources: see Plate 175

Type 5b-1 (continued)



Gerar 6 Lachish 66 Nimrud 28 Nimrud 20 Ayanis 16

Sources for Plate 174:

Site	No.	Type	Item No.	Source
Lachish	94	5b-1	31801/60	Gottlieb 2004, p. 1915, fig. 27.2:4
Nimrud	252	5b-1	ND 3355	British Museum
Lachish	290	5b-1	60619/60	Gottlieb 2004, p. 1935, fig. 27.12:16
Lachish	105	5b-1	38100/60	Gottlieb 2004, p. 1915, fig. 27.2:16
Nimrud	236	5b-1	ND 9268	British Museum
Gerar	68	5b-1!	pl. 29:53	Petrie 1928, pl. 29:53

Sources for Plate 175:

Gerar	6	5b-1	pl. 28:04	Petrie 1928, pl. 28:04
Lachish	66	5b-1	350/60	Rothenberg 1975, p. 74, pl. 36:2
Nimrud	28	5b-1?	ND 10944	British Museum
Nimrud	20	5b-1?	ND 10944	British Museum
Ayanis	16	5b-1?	16	Derın & Muscarella 2001, fig. 2

Plate 176

Type 5b-1 (continued)

Nimrud 22

Nimrud 23

Nimrud 19

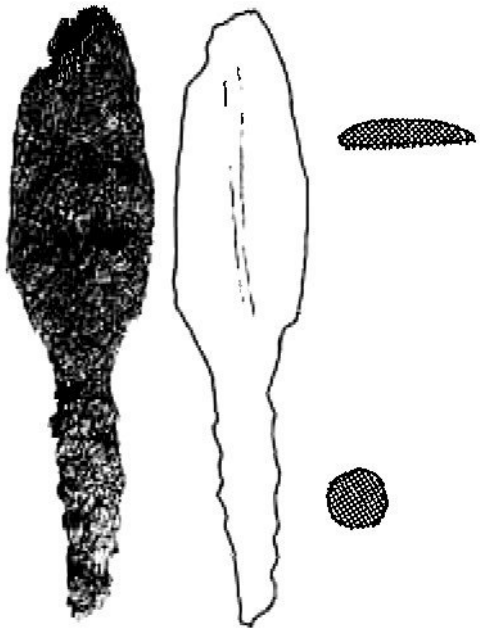
Nimrud 239

Uruk 8
(lower arrowhead)

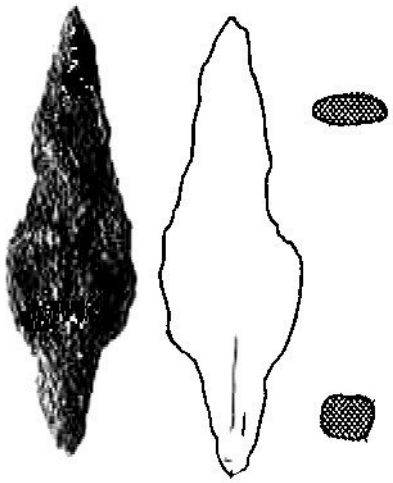
Sources:

Site	No.	Type	Item No.	Source
Nimrud	22	5b-1?	ND 10944	British Museum
Nimrud	23	5b-1?	ND 10944	British Museum
Nimrud	19	5b-1?	ND 10944	British Museum
Nimrud	239	5b-1?	ND 10944	British Museum
Uruk	8	5b-1?	W 21898, 3	van Ess & Pedde 1992, p. 68, no. 751

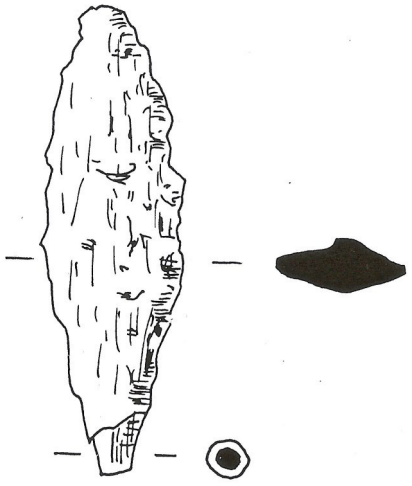
Type 5b-1 (continued)



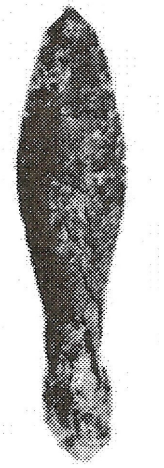
Lachish 249



Lachish 96



Uruk 10

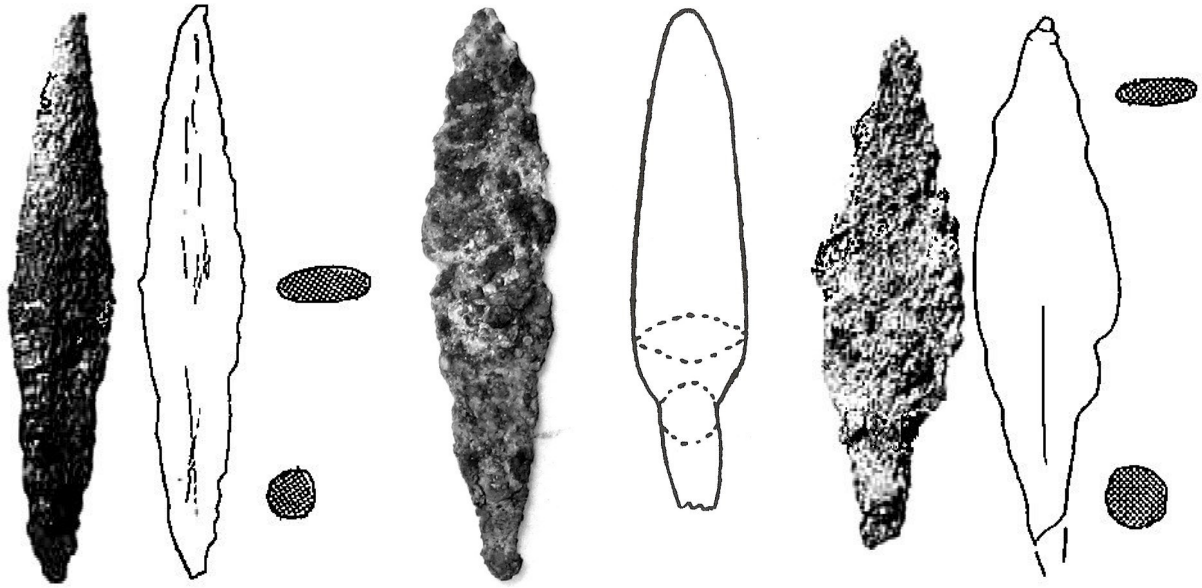


Fakhariya 10

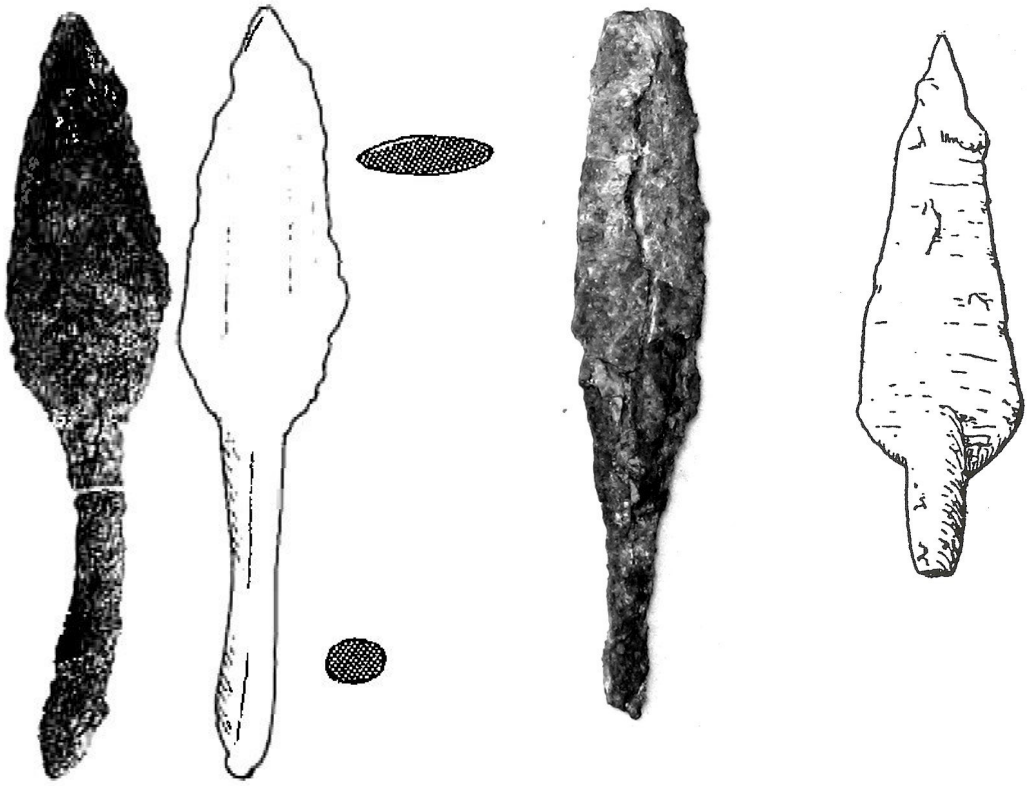
Sources:

Site	No.	Type	Item No.	Source
Lachish	249	5b-1?	62237	Gottlieb 2004, p. 1931, fig. 27.10:10
Lachish	96	5b-1?	31801/68	Gottlieb 2004, p. 1915, fig. 27.2:6
Uruk	10	5b-1?	W 21898, 5	van Ess & Pedde 1992, p. 68, no. 751
Fakhariya	10	5b-1?	F237j	McEwan et al 1957, p. 46, pl. 45:11

Type 5b-1 (continued)



Lachish 164 Nimrud 6 Lachish 21 Lachish 364

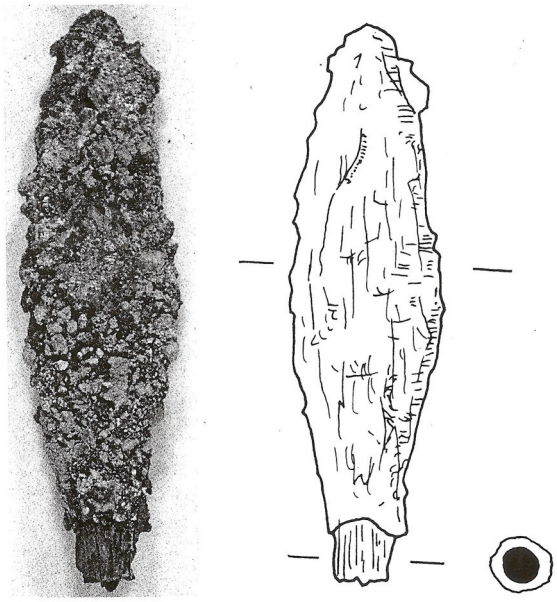


Lachish 223 Nimrud 16 Carchemish 34

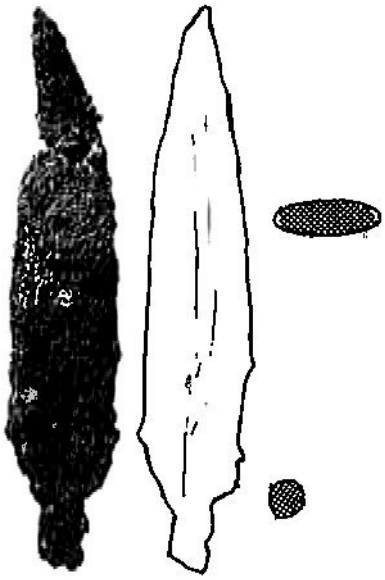
Sources:

Site	No.	Type	Item No.	Source
Lachish	164	5b-1?	60330/60	Gottlieb 2004, p. 1923, fig. 27.6:3
Nimrud	6	5b-1?	ND 9268	British Museum
Lachish	21	5b-1?	Pl. 60,9	Tufnell et al 1953, p. 109, pl. 60:9
Lachish	364	5b-1?	6290	Gottlieb 2004, p. 1947, fig. 27.18:13
Lachish	223	5b-1?	60821/60	Gottlieb 2004, p. 1929, fig. 27.9:1
Nimrud	16	5b-1?	ND 10944	British Museum
Carchemish	34	5b-1?	Pl. 22,6	Wooley 1921, Pl. 23,6

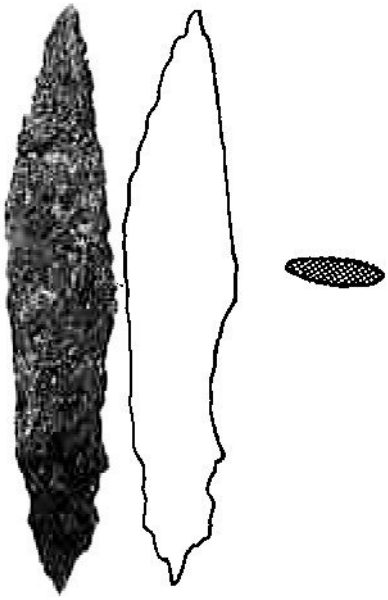
Type 5b-1 (continued)



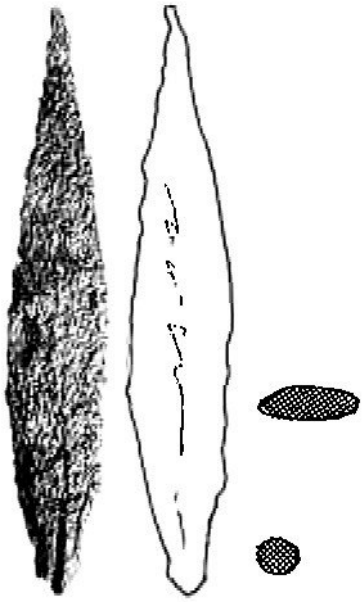
Uruk 9



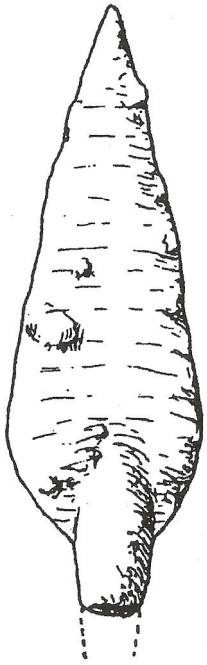
Lachish 215



Lachish 92



Lachish 165

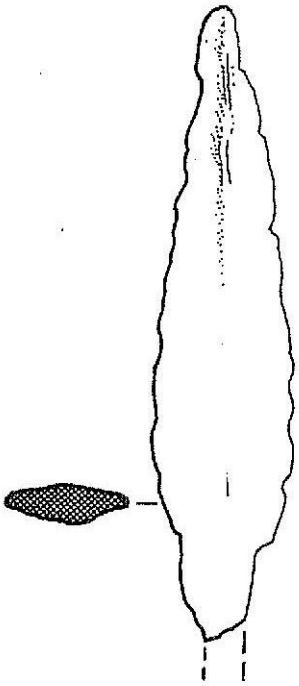


Carchemish 32

Sources:

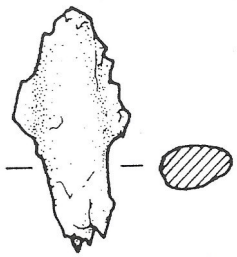
Site	No.	Type	Item No.	Source
Uruk	9	5b-1?	W 21898, 4	van Ess & Pedde 1992, p. 68, no. 751
Lachish	215	5b-1?	61960/60	Gottlieb 2004, p. 1927, fig. 27.8:14
Lachish	92	5b-1?	31801/66	Gottlieb 2004, p. 1915, fig. 27.2:2
Lachish	165	5b-1?	61744/60	Gottlieb 2004, p. 1923, fig. 27.6:4
Carchemish	32	5b-1?	Pl. 22,4	Wooley 1921, Pl. 23,4

Type 5b-1 (continued)



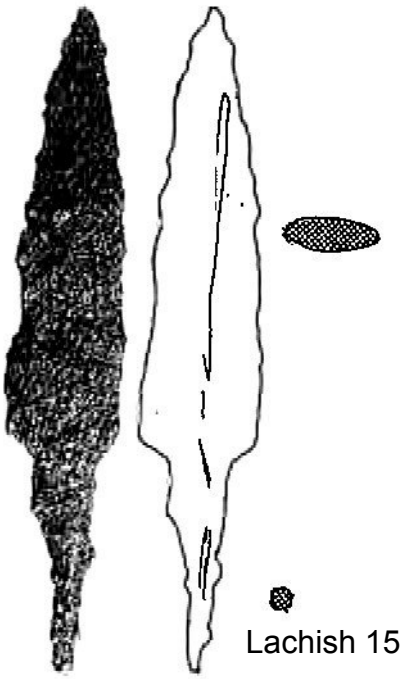
Lachish 67

Nimrud 15



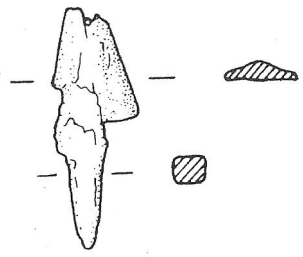
Nush-i Jan 4

Type 5b-2



Lachish 151

Type 5b-4



Nush-i Jan 2

Sources:

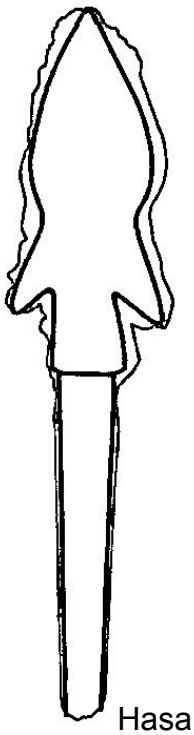
Site	No.	Type	Item No.	Source
Lachish	67	5b-1?	425/60	Rothenberg 1975, p. 74, pl. 36:3
Nimrud	15	5b-1?	ND 10944	British Museum
Nush-i Jan	4	5b-1?	NU 70/402	Curtis 1984, p. 26, fig 6:251
Lachish	151	5b-2	61478/60	Gottlieb 2004, p. 1921, fig. 27.5:9
Nush-i Jan	2	5b-4?	NU 77/54	Curtis 1984, p. 26, fig 6:249

Plate 181

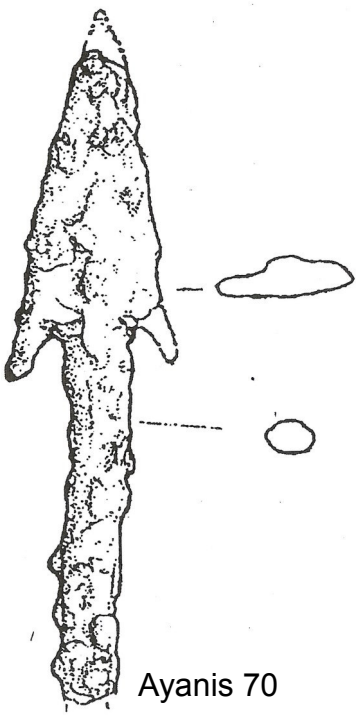
Type 5b-5

Hasanlu 41

Fakharyia 12

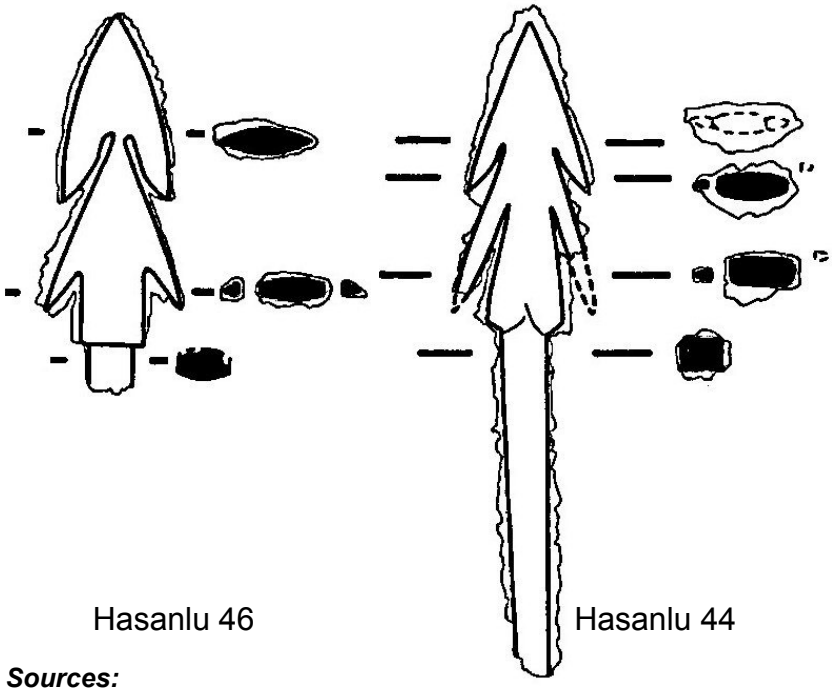


Hasanlu 43



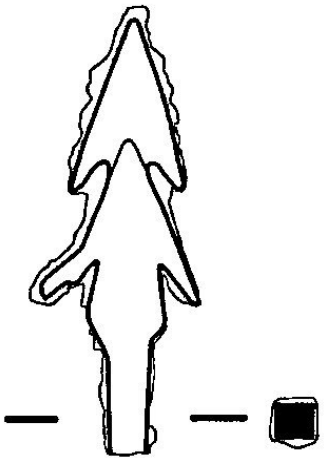
Ayanis 70

Type 5b-6



Hasanlu 46

Hasanlu 44



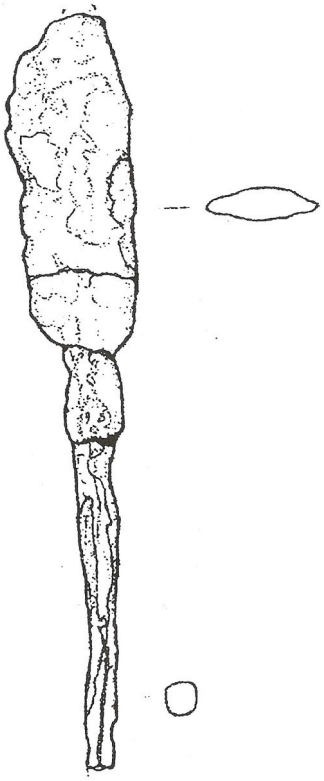
Hasanlu 45

Sources:

Site	No.	Type	Item No.	Source
Hasanlu	41	5b-5	HAS 74-437	Thornton & Pigott 2011, p. 144, fig. 6.5:2
Fakhariya	12	5b-5	F237l	McEwan et al 1957, p. 46, pl. 45:13
Hasanlu	43	5b-5	HAS 70-190	Thornton & Pigott 2011, p. 144, fig. 6.5:4
Ayanis	70	5b-5?	70	Derın & Muscarella 2001, fig. 5
Hasanlu	46	5b-6	HAS 60-33	Thornton & Pigott 2011, p. 144, fig. 6.5:7
Hasanlu	44	5b-6	HAS 62-991	Thornton & Pigott 2011, p. 144, fig. 6.5:5
Hasanlu	45	5b-6?	HAS 60-102	Thornton & Pigott 2011, p. 144, fig. 6.5:6

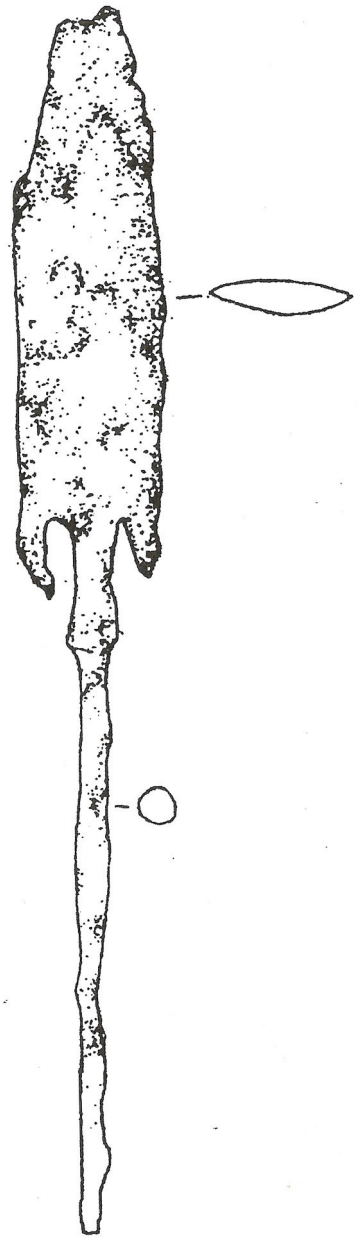
Plate 182

Type 5b-10



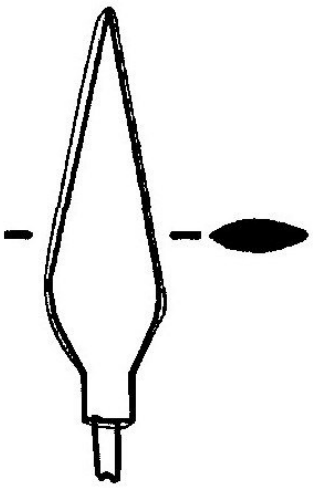
Ayanis 28

Type 5b-14



Ayanis 69

Type 5b-19



Hasanlu 14

Type 5b-21

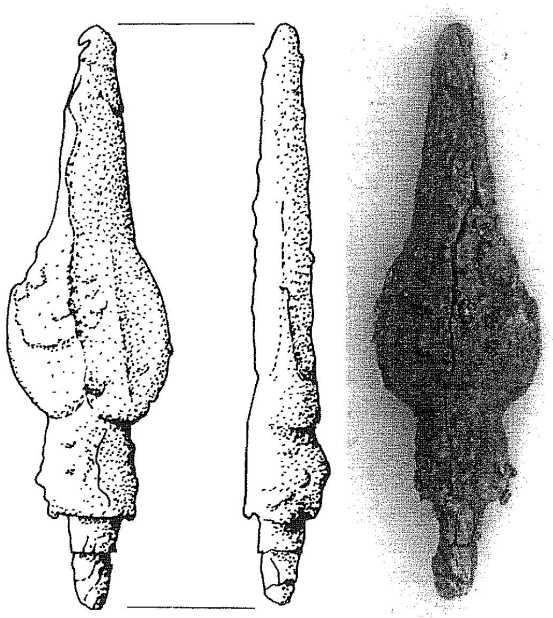
Gerar 75

Sources:

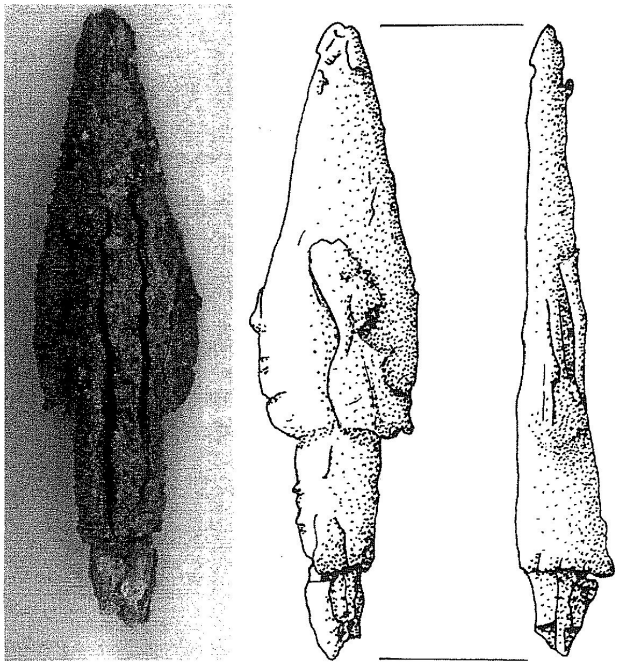
Site	No.	Type	Item No.	Source
Ayanis	28	5b-10?	28	Derın & Muscarella 2001, fig. 3
Ayanis	69	5b-14	69	Derın & Muscarella 2001, fig. 5
Hasanlu	14	5b-19	HAS 74-326	Thornton & Pigott 2011, p. 141, fig. 6.2:14
Gerar	75	5b-21!	pl. 29:60	Petrie 1928, pl. 29:60

Plate 183

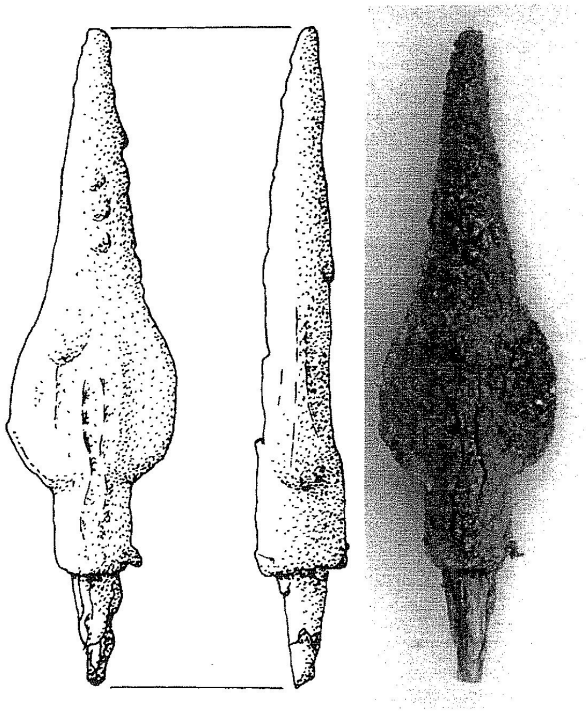
Type 5b-37



Knedig 10



Knedig 12



Knedig 11

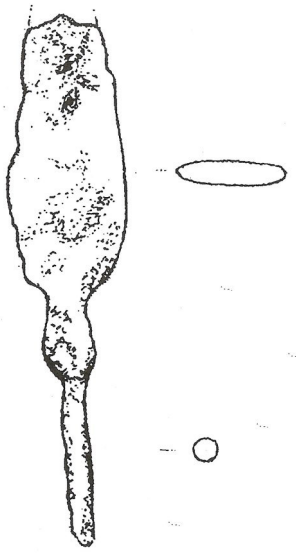
Carchemish 28

Sources:

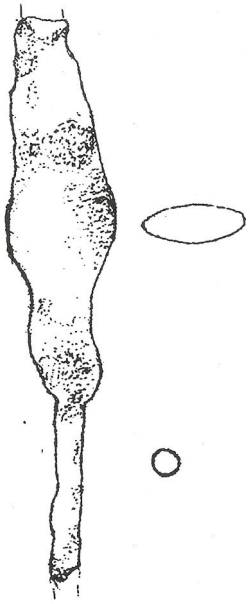
Site	No.	Type	Item No.	Source
Tell Knedig	10	5b-37	1120	Klengel-Brandt et al 2005, p. 306, pl. 201
Tell Knedig	12	5b-37	1122	Klengel-Brandt et al 2005, p. 306, pl. 201
Tell Knedig	11	5b-37	1121	Klengel-Brandt et al 2005, p. 306, pl. 201
Carchemish	28	5b-37?	116219	British Museum, 1922-5-11.352

Plate 184

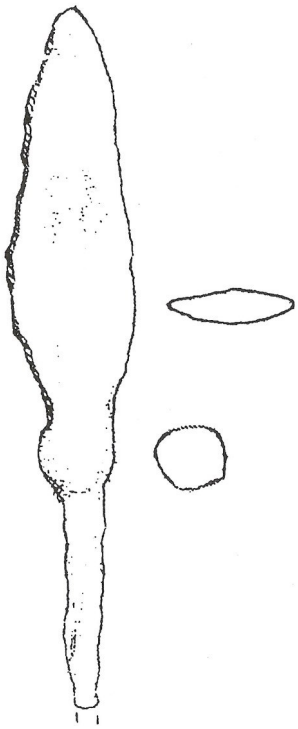
Type 5c-1



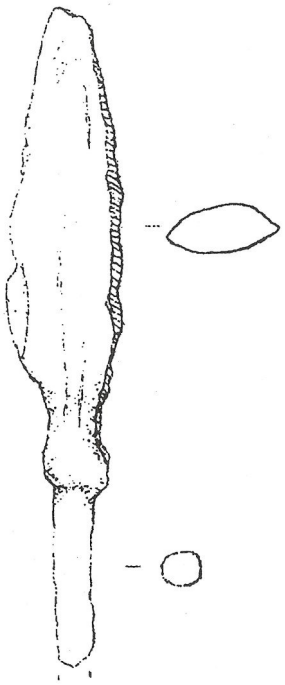
Ayanis 33



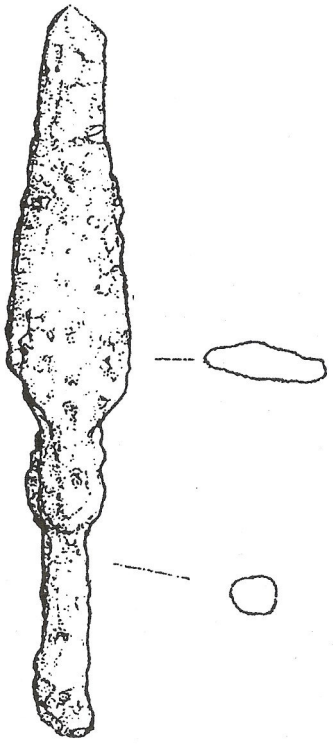
Ayanis 32



Ayanis 25



Ayanis 24



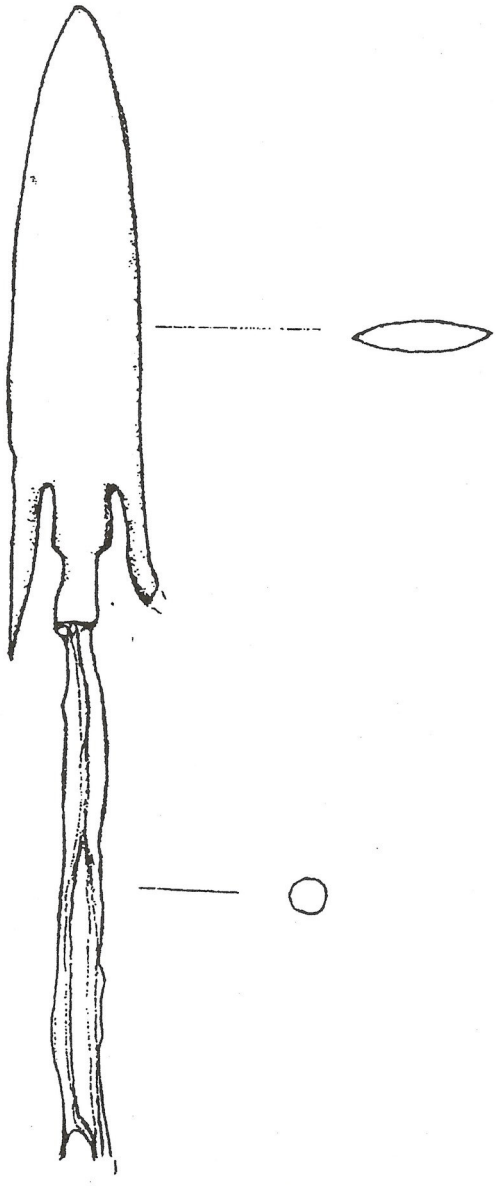
Ayanis 39

Sources:

Site	No.	Type	Item No.	Source
Ayanis	33	5c-1	33	Derın & Muscarella 2001, fig. 3
Ayanis	32	5c-1	32	Derın & Muscarella 2001, fig. 3
Ayanis	25	5c-1	25	Derın & Muscarella 2001, fig. 3
Ayanis	24	5c-1	24	Derın & Muscarella 2001, fig. 3
Ayanis	39	5c-1	39	Derın & Muscarella 2001, fig. 3

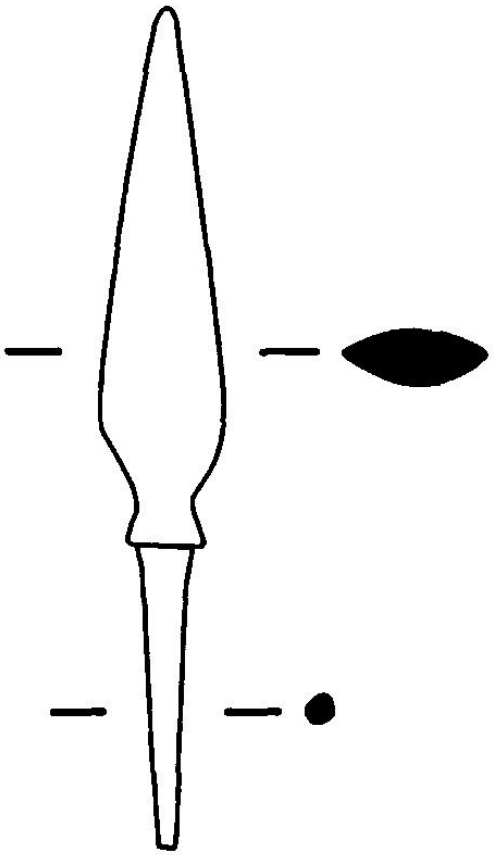
Plate 185

Type 5d-14



Ayanis 90

Type 5e-1



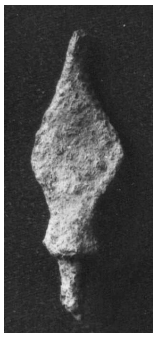
Hasanlu 18

Sources:

Site	No.	Type	Item No.	Source
Ayanis	90	5d-14	90	Derın & Muscarella 2001, fig. 6
Hasanlu	18	5e-1	HAS 74-276	Thornton & Pigott 2011, p. 142, fig. 6.3:1

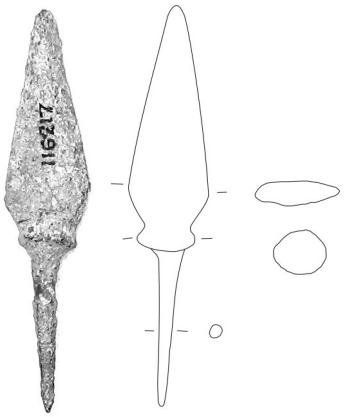
Plate 186

Type 5e-20



Assur 59

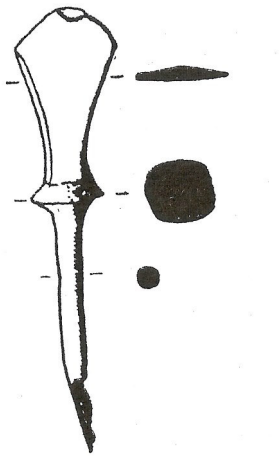
Assur 60



Carchemish 26

Carchemish 25

Type 5e-57



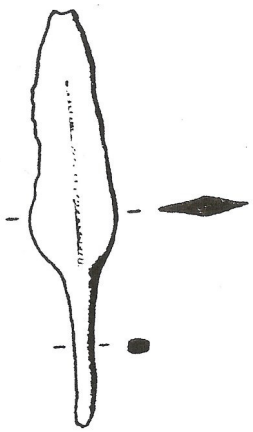
Toprakkale 17

Sources:

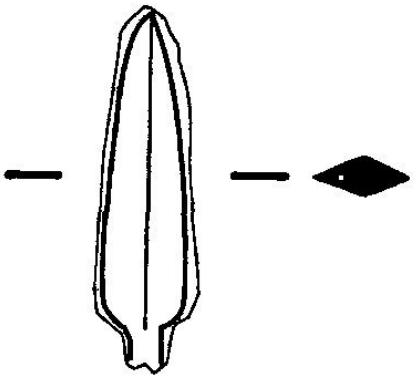
Site	No.	Type	Item No.	Source
Assur	59	5e-20	20676	Vorderasiatisches Museum Berlin
Assur	60	5e-20	12678	Vorderasiatisches Museum Berlin
Carchemish	26	5e-20	116217	British Museum, 1922-5-11.350
Carchemish	25	5e-20	116216	British Museum, 1922-5-11.349
Toprakkale	17	5e-57	337	Wartke 1990, p. 127, fig. 32l; pl. 39:b.6

Plate 187

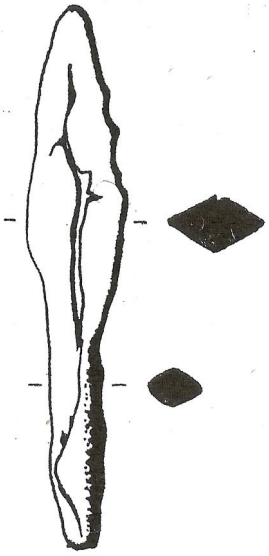
Type 5f-1



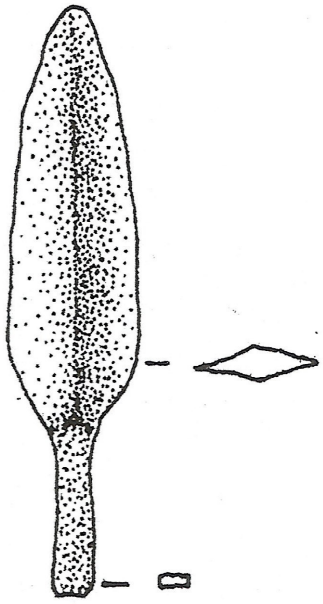
Toprakkale 12



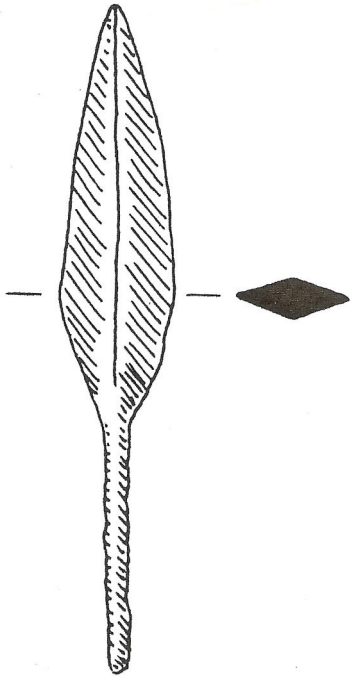
Hasanlu 13



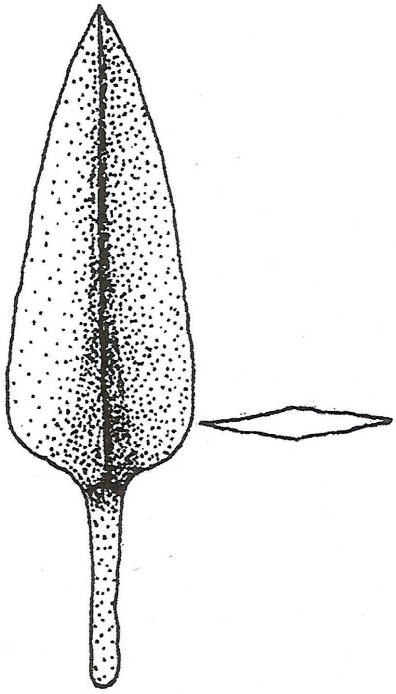
Toprakkale 14



Marlik 37



Bastam 11

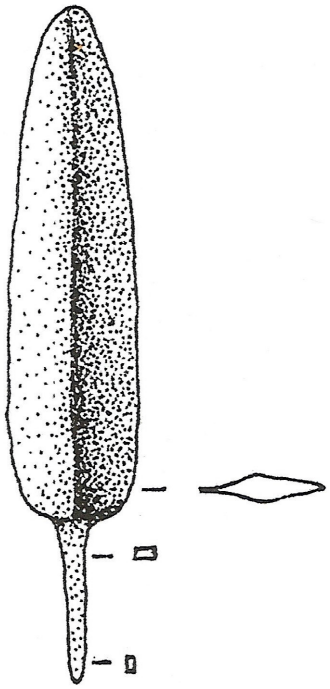


Marlik 33

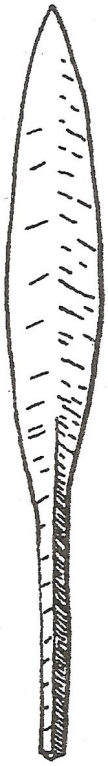
Sources:

Site	No.	Type	Item No.	Source
Toprakkale	12	5f-1	332	Wartke 1990, p. 127, fig. 32g
Hasanlu	13	5f-1	HAS 64-480 c	Thornton & Pigott 2011, p. 141, fig. 6.2:13
Toprakkale	14	5f-1!	334	Wartke 1990, p. 127, fig. 32h; pl. 39:b.5
Marlik	37	5f-1	1527 M	Negahban 1995, p. 87, fig. 76
Bastam	11	5f-1	74/15	Kroll 1979, p. 164; Abb 16:1
Marlik	33	5f-1	41g M	Negahban 1995, p. 87, fig. 72

Type 5f-1 (continued)



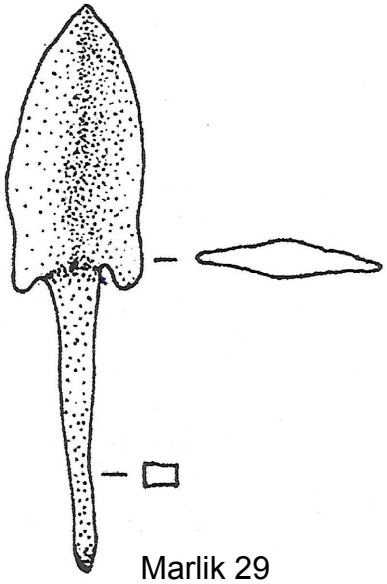
Marlik 35



Carchemish 39
(not to scale)

Sialk 38

Type 5f-5

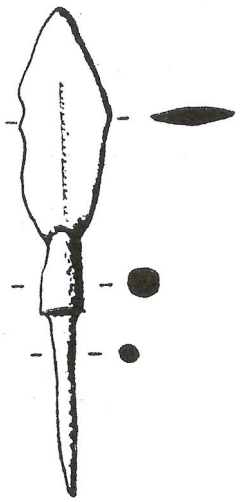


Marlik 29

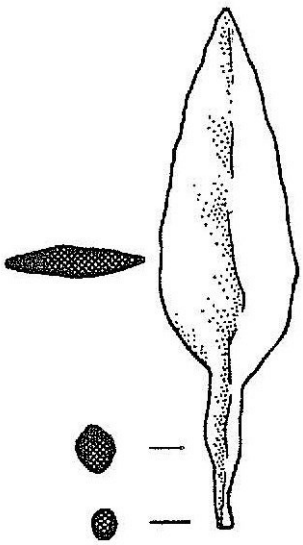
Sources:

Site	No.	Type	Item No.	Source
Marlik	35	5f-1	1526 M	Negahban 1995, p. 87, fig. 74
Carchemish	39	5f-1	Fig. 20,b	Wooley 1921, Fig. 20,b
Sialk	38	5f-1?	S 892e, b	Ghirshman 1939, vol. 2, p. 242, pl. 71
Marlik	29	5f-5	328e M	Negahban 1995, p. 86, fig. 68

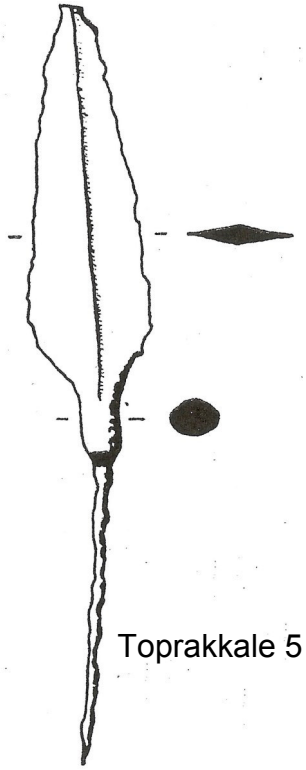
Type 5g-1



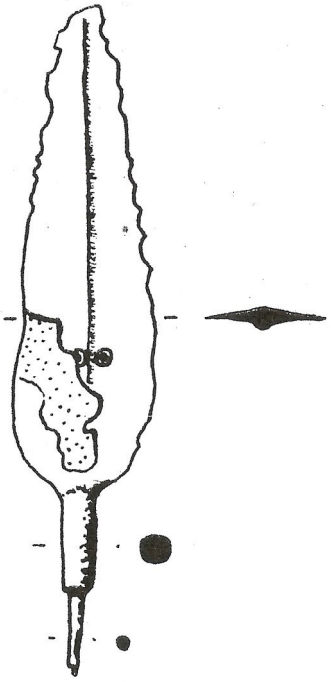
Toprakkale 10



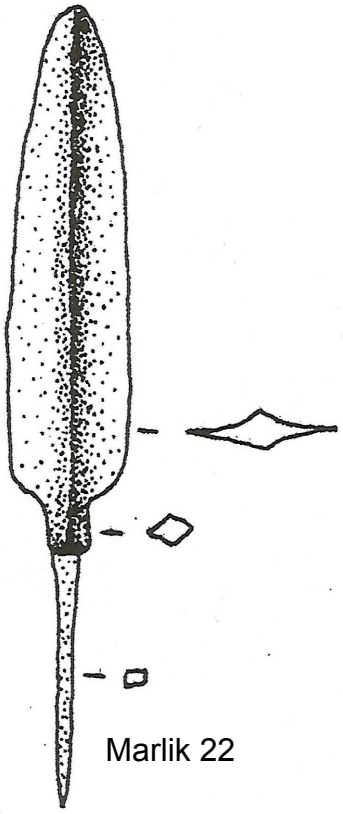
Lachish 70



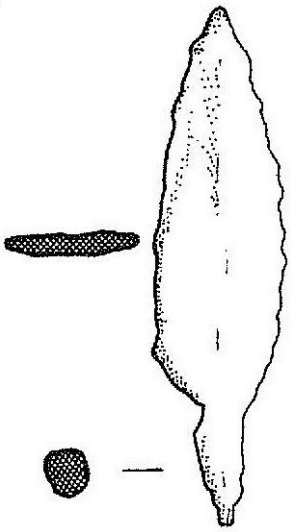
Toprakkale 5



Toprakkale 6



Marlik 22

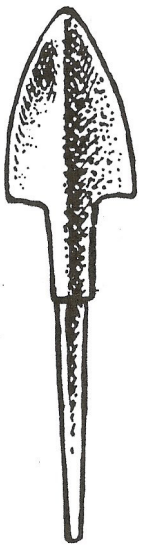


Lachish 71

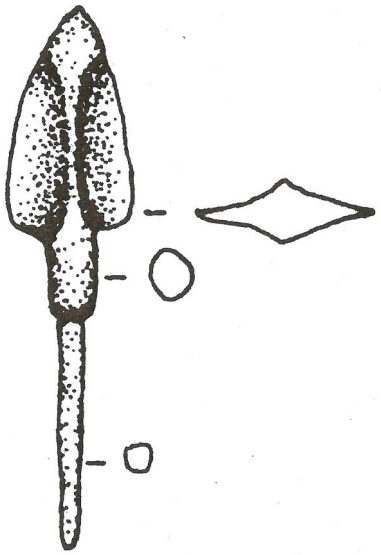
Sources:

Site	No.	Type	Item No.	Source
Toprakkale	10	5g-1	320	Wartke 1990, p. 127, fig. 32e
Lachish	70	5g-1	256/61	Rothenberg 1975, p. 75, pl. 29:3 & 36:6
Toprakkale	5	5g-1	264	Wartke 1990, p. 127, fig. 32a; pl. 39:b.1
Toprakkale	6	5g-1	290	Wartke 1990, p. 127, fig. 32b
Marlik	22	5g-1	328d M	Negahban 1995, p. 83, fig. 64
Lachish	71	5g-1?	913/60	Rothenberg 1975, p. 75, pl. 29:2 & 36:7

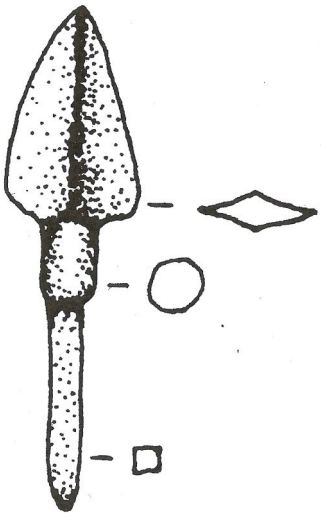
Type 5g-4



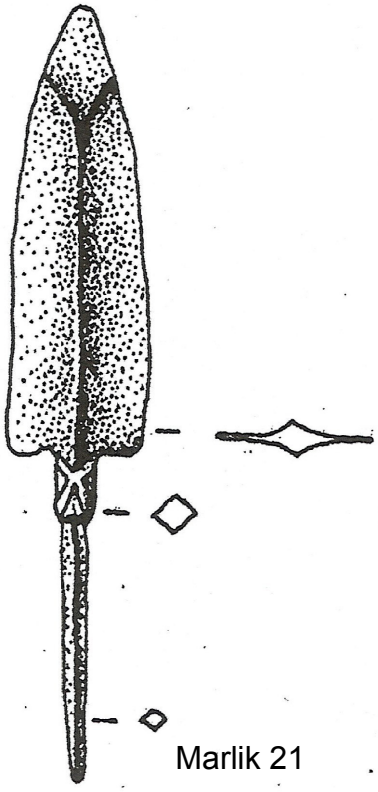
Marlik 16



Marlik 15



Marlik 14

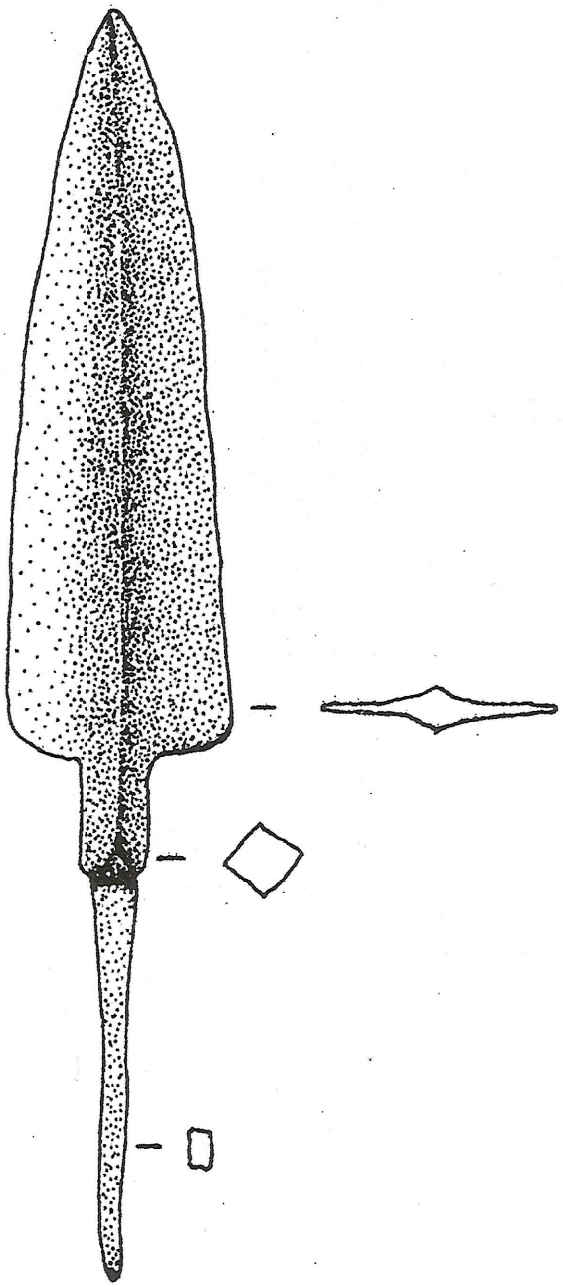


Marlik 21

Sources:

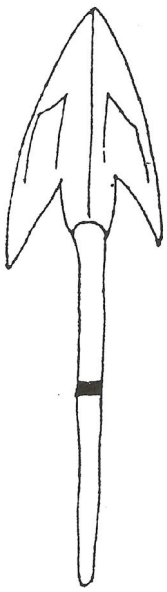
Site	No.	Type	Item No.	Source
Marlik	16	5g-4	112b M	Negahban 1995, p. 82, fig. 62
Marlik	15	5g-4	1181a M	Negahban 1995, p. 82, fig. 61
Marlik	14	5g-4	328b M	Negahban 1995, p. 82, fig. 60
Marlik	21	5g-4	328c M	Negahban 1995, p. 82, fig. 63

Type 5g-4 (continued)



Marlik 24

Type 5g-5



Karchaghbyur 4

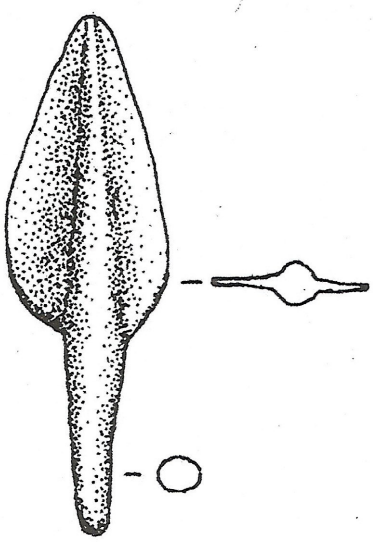
Sources:

Site	No.	Type	Item No.	Source
Marlik	24	5g-4	1181c M	Negahban 1995, p. 83, fig. 66
Karchaghbyur	4	5g-5	pl. 14:1	Yengibaryan 2002, p. 423; pl. 14:1

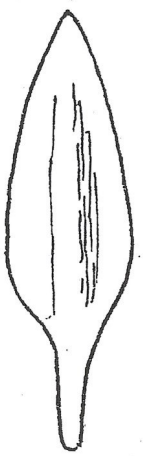
Plate 192

Type 5p-1

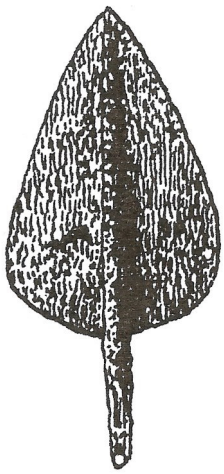
Gerar 65



Marlik 38

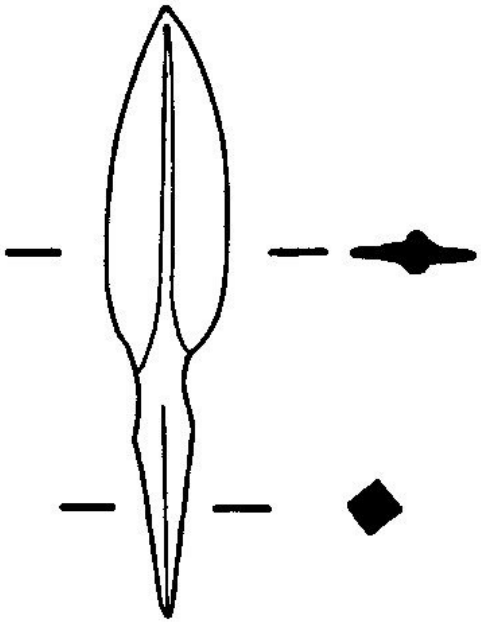


Gerar 51



Sialk 78

Gerar 2



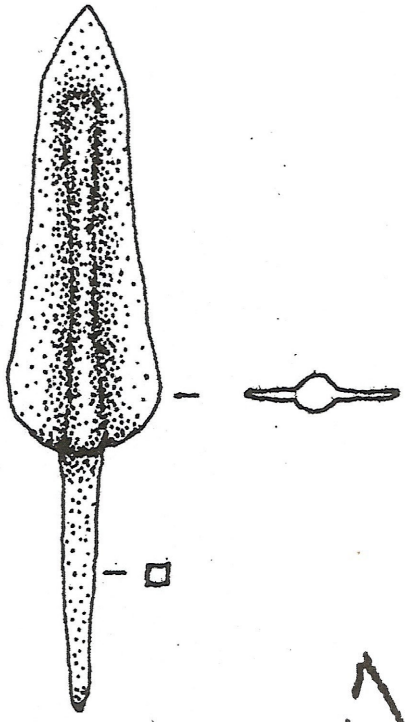
Hasanlu 55

Gerar 4

Sources:

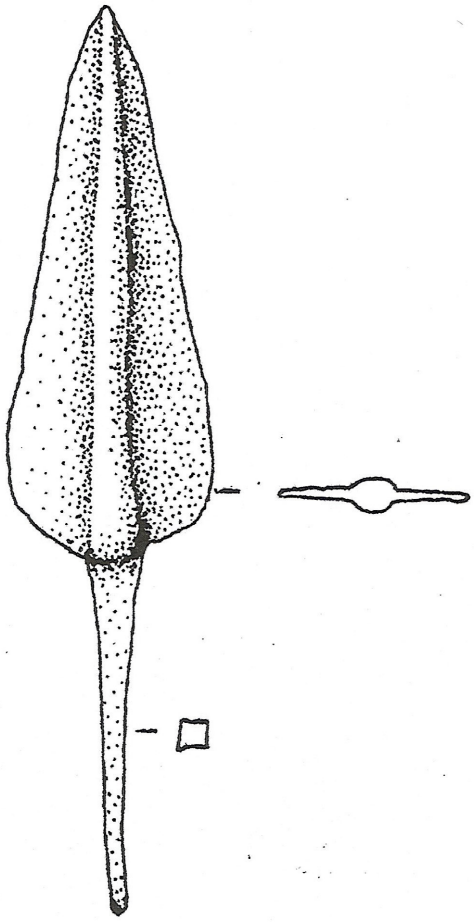
Site	No.	Type	Item No.	Source
Gerar	65	5p-1	pl. 29:50	Petrie 1928, pl. 29:50
Marlik	38	5p-1	41h M	Negahban 1995, p. 87, fig. 77
Gerar	51	5p-1	pl. 29:36	Petrie 1928, pl. 29:36
Sialk	78	5p-1	pl. 92:22	Ghirshman 1939, vol. 2, p. 248, pl. 92
Gerar	2	5p-1	pl. 23:26	Petrie 1928, pl. 23:26
Hasanlu	55	5p-1!	HAS 60-709	Thornton & Pigott 2011, p. 145, fig. 6.6:8
Gerar	4	5p-1	pl. 23:29	Petrie 1928, pl. 23:29

Type 5p-1 (continued)



Marlik 36

Sialk 45

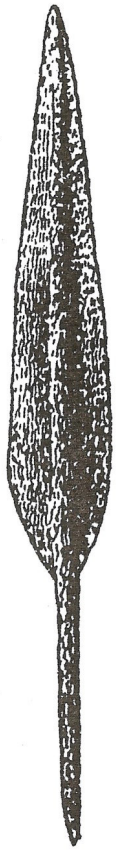


Marlik 34

Sources:

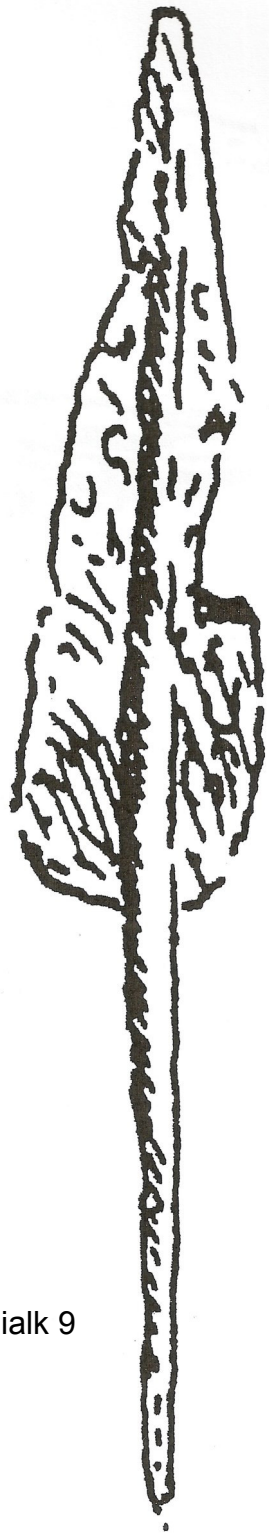
Site	No.	Type	Item No.	Source
Marlik	36	5p-1!	328f M	Negahban 1995, p. 87, fig. 75
Sialk	45	5p-1	S 923c, b	Ghirshman 1939, vol. 2, p. 244, pl. 75
Marlik	34	5p-1	402 M	Negahban 1995, p. 87, fig. 73

Type 5p-1 (continued)



Sialk 75

Sialk 50

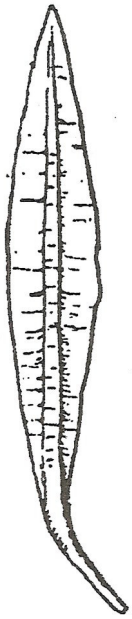


Sialk 9

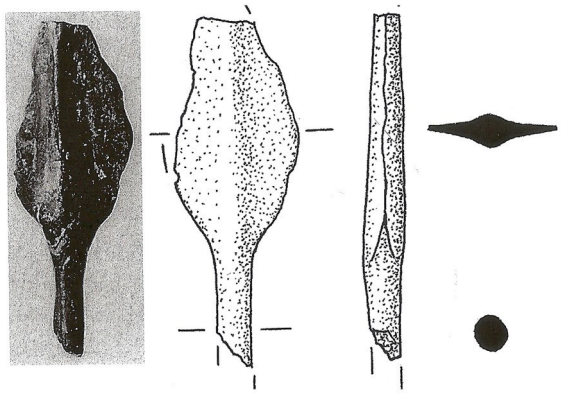
Sources:

Site	No.	Type	Item No.	Source
Sialk	75	5p-1	pl. 92:19	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	50	5p-1	S 923e, c	Ghirshman 1939, vol. 2, p. 244, pl. 75
Sialk	9	5p-1	S 547c, b	Ghirshman 1939, vol. 2, p. 229; pl. 50

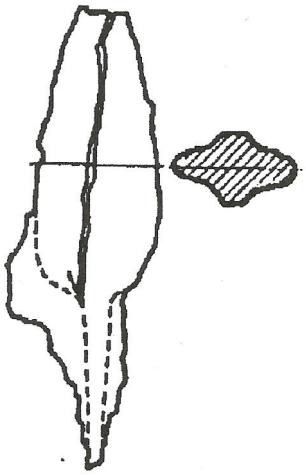
Type 5p-1 (continued)



Carchemish 38
(not to scale)

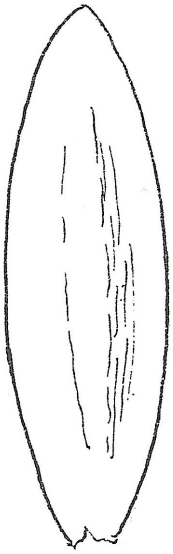


Uruk 25

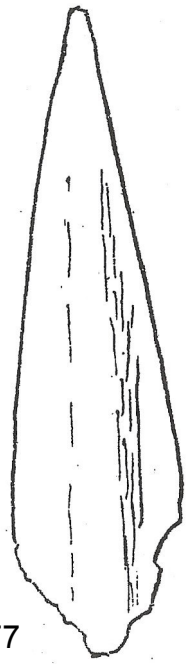


Nippur 2

Carchemish 24



Gerar 72



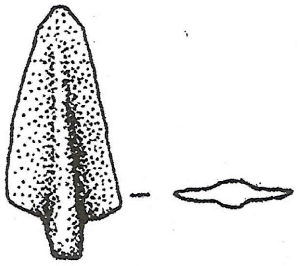
Gerar 77

Sources:

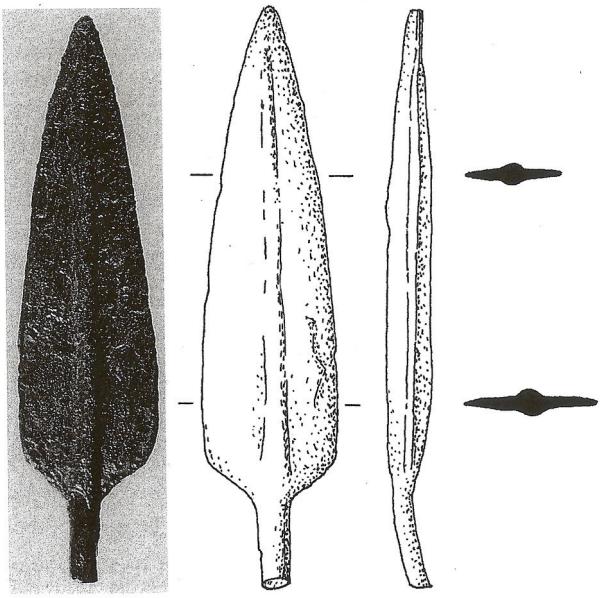
Site	No.	Type	Item No.	Source
Carchemish	38	5p-1	Fig. 20,a	Wooley 1921, Fig. 20,a
Uruk	25	5p-1	W 14855	Pedde 2000, p. 42, no. 668
Nippur	2	5p-1	2N 531	McCown 1967, p. 137, pl. 154:16
Carchemish	24	5p-1?	116215	British Museum; 1922-5-11.348(?)
Gerar	72	5p-1?	pl. 29:57	Petrie 1928, pl. 29:57
Gerar	77	5p-1?	pl. 29:62	Petrie 1928, pl. 29:62

Plate 196

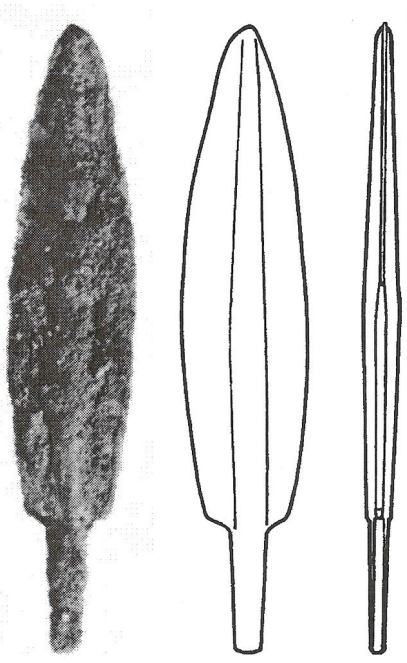
Type 5p-2



Marlik 39



Uruk 22



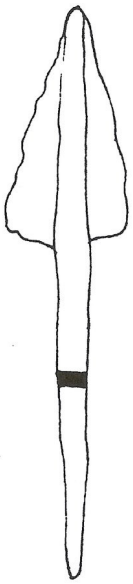
Fakhariya 14

Sources:

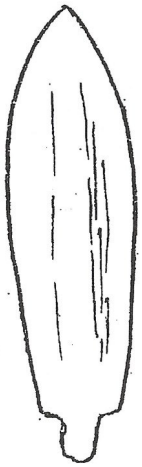
Site	No.	Type	Item No.	Source
Marlik	39	5p-2	951b M	Negahban 1995, p. 87, fig. 78
Uruk	22	5p-2	W 4232	Pedde 2000, p. 42, no. 665
Fakhariya	14	5p-2	F450	McEwan et al 1957, p. 49-50, pl. 49:4 & 52:19

Plate 197

Type 5p-4



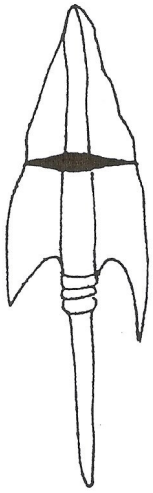
Karchaghbyur 2



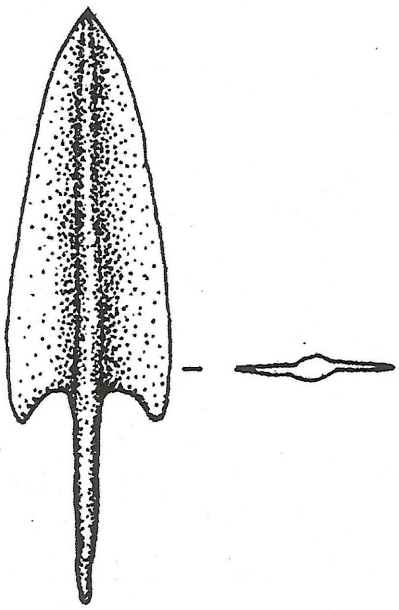
Gerar 66

Gerar 76

Type 5p-5



Karchaghbyur 8

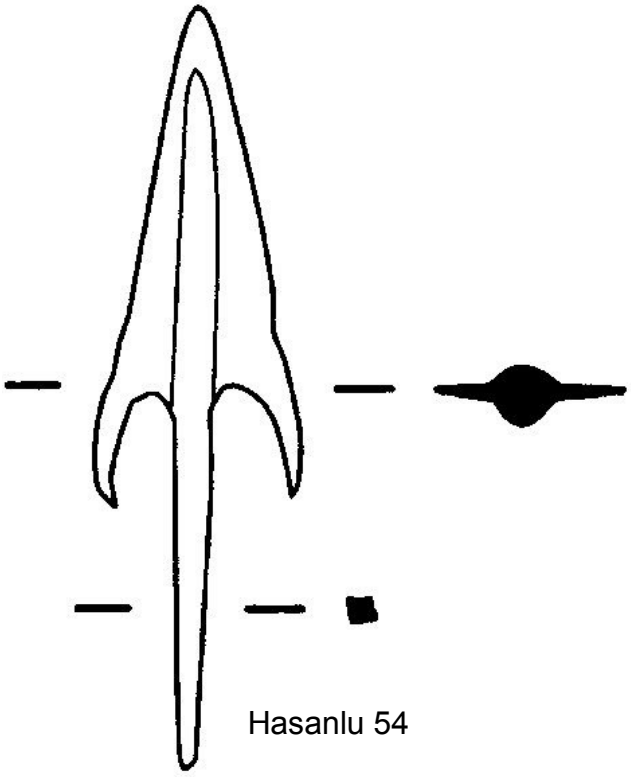


Marlik 28

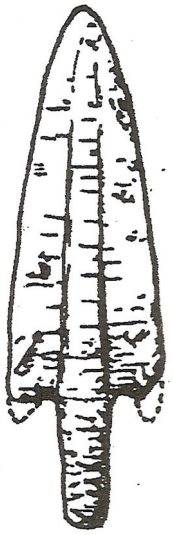
Sources:

Site	No.	Type	Item No.	Source
Karchaghbyur	2	5p-4	pl. 5:5	Yengibaryan 2002, p. 420, pl. 5:5
Gerar	66	5p-4	pl. 29:51	Petrie 1928, pl. 29:51
Gerar	76	5p-4	pl. 29:61	Petrie 1928, pl. 29:61
Karchaghbyur	8	5p-5	pl. 16:4	Yengibaryan 2002, p. 423, pl. 16:4
Marlik	28	5p-5	237b M	Negahban 1995, p. 86, fig. 67

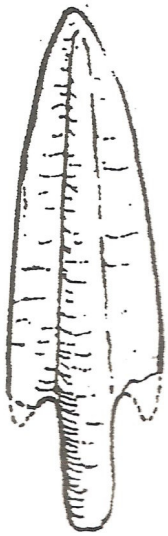
Type 5p-5 (continued)



Hasanlu 54

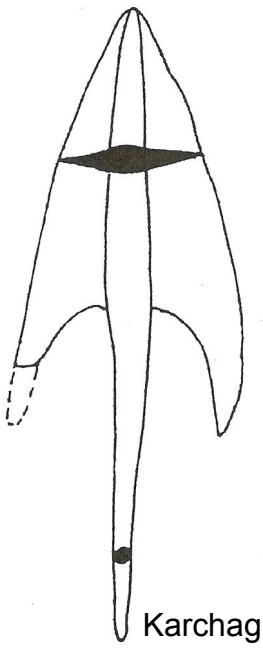


Carchemish 42
(not to scale)



Carchemish 43
(not to scale)

Type 5p-7



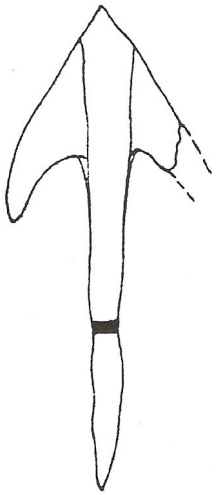
Karchaghbyur 5

Marlik 5

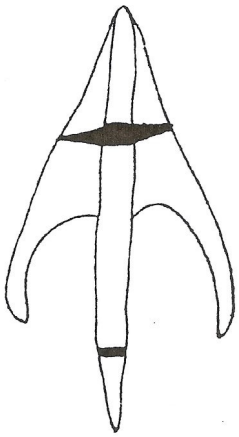
Sources:

Site	No.	Type	Item No.	Source
Hasanlu	54	5p-5	HAS 74-269	Thornton & Pigott 2011, p. 145, fig. 6.6:7
Carchemish	42	5p-5	Fig. 20,e	Wooley 1921, Fig. 20,e
Carchemish	43	5p-5	Fig. 20,f	Wooley 1921, Fig. 20,f
Karchaghbyur	5	5p-7	pl. 16:1	Yengibaryan 2002, p. 423, pl. 16:1
Marlik	5	5p-7	41c M	Negahban 1996, p. 277, pl. 126:828

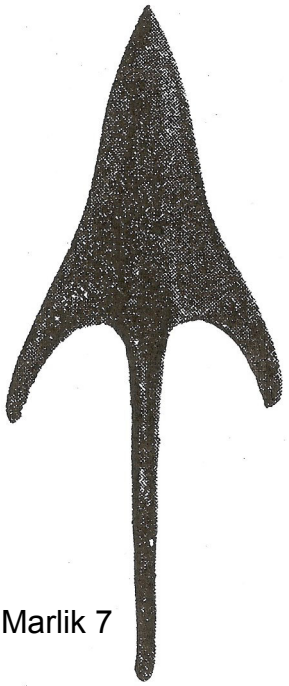
Type 5p-8



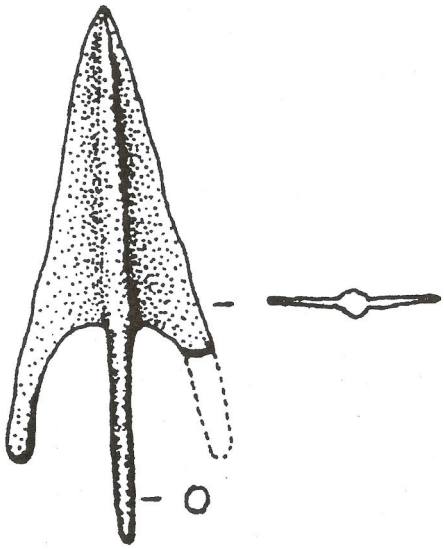
Karchaghbyur 1



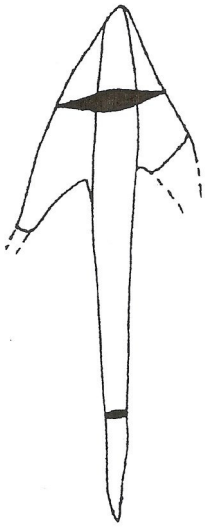
Karchaghbyur 7



Marlik 7



Marlik 6



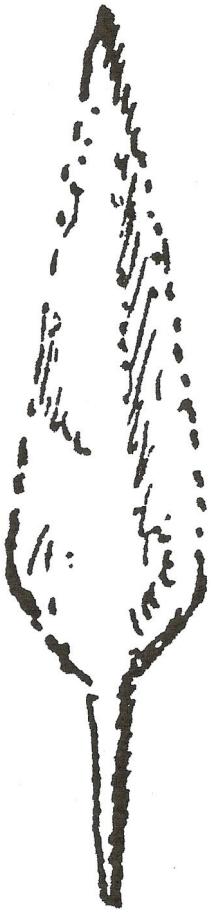
Karchaghbyur 6

Sources:

Site	No.	Type	Item No.	Source
Karchaghbyur	1	5p-8	pl. 5:4	Yengibaryan 2002, p. 420, pl. 5:4
Karchaghbyur	7	5p-8	pl. 16:3	Yengibaryan 2002, p. 423, pl. 16:3
Marlik	7	5p-8	41d M	Negahban 1996, p. 277, pl. 126:830
Marlik	6	5p-8	328a M	Negahban 1995, p. 81, fig. 54
Karchaghbyur	6	5p-8	pl. 16:2	Yengibaryan 2002, p. 423, pl. 16:2

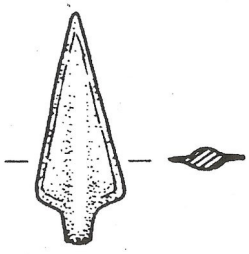
Type 5p-19

Sialk 17



Sialk 20

Type 5p-20



Nush-i Jan 8

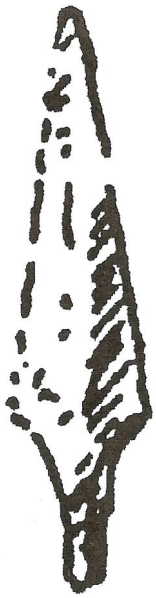
Sources:

Site	No.	Type	Item No.	Source
Sialk	17	5p-19?	S 793a, a	Ghirshman 1939, vol. 2, p, 233, pl. 57
Sialk	20	5p-19?	S 793a, d	Ghirshman 1939, vol. 2, p, 233, pl. 57
Nush-i Jan	8	5p-20	NU 73/36	Curtis 1984, p. 27, fig 6:255

Type 5p-20 (continued)

Sialk 41

Sialk 33



Sialk 32

Sialk 19

Sources:

Site	No.	Type	Item No.	Source
Sialk	41	5p-20	S 919a	Ghirshman 1939, vol. 2, p. 243, pl. 75
Sialk	33	5p-20?	S 764, d	Ghirshman 1939, vol. 2, p. 235, pl. 62
Sialk	32	5p-20?	S 764, c	Ghirshman 1939, vol. 2, p. 235, pl. 62
Sialk	19	5p-20?	S 793a, c	Ghirshman 1939, vol. 2, p, 233, pl. 57

Type 5p-20 (continued)

Sialk 21

Sialk 49

Sources:

Site	No.	Type	Item No.	Source
Sialk	21	5p-20?	S 793a, e	Ghirshman 1939, vol. 2, p, 233, pl. 57
Sialk	49	5p-20?	S 923e, b	Ghirshman 1939, vol. 2, p. 244, pl. 75

Sources for Plate 203:

Sialk	43	5p-22	S 923b	Ghirshman 1939, vol. 2, p. 244, pl. 75
Sialk	42	5p-23	S 923a	Ghirshman 1939, vol. 2, p. 244, pl. 75
Carchemish	37	5p-39	Pl. 22,13	Wooley 1921, Pl. 23,13
Carchemish	41	5p-39	Fig. 20,d	Wooley 1921, Fig. 20,d

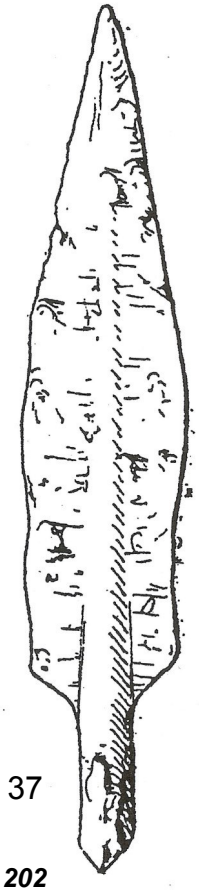
Type 5p-22

Sialk 43

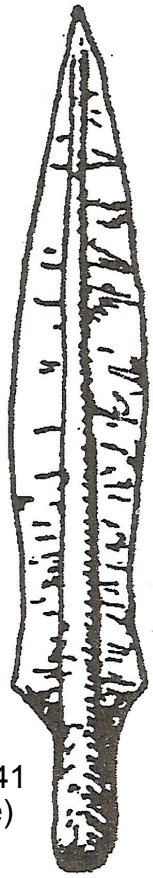
Type 5p-23

Sialk 42

Type 5p-39



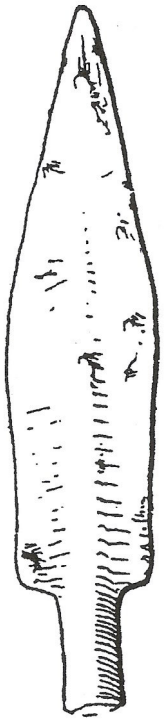
Carchemish 37



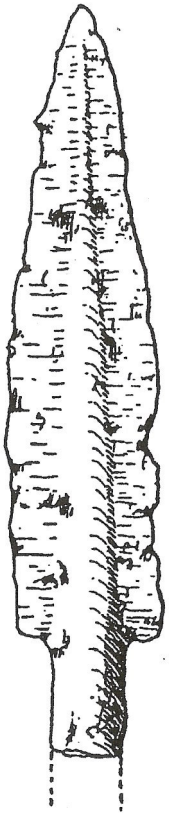
Carchemish 41
(not to scale)

Sources: see Plate 202

Type 5p-41

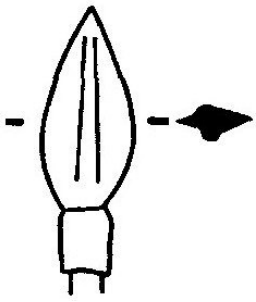


Carchemish 35

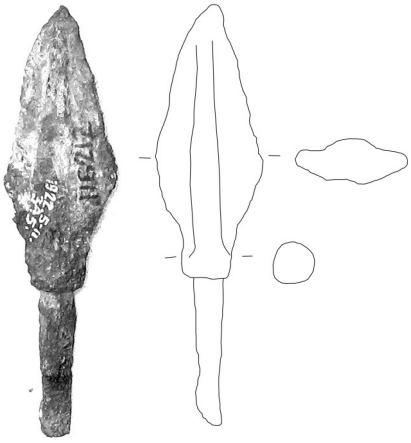


Carchemish 31

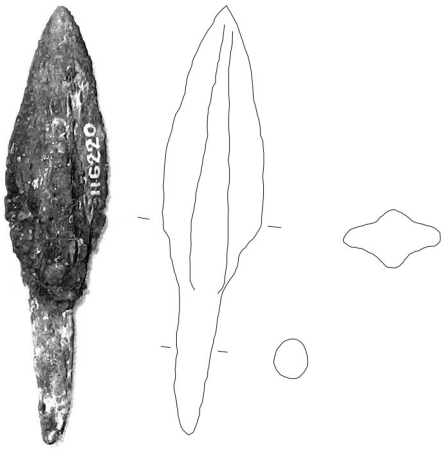
Type 5q-1



Hasanlu 34



Carchemish 21

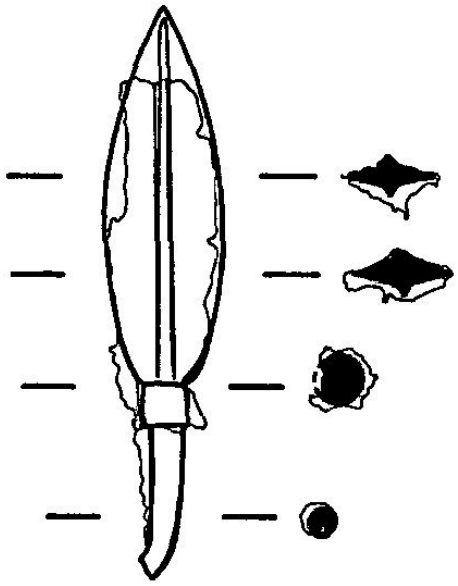


Carchemish 29

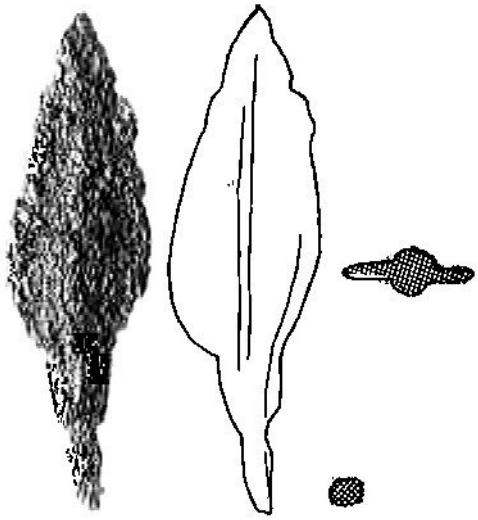
Sources: see Plate 205

Plate 205

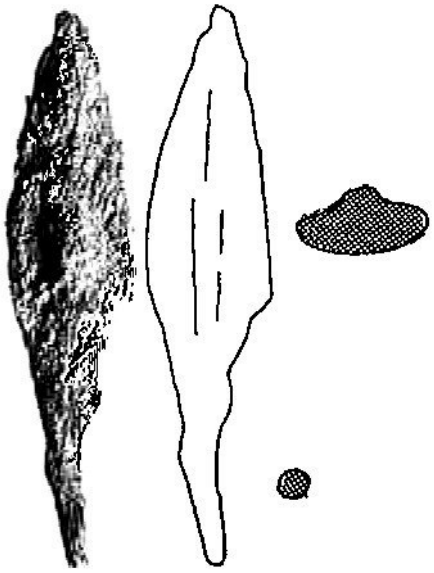
Type 5q-1 (continued)



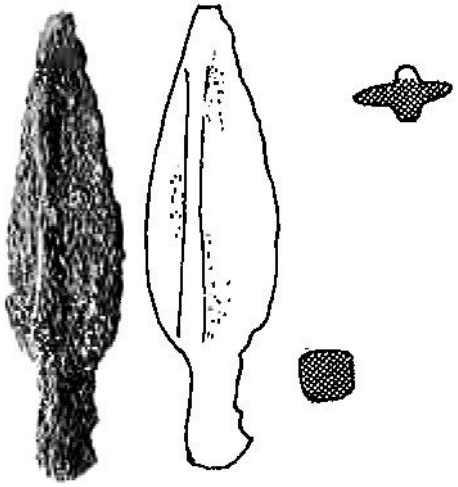
Hasanlu 22



Lachish 119



Lachish 365



Lachish 120

Sources for Plate 204:

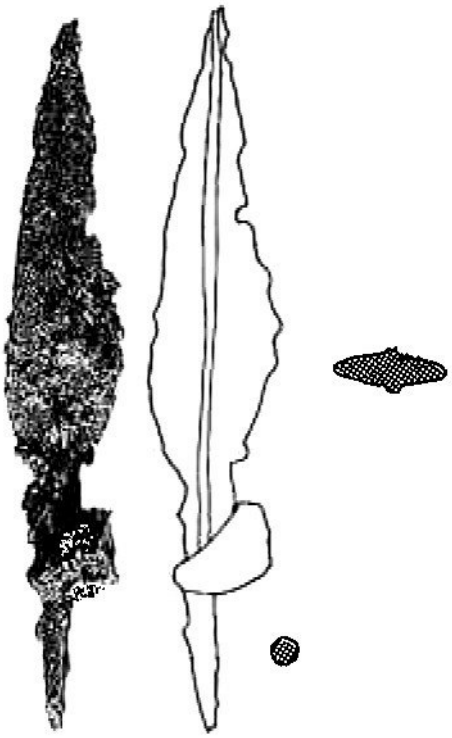
Site	No.	Type	Item No.	Source
Carchemish	35	5p-41	Pl. 22,7	Wooley 1921, Pl. 23,7
Carchemish	31	5p-41	Pl. 22,3	Wooley 1921, Pl. 23,3
Hasanlu	34	5q-1	HAS 74-427 c	Thornton & Pigott 2011, p. 142, fig. 6.3:17
Carchemish	21	5q-1	116212	British Museum, 1922-5-11.345
Carchemish	29	5q-1	116220	British Museum, 1922-5-11.353

Sources for Plate 205:

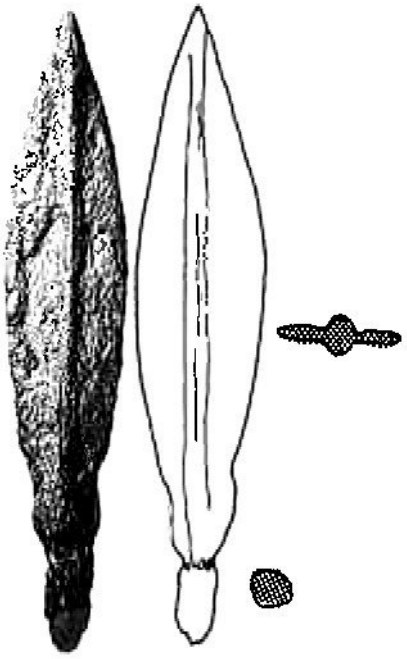
Hasanlu	22	5q-1	HAS 70-645	Thornton & Pigott 2011, p. 142, fig. 6.3:5
Lachish	119	5q-1	31546/60	Gottlieb 2004, p. 1917, fig. 27.3:13
Lachish	365	5q-1	7140	Gottlieb 2004, p. 1949, fig. 27.19:1
Lachish	120	5q-1	38671/60	Gottlieb 2004, p. 1917, fig. 27.3:14

Type 5q-1 (continued)

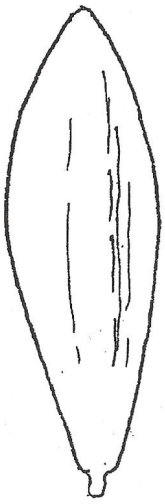
Nimrud 233 Nimrud 234



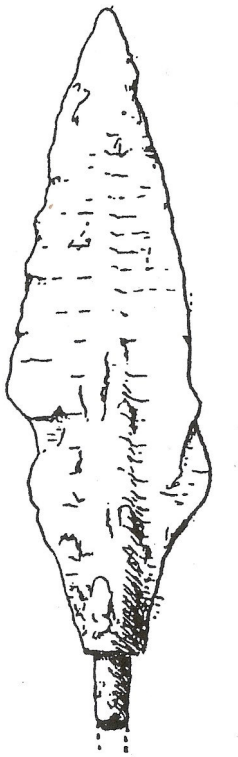
Lachish 149



Lachish 81



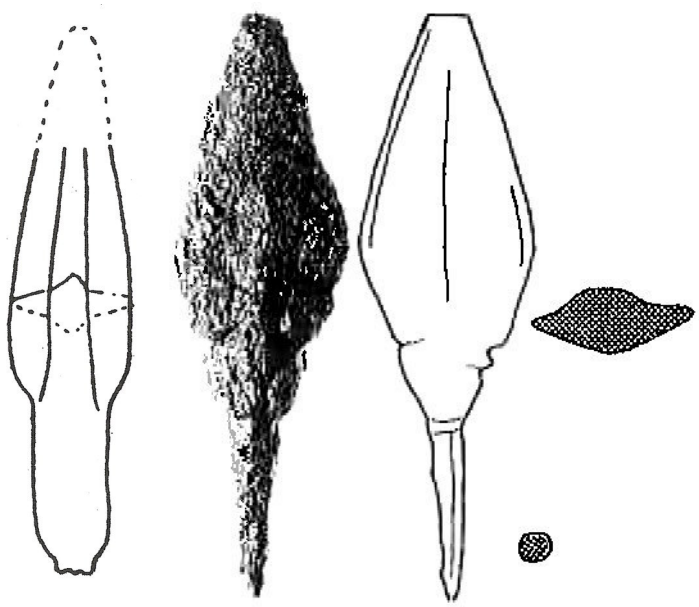
Gerar 67



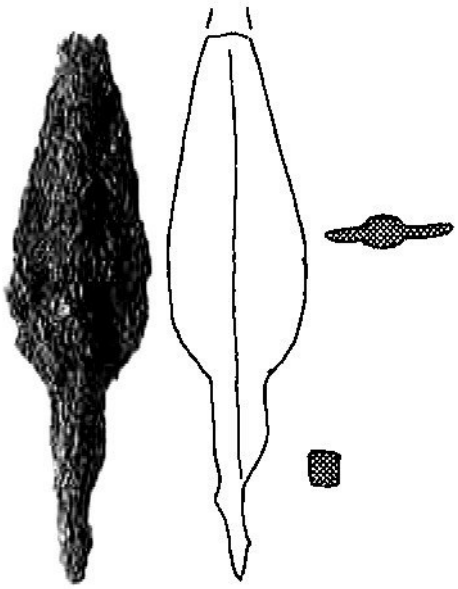
Carchemish 33

Sources: see Plate 207

Type 5q-1 (continued)

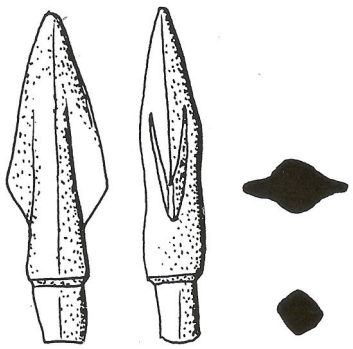


Lachish 25 Lachish 117



Lachish 118

Type 5q-2



Uruk 14

Type 5q-3

Assur 3

Sources for Plate 206:

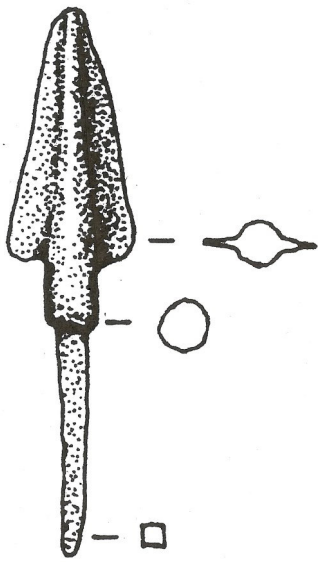
Site	No.	Type	Item No.	Source
Nimrud	233	5q-1	ND 10944	British Museum
Nimrud	234	5q-1	ND 10944	British Museum
Lachish	149	5q-1	62203/60	Gottlieb 2004, p. 1921, fig. 27.5:7
Lachish	81	5q-1	40999/60	Gottlieb 2004, p. 1911, fig. 27.1:7
Gerar	67	5q-1!	pl. 29:52	Petrie 1928, pl. 29:52
Carchemish	33	5q-1	Pl. 22,5	Wooley 1921, Pl. 23,5

Sources for Plate 207:

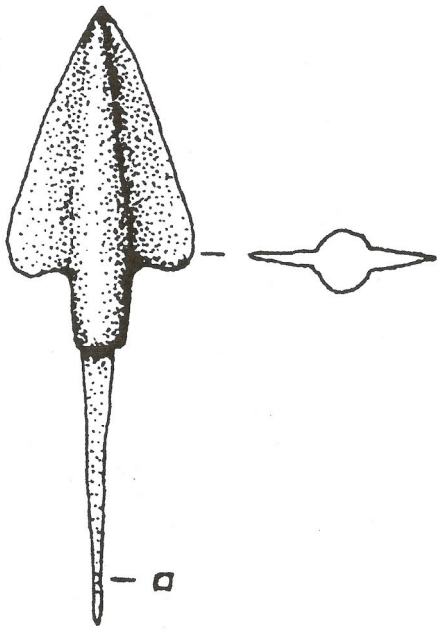
Lachish	25	5q-1	Pl. 60,13	Tufnell et al 1953, p. 111, pl. 60:13
Lachish	117	5q-1	31534/60	Gottlieb 2004, p. 1917, fig. 27.3:11
Lachish	118	5q-1	38867/60	Gottlieb 2004, p. 1917, fig. 27.3:12
Uruk	14	5q-2!	W 18184	van Ess & Pedde 1992, p. 37, no. 354
Assur	3	5q-3	14025	Haller 1954, p. 23

Plate 208

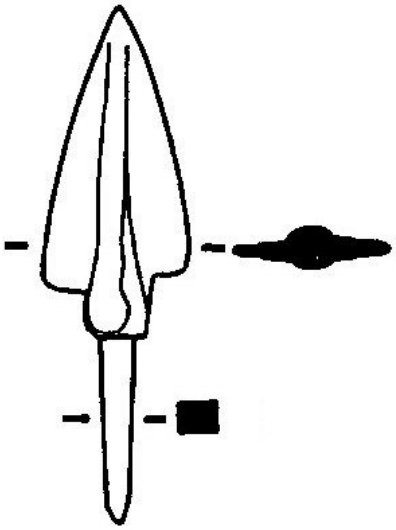
Type 5q-4



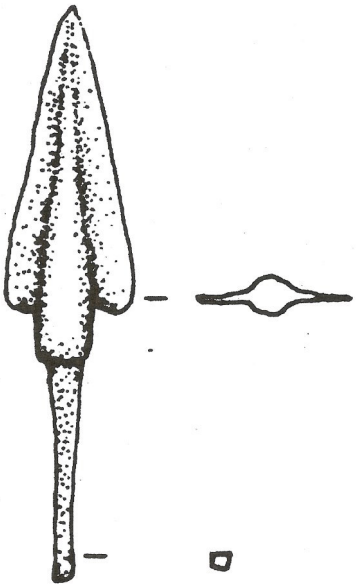
Marlik 12



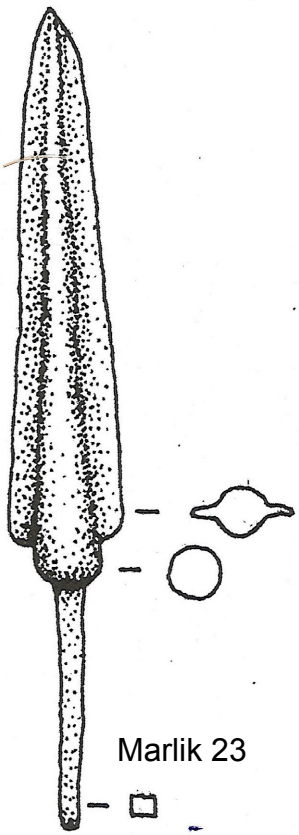
Marlik 11



Hasanlu 63



Marlik 10



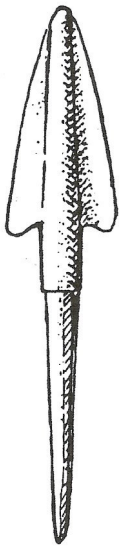
Marlik 23

Sources:

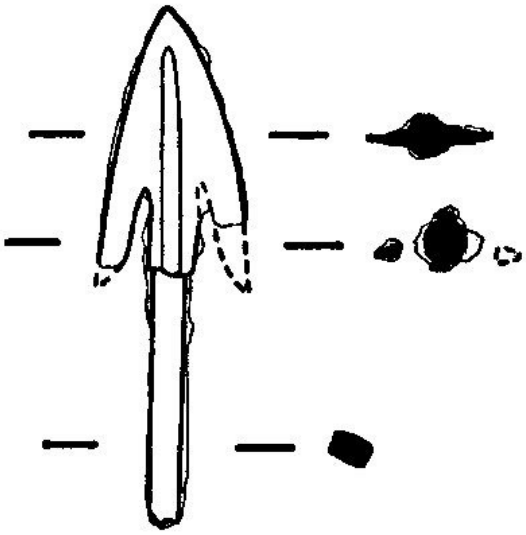
Site	No.	Type	Item No.	Source
Marlik	12	5q-4	41e M	Negahban 1995, p. 82, fig. 59
Marlik	11	5q-4	112a M	Negahban 1995, p. 82, fig. 58
Hasanlu	63	5q-4	HAS 62-1052	Thornton & Pigott 2011, p. 145, fig. 6.6:16
Marlik	10	5q-4	237a M	Negahban 1995, p. 82, fig. 57
Marlik	23	5q-4	326a M	Negahban 1995, p. 83, fig. 65

Plate 209

Type 5q-5

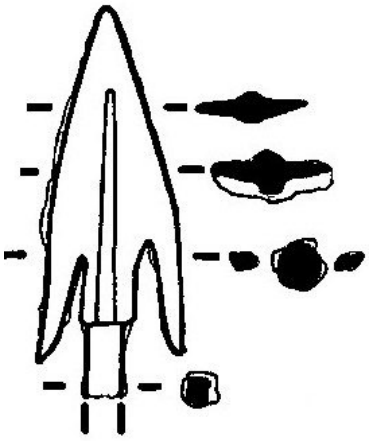


Marlik 9

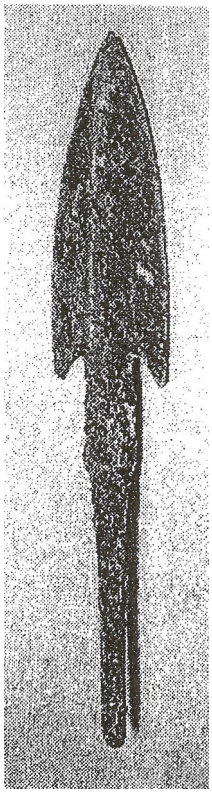


Hasanlu 65

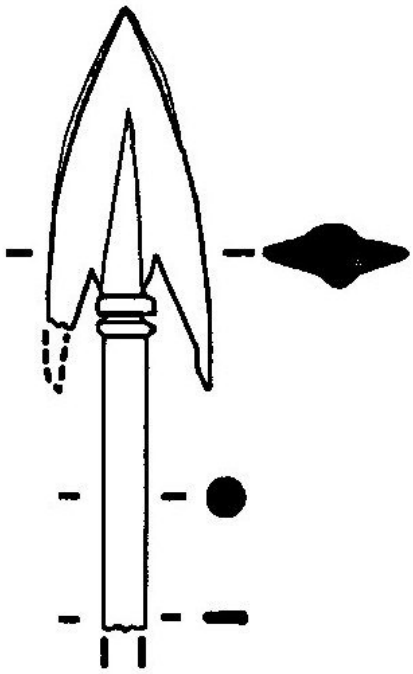
Sultantepe 1



Hasanlu 61



Marlik 19

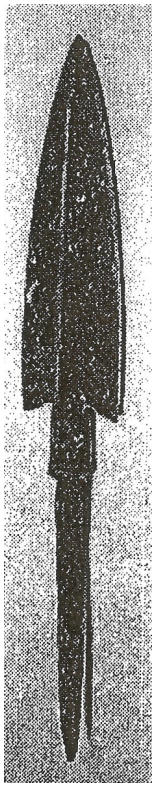


Hasanlu 60

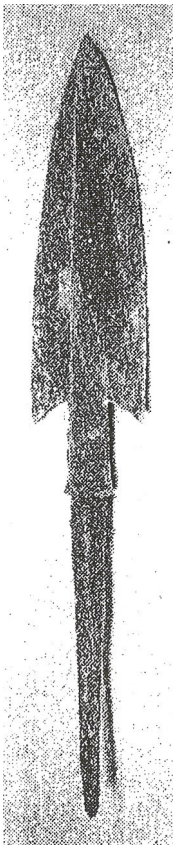
Sources:

Site	No.	Type	Item No.	Source
Marlik	9	5q-5	177 M	Negahban 1995, p. 82, fig. 56
Hasanlu	65	5q-5	HAS 72-N195 A	Thornton & Pigott 2011, p. 145, fig. 6.6:18
Sultantepe	1	5q-5	Fig. 6:2	Lloyd 1954, p. 107, 109; Fig. 6
Hasanlu	61	5q-5	HAS 62-1040	Thornton & Pigott 2011, p. 145, fig. 6.6:14
Marlik	19	5q-5	951a M	Negahban 1995, p. 82, pl. 12:155
Hasanlu	60	5q-5!	HAS 72-107	Thornton & Pigott 2011, p. 145, fig. 6.6:13

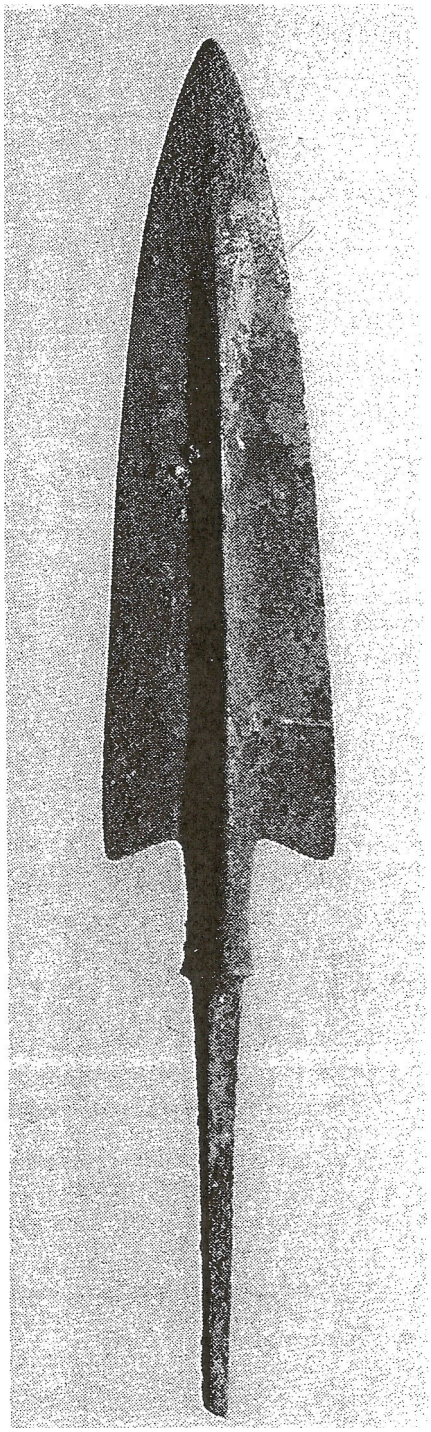
Type 5q-5 (continued)



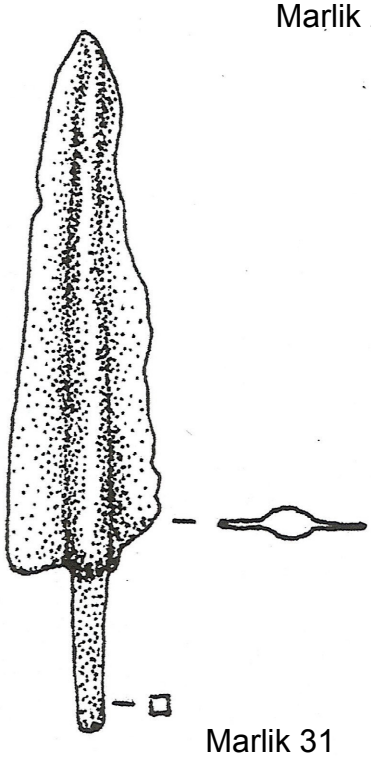
Marlik 17



Marlik 20



Marlik 18



Marlik 31

Sources:

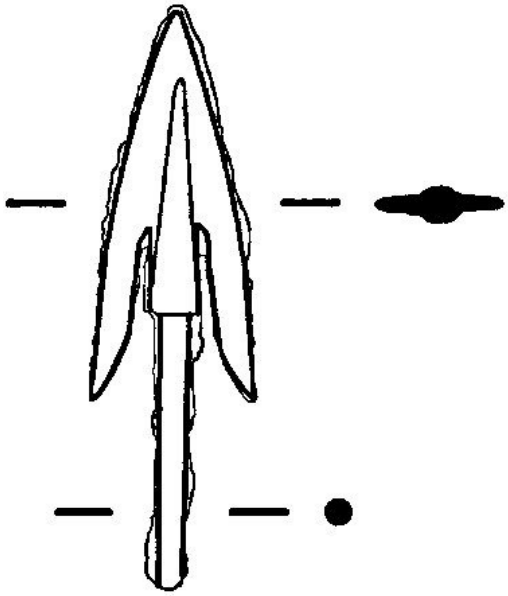
Site	No.	Type	Item No.	Source
Marlik	17	5q-5	769a M	Negahban 1996, p. 279, pl. 126:840
Marlik	20	5q-5	1181b M	Negahban 1995, p. 82, pl. 12:156
Marlik	31	5q-5	326b M	Negahban 1995, p. 86, fig. 70
Marlik	18	5q-5	41f M	Negahban 1996, p. 279, pl. 126:841

Plate 211

Type 5q-6

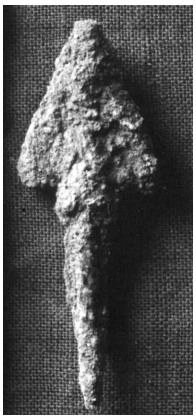
Marlik 41

Type 5q-8



Hasanlu 59

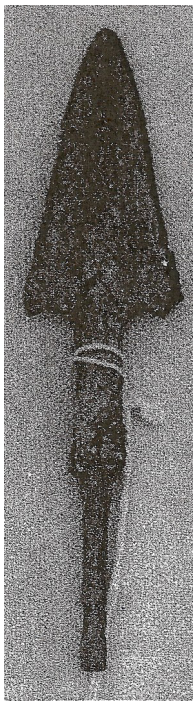
Type 5q-22



Assur 55

Assur 54

Assur 57



Marlik 13

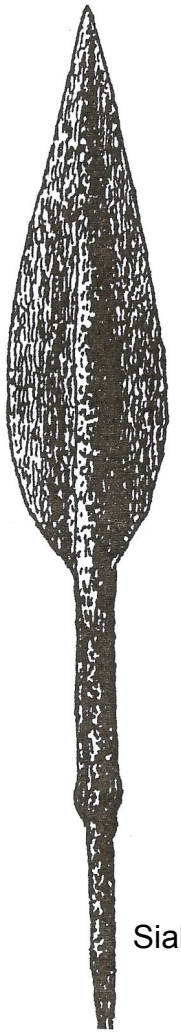
Sources:

Site	No.	Type	Item No.	Source
Marlik	41	5q-6	1525 M	Negahban 1995, p. 87, fig. 80
Hasanlu	59	5q-8	HAS 62-853	Thornton & Pigott 2011, p. 145, fig. 6.6:12
Assur	55	5q-22	12584	Vorderasiatisches Museum Berlin
Assur	54	5q-22	10177	Vorderasiatisches Museum Berlin
Assur	57	5q-22	13258	Vorderasiatisches Museum Berlin
Marlik	13	5q-22	636 M	Negahban 1996, p. 279, pl. 126:836

Plate 212

Type 5r-1

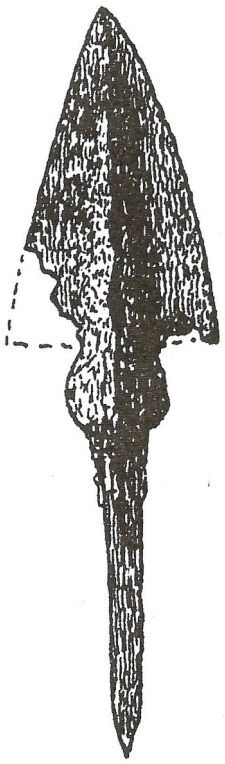
Carchemish 20



Sialk 76

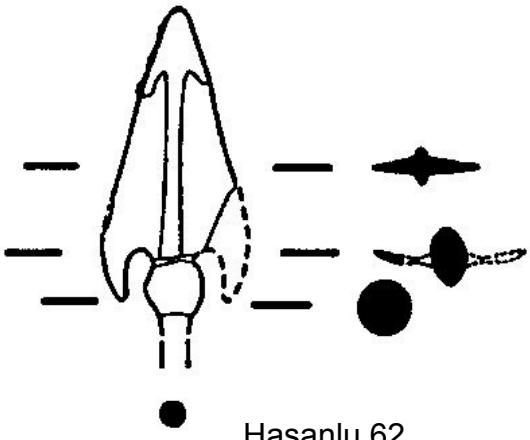
Type 5r-4

Assur 56



Sialk 77

Type 5r-5



Hasanlu 62

Type 5r-20

Sialk 71

Sources:

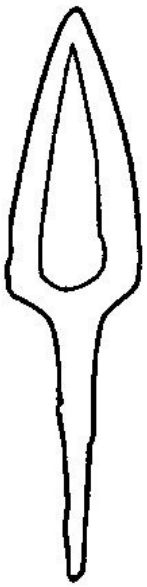
Site	No.	Type	Item No.	Source
Carchemish	20	5r-1	116211	British Museum, 1922-5-11.344
Sialk	76	5r-1	pl. 92:20	Ghirshman 1939, vol. 2, p. 248, pl. 92
Assur	56	5r-4	16642	Vorderasiatisches Museum Berlin
Sialk	77	5r-4	pl. 92:21	Ghirshman 1939, vol. 2, p. 248, pl. 92
Hasanlu	62	5r-5	HAS 60-711	Thornton & Pigott 2011, p. 145, fig. 6.6:15
Sialk	71	5r-20	pl. 92:15	Ghirshman 1939, vol. 2, p. 248, pl. 92

Plate 213

Type 5u-1

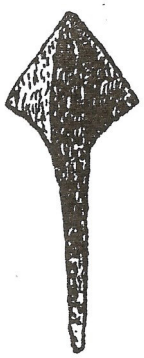
Sialk 58

Sialk 59



Hasanlu 58

Type 5u-21



Sialk 72

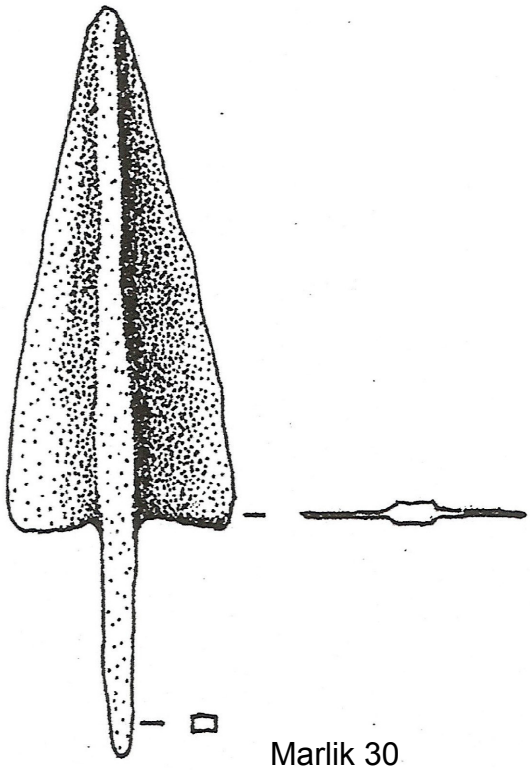
Sialk 69

Sialk 70

Sources:

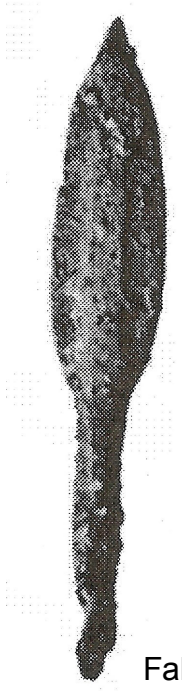
Site	No.	Type	Item No.	Source
Sialk	58	5u-1	pl. 92:2	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	59	5u-1	pl. 92:3	Ghirshman 1939, vol. 2, p. 248, pl. 92
Hasanlu	58	5u-1?	HAS 57-133	Thornton & Pigott 2011, p. 145, fig. 6.6:11
Sialk	72	5u-21!	pl. 92:16	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	69	5u-21	pl. 92:13	Ghirshman 1939, vol. 2, p. 248, pl. 92
Sialk	70	5u-21	pl. 92:14	Ghirshman 1939, vol. 2, p. 248, pl. 92

Type 5u-22



Marlik 30

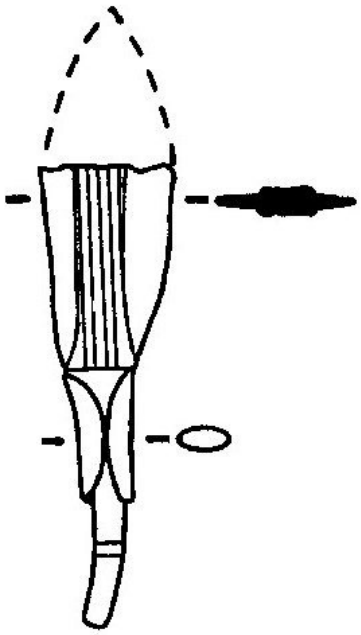
Type 5u-28



Fakhariya 7

Type 5v-1

Assur 2

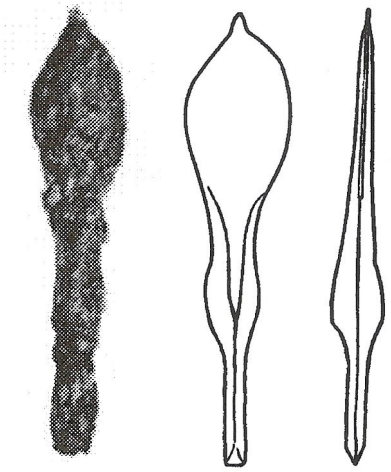


Hasanlu 56

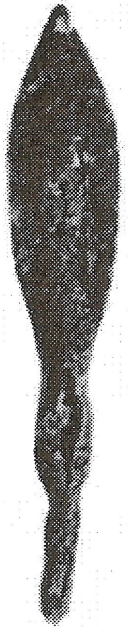
Sources:

Site	No.	Type	Item No.	Source
Marlik	30	5u-22	181 M	Negahban 1995, p. 86, fig. 69
Fakhariya	7	5u-28	F237g	McEwan et al 1957, p. 46, pl. 45:8
Assur	2	5v-1	14289e	Haller 1954, p. 28
Hasanlu	56	5v-1!	HAS 60-710	Thornton & Pigott 2011, p. 145, fig. 6.6:9

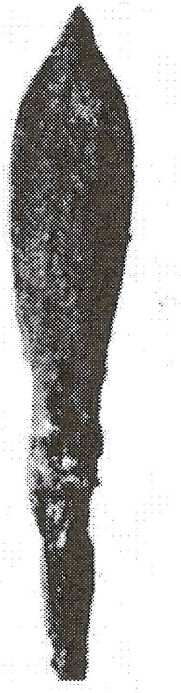
Type 5v-28



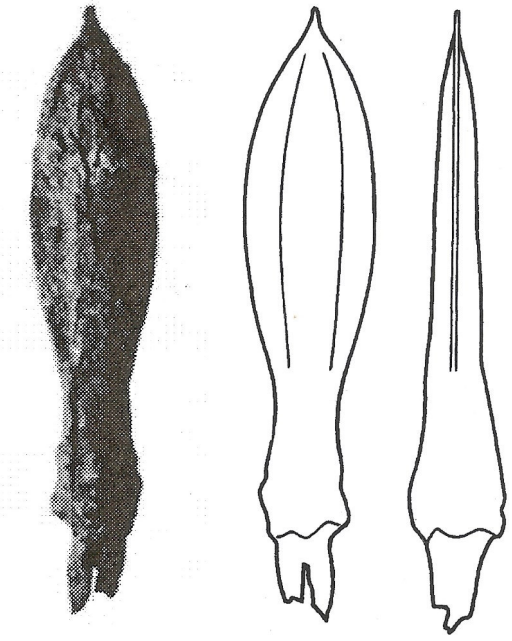
Fakhariya 11



Fakhariya 8



Fakhariya 6



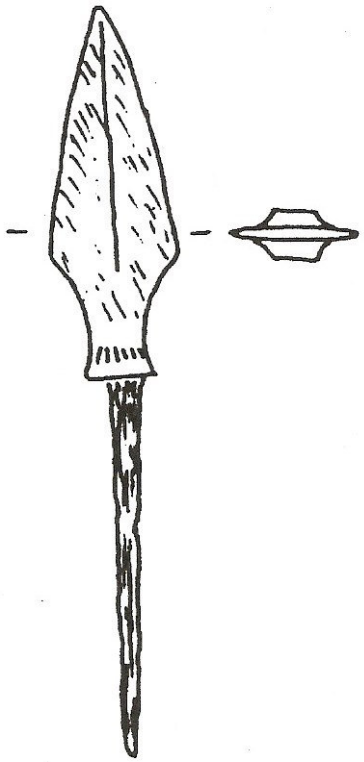
Fakhariya 9

Sources:

Site	No.	Type	Item No.	Source
Fakhariya	11	5v-28!	F237k	McEwan et al 1957, p. 46, pl. 45:12 & 52:15
Fakhariya	8	5v-28	F237h	McEwan et al 1957, p. 46, pl. 45:9
Fakhariya	6	5v-28	F237f	McEwan et al 1957, p. 46, pl. 45:7
Fakhariya	9	5v-28	F237i	McEwan et al 1957, p. 46, pl. 45:10 & 52:16

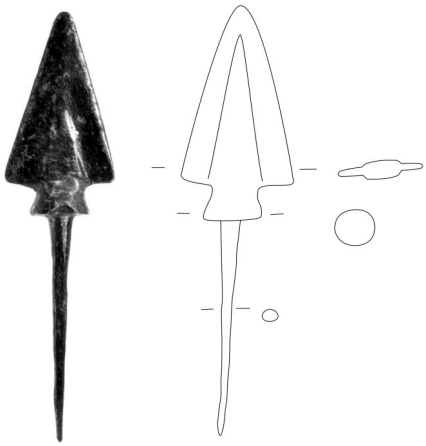
Plate 216

Type 5y-3



Bastam 21

Type 5y-22

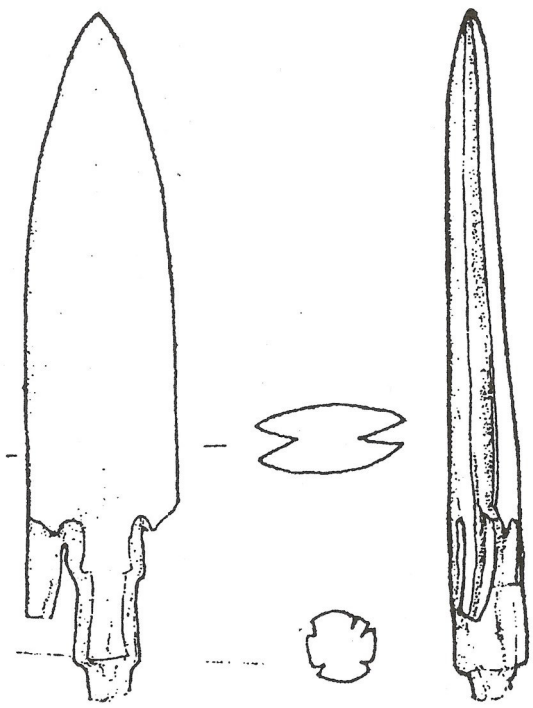


Assur 58

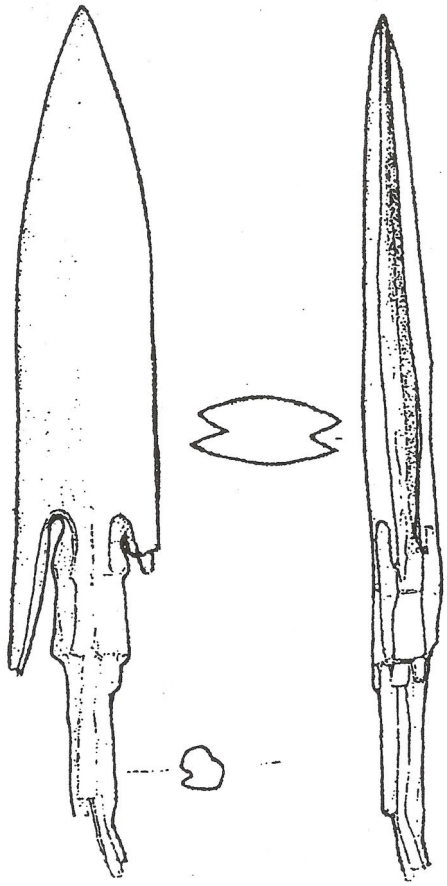
Sources:

Site	No.	Type	Item No.	Source
Bastam	21	5y-3	77/209	Kroll 1988, p. 160, Abb. 3:6
Assur	58	5y-22	10096	Vorderasiatisches Museum Berlin

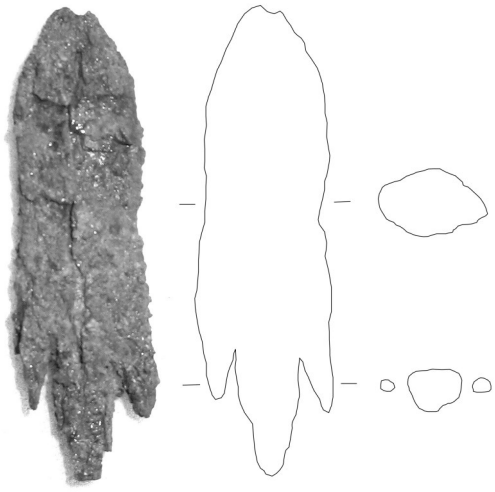
Type 5z-14



Ayanis 88



Ayanis 89



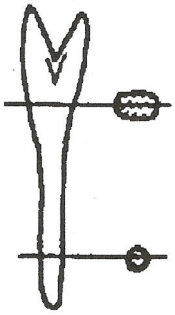
Nimrud 250

Sources:

Site	No.	Type	Item No.	Source
Ayanis	88	5z-14	88	Derın & Muscarella 2001, fig. 6
Ayanis	89	5z-14	89	Derın & Muscarella 2001, fig. 6
Nimrud	250	5z-14	ND 6120	British Museum

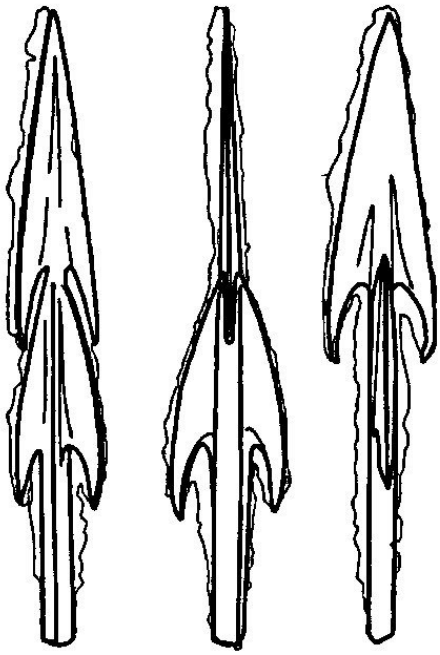
Plate 218

Type 6

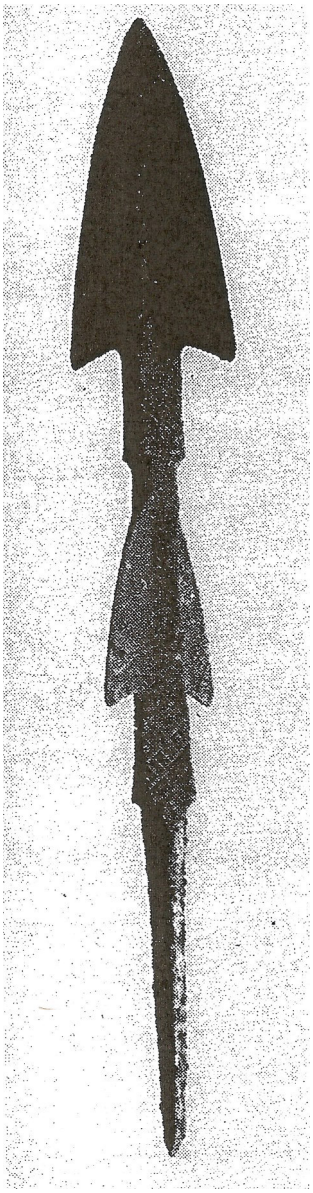


Nippur 4

Type 7d



Hasanlu 47

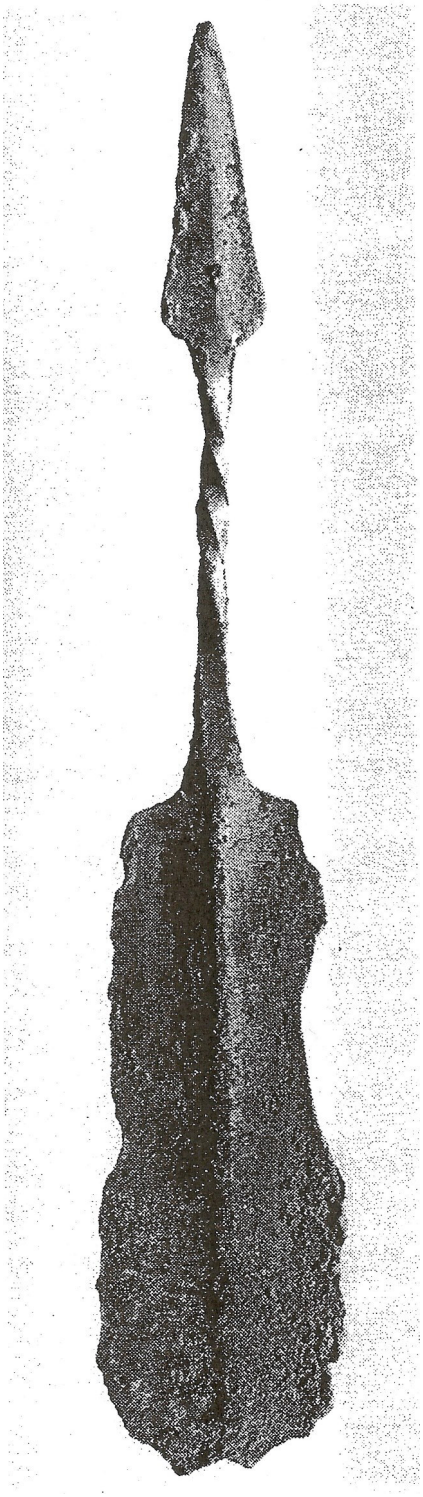


Marlik 3

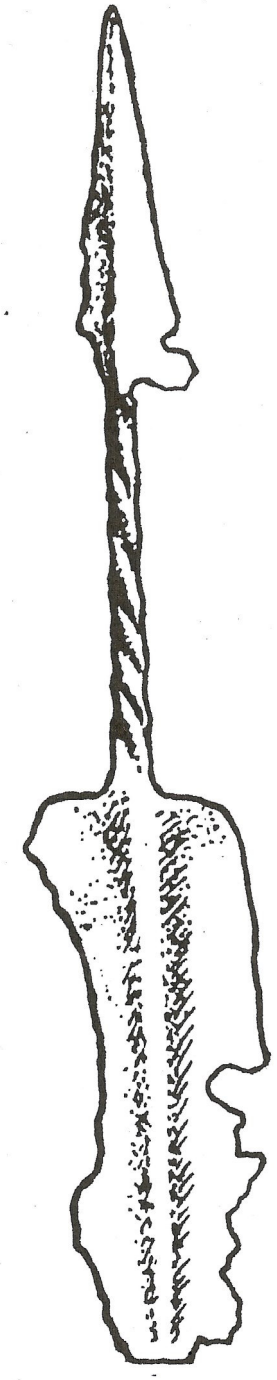
Sources:

Site	No.	Type	Item No.	Source
Nippur	4	6	2N 124	McCown 1967, pl. 154:19
Hasanlu	47	7d	HAS 72-170	Thornton & Pigott 2011, p. 144, fig. 6.5:8
Marlik	3	7d	41a M	Negahban 1996, p. 277, pl. 126:826

Type 8



Marlik 1



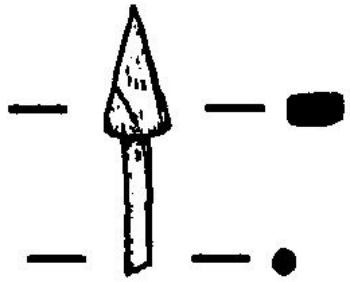
Marlik 2

Sources:

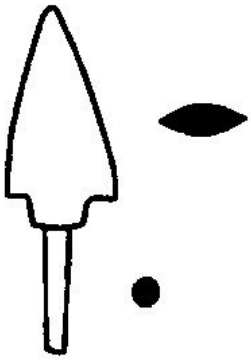
Site	No.	Type	Item No.	Source
Marlik	1	8	56 M	Negahban 1996, p. 275, pl. 126:824
Marlik	2	8	1522 M	Negahban 1995, p. 79, fig. 53

Plate 220

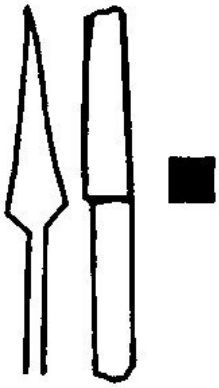
Type 9



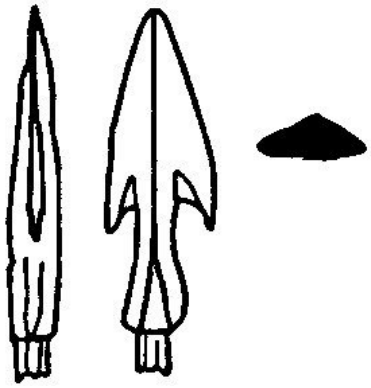
Hasanlu 84



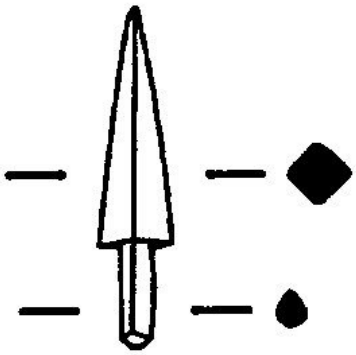
Hasanlu 72



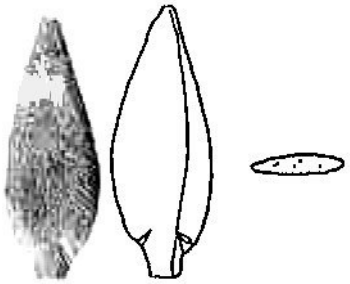
Hasanlu 83



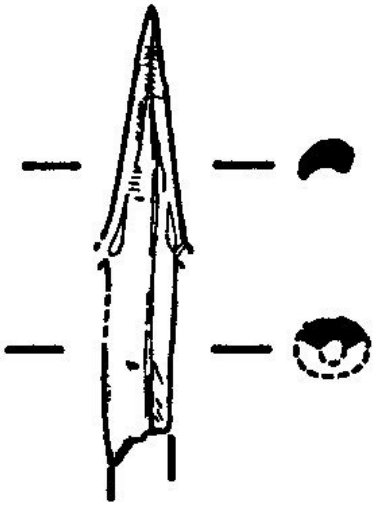
Hasanlu 73



Hasanlu 81

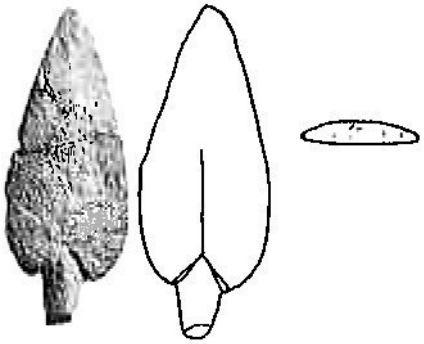


Lachish 84



Hasanlu 76

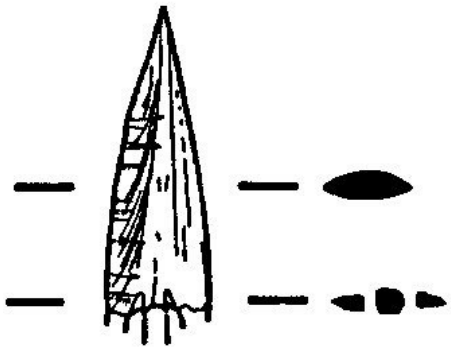
Lachish 12



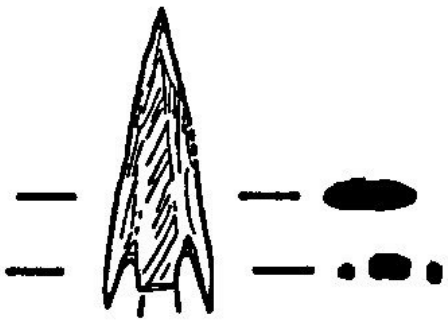
Lachish 83

Sources: see Plate 221

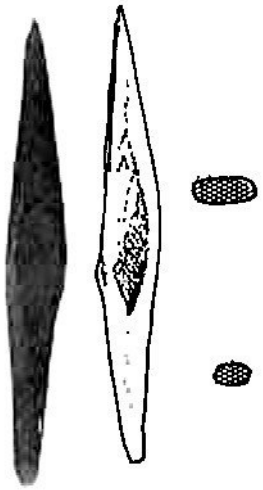
Type 9 (continued)



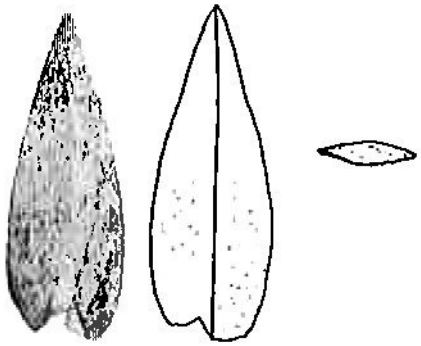
Hasanlu 74



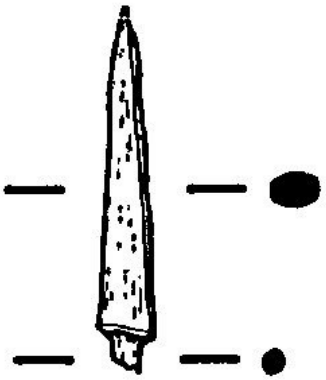
Hasanlu 75



Lachish 82



Lachish 85



Hasanlu 79

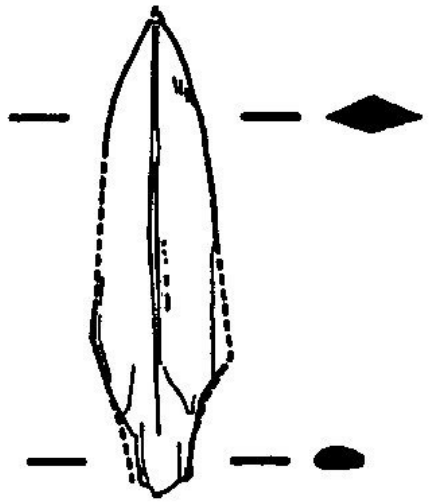
Sources for Plate 220:

Site	No.	Type	Item No.	Source
Hasanlu	84	9	HAS 72-60	Thornton & Pigott 2011, p. 146, fig. 6.7:16
Hasanlu	72	9	HAS 74-422	Thornton & Pigott 2011, p. 146, fig. 6.7:4
Hasanlu	83	9	HAS 70-285	Thornton & Pigott 2011, p. 146, fig. 6.7:15
Hasanlu	73	9	HAS 72-21	Thornton & Pigott 2011, p. 146, fig. 6.7:5
Hasanlu	81	9	HAS 59-267	Thornton & Pigott 2011, p. 146, fig. 6.7:13
Lachish	84	9	61982/40	Gottlieb 2004, p. 1911, fig. 27.1:11
Hasanlu	76	9	HAS 70-286	Thornton & Pigott 2011, p. 146, fig. 6.7:8
Lachish	12	9	6827	Tufnell et al 1953, p. 119, pl. 63:18
Lachish	83	9	60805/40	Gottlieb 2004, p. 1911, fig. 27.1:10

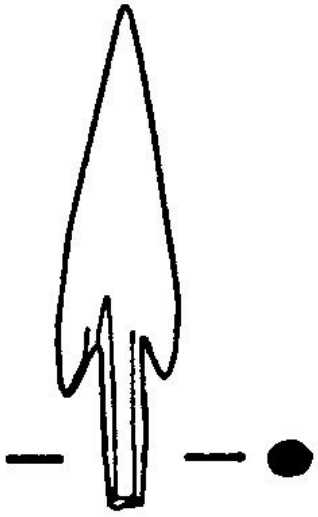
Sources for Plate 221:

Hasanlu	74	9	HAS 60-38	Thornton & Pigott 2011, p. 146, fig. 6.7:6
Hasanlu	75	9	HAS 62-1088	Thornton & Pigott 2011, p. 146, fig. 6.7:7
Lachish	82	9	31072/40	Gottlieb 2004, p. 1911, fig. 27.1:8
Lachish	85	9	62113/40	Gottlieb 2004, p. 1911, fig. 27.1:12
Hasanlu	79	9	HAS 70-556	Thornton & Pigott 2011, p. 146, fig. 6.7:11

Type 9 (continued)

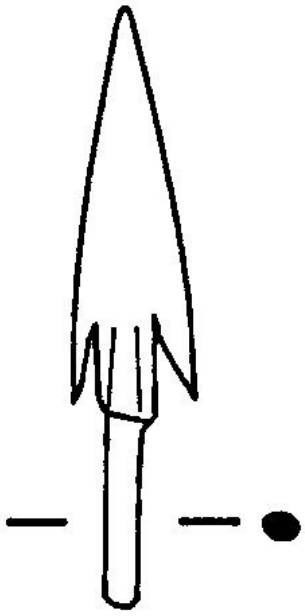


Hasanlu 69

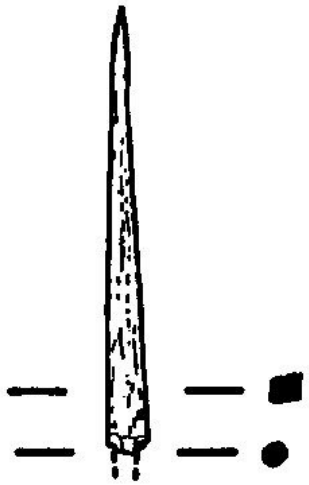


Hasanlu 71

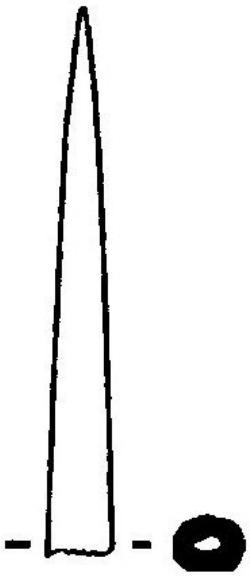
Lachish 10



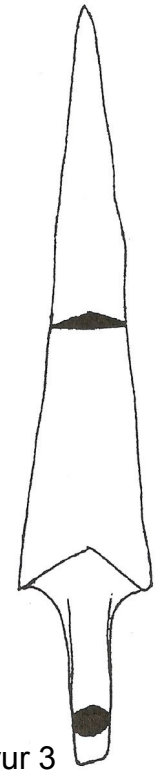
Hasanlu 70



Hasanlu 78



Hasanlu 77



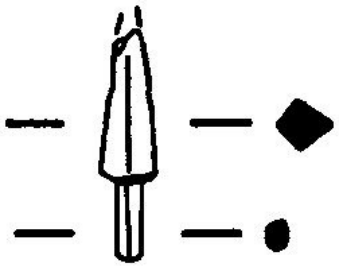
Karchaghbyur 3

Sources:

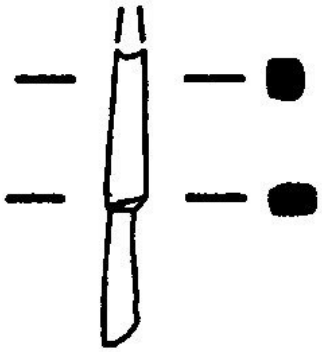
Site	No.	Type	Item No.	Source
Hasanlu	69	9	HAS 70-516	Thornton & Pigott 2011, p. 146, fig. 6.7:1
Hasanlu	71	9	HAS 70-284	Thornton & Pigott 2011, p. 146, fig. 6.7:3
Lachish	10	9	6825	Tufnell et al 1953, p. 119, pl. 63:16
Hasanlu	70	9	HAS 62-671	Thornton & Pigott 2011, p. 146, fig. 6.7:2
Hasanlu	78	9	HAS 61-410	Thornton & Pigott 2011, p. 146, fig. 6.7:10
Hasanlu	77	9	HAS 60-77	Thornton & Pigott 2011, p. 146, fig. 6.7:9
Karchaghbyur	3	9	pl. 6:6	Yengibaryan 2002, p. 420, pl. 6:6

Plate 223

Type 9 (continued)

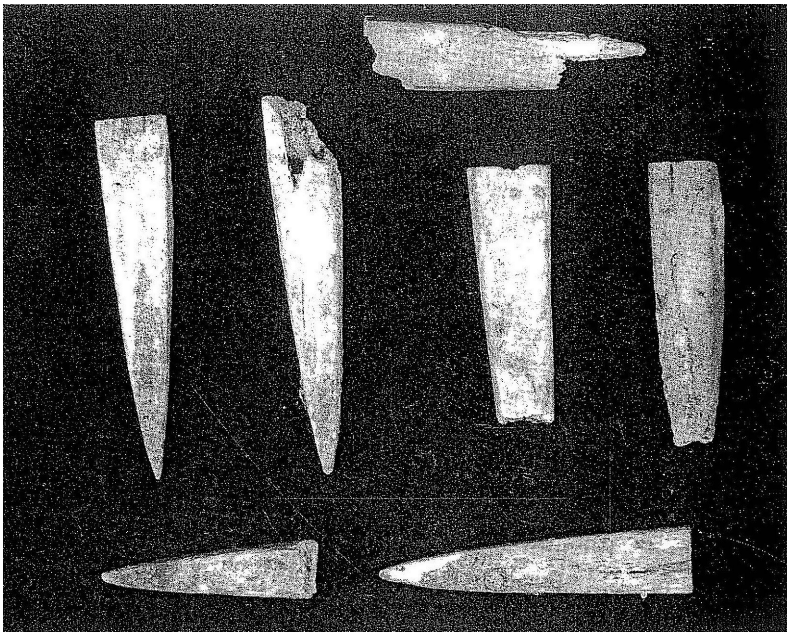


Hasanlu 82



Hasanlu 80

Lachish 11



Marlik 42-47

Sources:

Site	No.	Type	Item No.	Source
Hasanlu	82	9	HAS 74-N676	Thornton & Pigott 2011, p. 146, fig. 6.7:14
Hasanlu	80	9	HAS 60-80	Thornton & Pigott 2011, p. 146, fig. 6.7:12
Lachish	11	9	6826	Tufnell et al 1953, p. 119, pl. 63:17
Marlik	42-47	9	179 M	Negahban 1996, p. 281, pl. 127:863