Bow Designs on Ancient Greek Vases

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Abstract: *This research looks to investigate the designs of ancient bows depicted on ancient Greek pottery. The goal is to show that the bows most commonly shown are not native to the Greek mainland but rather are from Scythia and Egypt. This has been done by examining a number of vases, pyramid friezes, and modern bow reconstructions. The common use of the Scythian design for archer characters in scenes of myth implies a familiarity with archery primarily through the Scythian mercenaries. The Egyptian acacia deflex bow design, while rare in vase depictions, directly corresponds to images on pyramids. The Egyptian angular composite bow appears in a rare case on a Greek vase, but its depiction is consistent with modern historical reconstructions. Through showing these non-native bow origins, this paper hopes to further demonstrate the worldly influences on archaic Greece.*

The practice of archery is ancient, as is its depiction in art. Analysis of the bow's form provides a unique insight into the ancient world. This is because a culture's bow design is a direct reflection of its environment. From the single-piece English Yew longbow to the massive Japanese Yumi to the compact Mongolian horse bow, the available materials dictate the form of the tool. A bow's design is also influenced by contact with other civilizations. For historians, an understanding of bow design can give information about how an ancient society interacted with different cultures. Luckily for the ancient Greek world, the image of the bow and arrow is prevalent in the wealth of vase paintings. We see bows used by mythical figures such as Herakles, as well as by the gods and goddesses Artemis and Apollo. There are also plenty of depictions of unnamed figures, especially mercenaries. Just as the bows are wielded by a variety of characters, their designs also vary greatly. Throughout the vases studied, one particular bow construction, the Scythian recurve, is by far the most common, but it is not the only kind. The designs of the short composite recurve, deflexed-tip, and angular composite bow are not native to Greece, but they were adopted by Greek vase painters to portray a variety of archers.

Before diving into the images, a quick explanation for bow design may prove useful. This is because unlike more static weapons such as swords, bows must bend and snap back to cast an arrow. The limbs of the bow bend as it is pulled back, resulting in an increase of potential energy. When the string is released, this potential energy becomes kinetic energy. This kinetic energy in the bow limbs is transferred to the arrow, which is launched through the air at a high velocity. This activity puts a great deal of strain on the bow, which can even lead to it breaking if it is not properly constructed. An essential step to making a bow involves the proper shaping of the limbs so that they bend smoothly and symmetrically. This process is called "tillering". Bows that are tillered improperly are less efficient at transferring kinetic energy into the arrow. Lost efficiency means that an archer gets less speed and power from their arrows. Fast arrows are important because they provide more large game, kill more enemies, and fly through more axe-heads. This understanding is essential once we discuss these bow designs.

When looking at the bows depicted on vases, one must think about how much a vase painter would know about how bows worked and about archery in general. Now it would not be essential for a painter to understand the process of tillering described earlier, but a fundamental misunderstanding in its function could lead to some issues in representation. Here is an example of an explicit mistake in depicting a bow: a scene shows Athena introducing Herakles to Zeus on an Athenian black-figured lip cup, or little master cup, painted by Phrynos, c. 545 BCE.[8]

Athena introducing Herakles to Zeus: Accessed Via theoi.com, as seen in "Study Images"

Herakles wields a bow which has tips that curve so much that the string is on the inside of the bow limb. Such a stringing method would not work in a bow, because if it were drawn the bow limbs would not do any work, and the curved tip would simply break under the strain. In this case, it seems that the painter became overzealous in creating the elegant recurved bow tip and ended up creating a thing of fantasy rather than reality. This mistake was likely borne from a painter who was not entirely familiar with how a bow works. J. K. Anderson says that "It should be considered that a hunter armed with a bow or a sling could only hope to hit a flying bird by chance or by a miracle."[2] Other than this superhuman accomplishment, the bow was ignored in favor of the spear. In fact, it seems that there is not much attention given to archery in ancient Greek hunting. A lack of familiarity with archery could cause such mistakes as seen in this case. Yet this appears to be a one-off mistake rather than a regular pattern used by painters. Errors aside, the most common bow found in Greek vases is a pinnacle of efficiency.

The short "recurve" bow, found on predominantly Attic vases, was used by the Scythian archers. The recurve has tips which curve away from the user, hence the term "re-curve". This additional curve provides added efficiency, which translates to a faster arrow speed. The recurve construction was prominent among the Scythians; whose archers were famed mercenaries. M. F. Vos says that "The vase-painters always agree as to the shape of the bow: they depict with extreme accuracy the typically Scythian composite bow, which curves inwards in the centre, and whose ends are curving outwards."[11]This consistent profile produced a very efficient bow. Their function is to store additional energy in the limbs, as they bend more when the bow is strung. As for the materials, "The Scythian bow being made of wood and horn, no examples are extant, but there are descriptions by ancient authors."[11]These materials are commonly used to make "composite bows," or bows out of multiple materials. A combination of wood and horn in layers gives the bow more power than wood alone. Such a development is also essential in areas where wood is scarce, such as in plains and deserts. Vos explains that "the bulk of the pictures with barbarian archers belong to the period of c. 530-490 B.C. But also in the first half of the sixth century and down to c. 540 barbarian archers occur occasionally on Attic vases."[11] This means that, for a large part of the Archaic period, the predominant image of the archer was this kind of mercenary.

The image of a Scythian archer was very common, and their weapons were portrayed in a consistent manner on Greek vases. Two examples are representative of the general body of works. A Scythian archer is depicted in a battle scene on an Attic black-figure Nikosthenic amphora from Cerveteri made between 530-510 BCE.[10] A man in Scythian dress holds a bow, which is roughly the length from his waist to his feet if he were standing. This actually seems to be a larger than average depiction of this type of bow. The details of his hand placement are obscured by the rim on the vase, but his right elbow is held completely vertically, which appears to be physically impossible, not to mention ineffective for drawing a bow. This decision seems to be made in order to prevent his arm from encroaching on the nearby handle. This seems to imply

that the painter was familiar with the image of the Scythian and his bow, but he was perhaps, like others we've seen, not as familiar with the particulars of archery, or at least willing to sacrifice accuracy for artistic cohesion. In another instance, a Scythian mercenary is seen on a red figure plate painted by Epiktetosbetween520-510 BCE.[8] A Scythian archer holds a bow and draws an arrow from his quiver. The quiver is attached by a long strap across his shoulders and hangs at his waist, which is common in images of Scythians. The pronounced set of curves by the handle and the working recurved tips are indicative of the Scythian design. The smaller size, roughly reaching from his foot to the top of his thigh, is more representative of the average Scythian recurve bow. Yet this style of bow is not limited to images of these particular mercenaries on Greek vases.

The Scythian design is given to the bows of other fictional characters as well, including those in Homer's epic poems. Vase paintings showing both the Trojan prince Paris and the Achaean hero Odysseus include this same recurve. On an Athenian red figured pelike by the Niobid painter ca. 460 BCE[8], Paris shoots Achilles in the ankle. He knocks and draws an arrow whilst another races towards the hero's tendon. Perhaps Paris' use of the bow could be a sign of the foreign environment, similar to the presence of a palm tree on some vases. Both the Scythians and the Trojans could have been part of a generalized "east" to a Greek vase painter. In this case, the use of this barbarian bow would help localize the story. Yet the same could not be said in the case of Odysseus. On an Attic red-figure skyphos by the Penelope Painter c. 440 BCE, we see the scene in which Odysseus kills the suitors.[3]

Odysseus kills the Suitors: Accessed Via Shelton.Berkeley.edu, as seen in *Greek Vases: Gods, Heroes and Mortals*

Odysseus is using a recurve bow, again of the Scythian style. This is the bow that has been at his home during his absence, in which case it could not signify a foreign location. The idea that these characters are supposed to be using foreign bows gets broken down even further, as another native Greek hero uses the same design.

Even more prevalent on Greek vases is the depiction of Herakles with the Scythian bow. On a Corinthian crater dating to pre-mid-6th century BCE, Herakles defends Hesione from a sea monster.[4] Herakles has a recurve bow with a very thick string. The lower limb is thinner and curves slightly toward Herakles near the handle, rather than away as the upper limb properly does. In this case, it seems that this bow is not supposed to make any reference to Scythia or any non-Greek location at all. This vase does date to the earliest references to Scythians, which could mean that the prevalence of the archers could have had an early, lasting impact on the depiction of native Greek archers. This use of the Scythian bow design for all archers makes sense, as it's likely that for Greek vase painters, these mercenaries were the most common image of the archer. Such a simple conclusion is impossible, however, because this is not the only bow design found on Greek vases. The Gigantomachy is painted on an Attic red figure amphora by the Suessula Painter, c.425 BCE.[4] Again, Herakles wields a recurve bow, while an unknown figure to the upper right holds what looks like Herakles' bow as it bends at the handle but lacks the recurved tips. The divine siblings Artemis

and Apollo also have bows, but they look very different. These bows require a closer look and a different approach to ascertain their origins.

Artemis and Apollo's peculiar bow is depicted multiple times, which implies that it is an actual design rather than an isolated mistake. Artemis and Apollo wield bows with an odd, "deflexed", or "whip-ended" design. In these bows, the tips bend in the opposite direction of the recurve. In the Gigantomachy painting, Artemis and Apollo hold these deflexed bows, which are roughly the same size as the Scythian recurves. Apollo's bow has a sharper bend at the tips of his bow, while those on Artemis' bow are more gradual. These bows show up again as the Niobid Painter depicts the Death of the Niobidson a Red-figured calyx-krater between 470 and 450 BCE.[5]

These are considerably longer than the bows in the Gigantomachy painting, as Artemis' is the length from her feet to her chest. The limbs are very straight for the most part, even though Apollo is drawing back an arrow. Just like in the Gigantomachy painting, the ends curve sharply towards the user almost at a 90-degree angle. Once again, the deflex of Artemis' bow is slightly less exaggerated than Apollo's. Given the rarity of this kind of bow on Greek vases, one might be tempted to think that this design is simply an attribute to show the identity of the twins. Yet this cannot be the case, because Artemis does not always use this kind of bow when she is depicted on pottery.

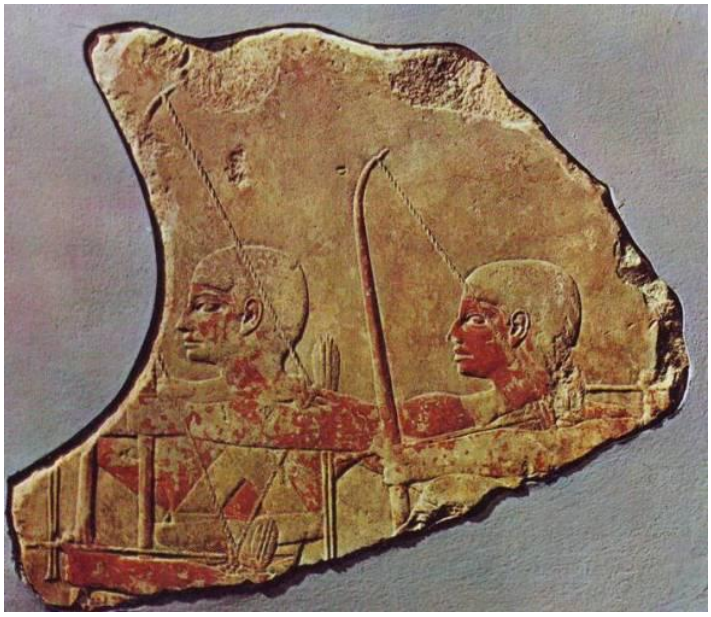
This rare bow is not the only kind the twins use, meaning that it is not a special characteristic of the deities. One painting shows Artemis with a bow, torch and dog while approaching an altar, on a Corinthian ('Wide group") cup, mid-5th century BCE.[4] Artemis holds a recurved, Scythian style bow. The bottom limb is slightly shorter than the upper limb, and it is not curved at all. Despite this slight issue, the overall silhouette of the recurve can still be easily recognized. The string is depicted as a series of small dots, which cleverly shows the common two-ply twist of the bowstring. Here Artemis uses the Scythian recurve, just like the majority of mythical characters. The difference could be due to location, given that this is a Corinthian piece and the examples with the deflex bow are from the area of Athens. Unfortunately for that argument, another example can be found in a painting of the assembly of gods on an Attic white-ground drinking cup by the potter Nikosthenes c. 520/510 BCE.[3] Artemis is depicted sitting with, once again, a recurve bow. The recurved tip at the bottom limb is thinner and is more curved than the upper limb, but it still matches the Scythian recurve design. This vase comes from the Athens area, so the difference between whether Artemis uses a whip-ended or recurve bow does not seem to have a regional basis. The occurrence of the deflex design also is roughly contemporary with these paintings, so it does not seem that one design replaced the other. This means that the whip-ended bow was not particularly special to the characters of Artemis and Apollo.

In fact, Apollo and Artemis aren't the only ones who use this kind of bow, as it is seen in the hands of a minor mythical character. A vase by the Polygnotos group shows the Greeks fighting the Amazons.[9] One unnamed Amazon is felled while she still holds her weapons. In one hand, she has a small battle axe, in the other she holds the familiar deflex bow. The fact that she does not appear to be a named character seems to imply that her weapon is not special either. This image, along with the Death of the Niobids, is hypothesized to be an imitation of the larger scale paintings of Mikon.[9] If this is the case, the image of the whip ended bow may have been more common than what is seen in the extant vase records. This evidence indicates that the peculiar bow shape is a valid depiction of an actual bow design from the ancient world.

The reason behind this bow's special design also reveals its origin. All things being equal, this design is less efficient than the simple arc of a longbow or a recurve. This is because with

the deflexed ends, the tips bend the most, meaning they do the most work while the majority of the limb moves very little. This is not especially efficient, because the ideal is to have every part of the bow storing and then transferring energy to the arrow. Yet the *Traditional Bowyer's Bible* describes the reasoning behind the whip ended design, explaining that it came about due to a lack of good bow wood: "Exactly such a problem confronted Indians of the Southwest, who were forced to use willow for bows. And a peculiar design appears among these bows: deflexed tips. Such a bow is under no strain when braced. Its full energy storing capacity is now available to the arrow."[1] While this profile will not make a bow as effective as the Scythians had, it was certainly better than nothing. Perhaps, then, this was the native Greek bow, which was eventually replaced by the more effective Scythian bow. Yet this possibility seems less likely given the evidence that this bow, like the Scythian recurve, came from outside Greece.

Rather than being native to Greece, it seems that the deflex bow is from ancient Egypt. After describing the whip ended design, the bowyers mention that "Similar deflex-tip designs were used in ancient Egypt. Such bows were reportedly made of acacia."[1] There is good pictorial evidence of this bow design being used in Egypt. One block from the remains of the pyramid of Amenemhet I shows a group of archers.[6] The upper limb of a bow can be clearly seen to have the familiar deflexed tip. This bow, like Apollo's in the Death of the Niobids, remains straight-limbed despite being drawn. The bow also appears to be quite long, similar to the size of the bows in the Death of the Niobids. As discussed earlier, the vases which depict these Egyptian bows may have been inspired by monumental wall paintings. Perhaps, then, the painter Mikon or one of his contemporaries was inspired by images from Egypt, whether through observing actual bows being used by Egyptian archers or merely the images on a monument. How the images came to Greece is less important than the fact that they were eventually adopted on the longer lasting vases. The whip ended bow may not have been the only bow construction that Greece borrowed from Egypt.



Group of Archers: Accessed via bible-archaeology.info, as seen in *Re-used Blocks from the Pyramid of Amenemhet I at Lisht*

Unknown scene with Herakles: Accessed vialouvre.fr, as seen in *Looking at Greek Vases*

An even more peculiar bow design seen on a Greek vase is likely inspired by the Egyptian angular composite bow. This bow is found in an uncertain scene with Herakles and Athena on an Attic red-figure calyx krater from c. 460 BCE.[10] Herakles holds a very different take on his typical recurve bow. At the top of the handle, right above where he holds the bow in his left hand, the upper limb bends at roughly a 45-degree angle with respect to the lower limb. This results in a strung bow that looks like a triangle. Yet what may appear to be another painter's mistake seems to in fact be a depiction of the Egyptian "angular composite bow". The bow, made from wood, horn and sinew, had an angled handle when the bow was strung.[7] This documentary also explains that the deflexed bow design was an earlier form, which was eventually replaced with the composite. Another bowyer who reconstructed this composite explains that, when strung, the bow must have a high brace height of seven and a half inches.[12] The "brace height" is the distance between the bow handle and the bow string when the bow is strung, or "braced". Seven and a half inches is a very high brace height. This helps explain the appearance of Herakles' bow on the krater, as it also looks to have a very high brace height, creating the triangular bow shape. The presence of these different Egyptian bows on Greek pottery shows another level of influence local cultures had on Greek life.

Reconstructed Egyptian Angular Composite: Accessed via primitivearcher.com, as seen in "Shooting – Egyptian Angular Horn Composite"

With the wealth of foreign bow designs, there is a distinct lack of pottery evidence depicting a native Greek bow. While archery was not especially popular for the Greeks, it seems unlikely that there was no bow at all before the Scythians introduced their recurve. Archery is described in Homer's *Iliad* and *Odyssey*, which were composed before the Scythians were introduced en masse to Greece. The only evidence of what could possibly be a native Greek bow is on an Attic red-figure amphora by Andokides as potter and the Andokides painter, c. 530/525 BCE.[3] This work is titled "In the wrestling school". Here Apollo is depicted with a short bow. There is a very small curve at the tips, but it is likely not a stunted recurve. This is because the deflexed bows in the Death of the

Niobids also have this small curve at the end. It is likely that the small hook is a form of knock which holds the bowstring. In that case, Apollo is holding a simple, single piece short bow. Perhaps this is a rare depiction of a Greek bow. The design is simple, and it was likely to be less effective than the Scythian recurve, so it is understandable for it to fall by the wayside.

In observing the collection of bow designs on Greek Black and Red Figure pottery, we see an interesting pattern emerge. The bow compositions on Greek vases are revealed to be from other parts of the world. The recurve bow comes from Scythia, while the deflexed and angular composite bows come from Egypt. This is yet another aspect of Greek life that was influenced by the many cultures of the Near East and North Africa. It is especially notable to see that a foreign design became the dominant motif, even for fundamentally Greek heroes and gods. In this way, the bow again serves to provide further insights into the ancient world.

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