

ARCHERY IN TURKS

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1. Introduction

The use of bow and arrow has been one of the indispensable weapons for all civilizations for about 4000 years. Nomadic communities, carrying archery on horseback, fought for dominance in the Asian steppes, and they dominated the settled communities and their armies with weak maneuver power. This much; they were indebted to their strong, agile, agile horses and their warriors, who showed great dexterity on them and could easily use all kinds of weapons. The Turkish warriors, who could shoot arrows in all four directions while galloping their horses, were very good riders. “The Turks have made the bow and arrow an effective weapon of war and have made the best use of it for their own combat tactics. By using the bow as an effective combat tool on a rapidly running horse, they developed the distance warfare method as an innovation in the combat tactics system” (Kafesoğlu, 1992).

Compound bows, which were seen as the best application of the period in all aspects, were very suitable for use on horseback. These compound bows, which had composite properties in contrast to the monolithic bows of other civilizations, were small but with a very high traction power. Undoubtedly, they also mechanically guided the emergence of "ballistas", under which the idea of throwing spears further away prevails. These hunting weapons, which are called staves, spears, and javelins in the literature, are known as the oldest among thrown materials. In this sense, the transition from thrown thrown to tension thrown has led to the emergence of a new war tactic and technology. This compound springs with composite properties; Due to its aerodynamic structure, it provides the opportunity to shoot with a strong tension. This strong tension makes it possible to pierce leather armor and, moreover, metal armor of that period. It is also worth mentioning the tirkeş (war arrows) metal-tipped arrows used to pierce armor in such powerful bows. Arrows whose structural features change according to their intended use; The spiritual power of the state loaded on these arrows, as the tool of the blood to reach the sky, has spiritual, spiritual, sportive and, of course, duties on war.

Besides all these; “We see that the term –ok- is used instead of clan when talking about the Turkish military and clan organization in Orhon monuments” (Öngel, 2001a). It seems that the Turks; “Beyond being a war tool, they adopted these weapons as an important spiritual cultural element and used them as political and legal symbols by forming some conventions around these weapons” (Göksu, 2018). All these missions have made it the most important and most powerful weapon of the steppe.

The bow and arrow was an important weapon for most civilizations. Civilizations have shaped this weapon according to the place and purpose they use. They have been designed in different sizes for different purposes such as using on horseback, using on foot or using from the castle walls. “Turkish bows are the shortest among Arab, Iranian, Crimean-Tatar, Indian and Sindh, Korean, Japanese and Chinese bows” (Göksu, 2018). The steppe communities in the north preferred to use the bow and arrow on horseback. This must be the biggest feature that distinguishes the Turkish bow from the bows of other civilizations. Because Turkish bows were

suitable for use on horses. For this reason, they could easily shoot by turning to the right or left on the horse, and even while escaping from the enemy, they could shoot arrows by turning back. In this sense, the ability to dominate the horse after it has been domesticated and to shoot the target by pulling a bow on it has enabled them to be superior to the surrounding civilizations.

The use of bows and arrows has not lost its importance hundreds of years after gunpowder was invented. The bow and arrow has been the symbol of domination for centuries on the stage of history. Although the use of gunpowder in firearms dates back to 1500 years, more time was needed to facilitate the use of guns. It was not easy for one person to carry and fire the first gunpowder rifles. The gun took time to set up, load and fire, and clean and reload for the next shot. From this perspective, it was not yet an economic weapon. While these weapons were ready for firing in about three minutes, an archer could shoot more than 30 accurate arrows in the same time. Moreover, the range of these weapons was also quite short at first. "One arrow; 10 dirhams (32 grams) at most, a hundred arrows weighing just over three kilos. An archer must carry at least a hundred arrows on his quiver when going into battle. Even so, it can be said that it is more economical than gunpowder guns" (Tuzcuoğulları, 2020a). Although there are no records from that period, we know that the violinists who used the Ottoman compound bows with the same characteristics could not open a register and get a grip in the archers lodge without throwing 900 trips (594 meters). Moreover, Tozkoparan İskender has a record of 845 meters in range archery.

The most effective weapon used in the wars between the British and the French, also known as the century wars, was the Longbow (long bow). They are known as the weapons that won the war in the battle of Edincourt. "The British longbow had a draw weight of 80 to 150 pounds, which had an effective range of up to 350 yards" (Hemming, 2022). This comes to a distance of 320 meters. The range shooting of the Turkish violinists and, of course, the range reached by Tozkoparan deserves praise.

In this sense, the "Archer Lodge" should also be mentioned. After conquering Istanbul, Fatih allocated an area for the training of archers. This area was originally Fatih's; "It is the square where he established his tent during the conquest of Istanbul (Hero, 1995, p.41). "Fatih's son II. Bayezid developed archery and established a full-fledged lodge in this area, and it was called the Okçular Lodge (Erkal, 1983; Fişek 1985; Köseoğlu, 1952; Yönel and Türkmen, 2017). Arrow fields were not only limited to Istanbul, there were arrow fields in many Ottoman provinces. The most famous of them are those in Bursa and Amasya.

Archery in Turks; It is a very comprehensive subject that covers the geography extending from Central Asia, the first settlement of the Turks, to Anatolia. In this study, attention was drawn to the value, structure and purpose of use of arrows and bows in Turks, and general information on archery in Turkish geography was mentioned periodically.

2. Symbolic and Spiritual Value of Arrows and Bows in Turks

In the Turkish state tradition, the bow and arrow had not only a symbolic value, but also an important place in the establishment and administration of the state. In this sense, let's remember the words of Oğuz Kağan: "My sons, let the bow be yours, throw the arrows into the sky like the bow" to the first ones (Day, Moon, Star) representing the domination, and - O my little sons, let the arrows be yours, the bow shot the arrow and you too. The fact that he gave

the arrow representing the subjection to the Second (Sky, Mountain, Sea) in the form of "Be like" was interpreted to mean that the Üçoks were subject to the Bozoks". (Kafesoğlu, 1992; Güven, 1999; Yücel, 1999; İmamoğlu et al. 1999; Aktepe, 2012; Küçük, 2018). It is seen that how many of the tribes come together - the arrow - takes that number in front of it. In this sense -arrow- is used in the sense of height. "Arrow and bow together -created in the sky like God- was the symbol of the khan, and he always had to dominate the peoples who used the bow, and with this symbol, he had to rule them in a traditional environment in a full and just way" (Öngel, 2001a). The homeland is established with the arrow in the family and is kept alive with the arrow. This understanding is supported by the fact that the married couples shoot arrows and build their homes and homes where the arrow fell. Again, swearing on the bow and arrow shows the sacredness of the bow and arrow. A Chinese traveler named Son-Wen used the following expressions for a sports festival held in Kivishka; "...whoever shoots an arrow at a small target placed on an atlas cloth, is declared the khan of that country for one day and temporarily gains all the rights of a khan for that day" (Tayga, 1990).

"In a document from the Crusades, the following is explained: - Each of the Turkish tribes brought an arrow to choose their chief, that is, their khan, and they chose the most noble among a hundred people. One hundred arrows gathered together in a tie. It is stated that they have agreed among themselves that a child will shoot one of these arrows and the chief will be chosen from the tribe whose name is written on the arrow" (Roux, 2001). The quiver (tirkeş) on which a bundle of arrows is placed is an important figure for the Northern Turkish-Mongolian communities. It suggests that there is a connection between the collecting power of the quiver, that is, the power to bring the tribes together, and being a state.

Festivities and festivals held in the fall are the most popular holidays. These festivals and celebrations coincide when the horses are at their strongest. Again, the Rite of the Sky is held in this period, where the most skillful archers compete with musical accompaniment. "The khan, who is considered to be the most skilled archer and the chief competitor at the highest level, was performing his duty as a kam, which expelled evil spirits by shooting arrows in four directions" (Öngel, 2001a).

These archery races and activities were the main motifs of the ritual. In another ritual, acts of expelling evil spirits were carried out by shooting arrows and lighting fire. "Altai shamans used to tell fortunes on the plateau and make it rain" (Öngel, 2001a). Shooting arrows into the sky is also a ritual act. "It is seen that throwing arrows and shouting at the sky are mostly done in lightning weather. It is much more likely that this custom was originally made instead of sending a message and a messenger to God" (Ögel, 1989). Since these non-periodic rites of shooting arrows into the sky are most likely performed irregularly, it may have a healing and purification quality. According to another view, there is a connection between shooting arrows into the sky and the tree of life. "They were shooting straight arrows at the universal tree with the belief of aiming at the sky" (Roux, 2001).

Side panels is an important figure associated with the belief system of shooting arrows into the sky in nomadic communities. The Turks; "They also associated the bow with the sky and believed that the bow was a symbol of the sky and the dome of the sky. Similarly, the Kyrgyz thought that the bow was held by the sunlight" (Berkli, 2007). "Shamans and khans held archery rites to make it rain, to reduce floods, and to keep enemies out of their pastures" (Selby, 1997;

Öngel, 2001b). Eagle feathers were used in the vest section of the arrows. “Because the eagle had a religious value due to its origin with shamans, it also had symbolic meanings” (Öngel, 2001b). Esin, 2001).

“Again, when the Chinese annals are examined, the “Ku” bow and the “curved” arrow were the ruler of the skies, “Tien”, that is, “as well as the sky god, it was the symbol of the power and sovereignty of the khan and khanate who had the sovereignty on earth” (Öngel, 2001b). Again, according to an old tradition, sacrifice and sacrificing in Turks contain very different behaviors. “Prof. Erkes; It indicates that horses and cattle sacrificed to the sky, earth and ancestors are not cut with a knife like other sacrificial animals, but are shot with arrows” (Öngel, 2001a). Much later, in the Ottoman period, we see that there were traditions such as drowning the descendants of the sultan with bow strings and not spilling blood. In addition, although the rituals of archery shooting are more common among the nomads, it should be considered natural that in the great Turkish geography, each Turkish tribes show different behaviors related to this ritual from time to time.

3. Structure of Springs

Works on the structure of Turkish traditional bows; Although it has a literature mainly from the Ottoman period, it is possible to find its traces in older Altai epics and tales. As described in Radlof's Altai tales called Kara Atlı Han (Martay Kara), "bow making is an important work and art among Turks. For this in the tale, the child falls into the mountains and catches seven deer goats and prepares the bow from their horns. The Turkish bow, which consists of horns, wood and nerves, was made by sticking them with fish glue” (Ögel, 1989). As described in the tale, the main materials used to create the Turkish bow are wood, horn, tendon fibers and the glue for bonding them. “Forty-three dirhams are taken from each of these four substances and they are prepared; dried; cleared; it opens into a ring; is put into grooming” (İrtem, 1939). Since one dirham is 2.97 grams, 43 dirhams equals approximately 128 grams. Unlike what is described in the tale, bringing these materials together and assembling them step by step was a delicate task, but it took months of time. The stronger the spring was to be manufactured, the longer it was necessary. “Şüca of Bursa has thrown the range of Yıldız at a weight of one hundred and seven dirhams in Istanbul, and İskender who has beaten the range of Edirne with a weight of one hundred and thirty dirhams” (İrtem, 1939). This shows that they used approximately 348 and 416 grams of bow.

Wood, which is one of the most basic materials in bow construction, is important in terms of not spoiling the bow quickly. There are such springs that they have been able to maintain their order for 200 years without breaking down. Maple is known as the most suitable tree for bow making. It is said that "the best bows are made from the maple tree grown in the town of Gerece" (İrtem, 1939). Because maple glue absorbs better than other woods. It is preferable that the tree is young. The tree that comes to the thickness of the wrist; It is cut from the knotless, unscathed area, half a cubit from the ground, that is, 30-35 centimeters above. After this stage, although today's practices are very different from each other, İrtem (1939) explains the processing of wood as follows: “Draft trees are placed in a cauldron, filled with cold water and left for three days; then this water is boiled in the fire until the trees become soft; The trees are removed and the sides that come to the bone are caught in the flame of sawdust.” Afterwards, each master is

left to rest on the condition that it is different, and the longer this period is, the better the bow will be from the tree.

Another material used in the bow is the horn. The horn is the material that adds a composite feature to the pedestrian and prevents the tree from breaking. The horns are thoroughly boiled and cleaned by pouring, or they are left suspended in dry air for about a year, waiting to fall out. Some cognacs also write that they should be buried under the ground and kept waiting. The important thing in these methods is to ensure that the horn does not lose its feature. The horns should be cut towards the bent side and the same side of both horns should be used. Otherwise, one side of the spring will remain hard or soft compared to the other side. This will disrupt the balance of the spring and the proportionality of the traction power. The cut horns are boiled in a cauldron until they become soft. When it is removed from the water, it is heated in the flame of shavings or pine wood; slowly corrected. It is laid in wooden molds narrow enough for the bone to fit in and compressed; until it cools down” (İrtem, 1939). In this way, the horns are made ready.

The third material that brings the spring into the body is the nerve, that is, the tendon. The tendon is found in the area from the hind feet of cattle, from the ankle to the next joint. This tendon is the longest tendon in the animal and is the most acceptable. After the tendon is thoroughly cleaned, it is dried and stored. When it is to be used, it is beaten with a wooden mallet and the fibers are opened by making it into a wire. It is applied to the part of the spring that will come out when stretched, using different amounts according to each master. It is necessary to stick a few rounds of tendons according to the weight of the bow, which is a masterwork and is not written in the sources.

The fourth material that keeps all these parts together is glue. We know from Radlof's work that fish glue was used. Much later written sources mention that "Çega Glue" produced in the Çega Village of Gelibolu was used during the Ottoman period, but that the organic fish glue was more effective. “Preparing the fish glue required patience and dexterity. It was made from the palate skin or air sac of the sturgeon cod, which lives in the places where the Danube, Dnieper and Volga rivers flow into the sea, with many varieties” (Göksu, 2018). The presence of different information in the literature should not be seen as inconsistent. Because each master embroiders his own style and experience on the pedestrian. Of course, all of them are trying to make the best and strongest bows. Because the springs are named after that master. “Especially range bows and bows that shoot darts have high traction. If we think that the density or content of the glue used by each master may be different, that the tendon fibers can be used in different amounts for each pound, and that all this is a skill of mastery, it should be natural that this information is not included in the sources” (Tuzcuoğulları, 2020b).

4. Bow Making

The preparation of the above-mentioned materials involves a long process. Now we will talk about how these materials are put together. Turkish traditional compound bow; It consists of five separate sections where three different materials are brought together. In general, all parts of the bow, except for the head, consist of these three materials: "tree, tendon and horn". Broadcasting; It consists of five parts consisting of the handle and raft sections on both sides, the head or end parts attached to the raft heads. These parts are added to each other as masculine

and feminine. When creating the arc parts, care should be taken to reassemble the single piece of wood from the places where it was divided. When the bow is set, the flat plated horn must be affixed to the inside and along the raft. In order to increase the bonding surface of the horn and wood, grooves must be made in both materials and these grooves must be adhered to each other while bonding. Gluing with this grooving method is an important process so that the tree does not leave horns.

When the spring is installed, the tendon is attached to the outer side and the part that runs along the raft. As for how the tendon is prepared, it was mentioned above. These tendons, which are made into fibers, are adhered to the raft with glue, provided that they are of the same weight. After one layer is adhered, it is slightly bent inwards, tied and left to dry for three months. This process is repeated according to the strength and desire of the warrior who will use the bow. A rest period of about three months is required between each coat. During this period, the spring is tied by the tendon by bending a little more each time and kept suspended in a moisture-free, dry environment. This process is repeated every three months, depending on the desired pound. Finally, the spring is kept in a suitable environment for a year and then, if desired, it is strengthened by wrapping it with leather, thus it is protected against external factors. This process is a precaution so that the spring does not deteriorate in rainy weather and its parts are not thrown out.

5. Aerodynamic Structure of Springs

Although the bows have been carried to the present day in a customary structure since the Old Turks, we see from the sources that they diversified during the Ottoman period. When we take Süleyman Kani İrtem's "Turkish Kemaneş" as a reference, we can talk about three types of bows as "Peşrev, Haki and Puta". Some sources also mention "Darp, Tirkeş, Çaka" bows, which are actually Puta (i.e. war) bows classified by İrtem.

The most important feature of Turkish bows is that they are reverse twisted. The tension created by the reverse twist creates a tremendous energy and allows a powerful flight by pushing this arrow. "When the bow string is stretched, the muscle energy of the archer is stored as potential energy in the bent bow, and when the bow string is released, the stored energy turns into the kinetic energy of the arrow" (Bir et al, 2006). That is, the object has an energy with acceleration due to the movement it has made. "Here, the section where the energy is stored is the "safe" section. There is a structural difference between raft and safe. It is certain that the raft section is both flexible and strong. Reverse resistance in the spring between the raft section and the casing; It is due to the fact that the raft is flexible and the casing part has a rigid body thickness, which is the part where energy accumulates and the tension reaches the highest point" (Tuzcuoğulları, 2020b). The tendon fibers remaining on the outer part of the spring now press on the contracting part, thanks to the tension, and this energy is created. The moment the beam is released, the spring acts to return to its pre-establishment form.

"The aerodynamic structure of Turkish bows, which take names such as composite, compound, reflex, was perhaps created after centuries of practice. It can be seen that the range of Turkish bows draws attention in the world as much as their structure. The range, which reached 845 meters in the Ottoman Period, attracted the attention of the whole world and prompted people to research the structure of these springs" (Tuzcuoğulları, 2020b).

6. Structure of Arrows and Making Arrows

As there are differences in bows, there are structural features that distinguish arrows from each other. Arrows differ according to their intended use. The arrows used in war and the arrows used in target shooting (puta, basket) and the arrows used in range shooting are structurally very different from each other. “Altai blacksmiths made arrowheads from high-quality iron” (Gumilov, 1999). While the range arrows are preferred light and relentless, the combat and battered arrows are metal tip and have a triangular structure. If we look at the much later (Ottoman period) sources, the arrows can be classified as: “Tirkeş, Talim, Puta, Menzil, İdman and Meşk. These arrow types are: Pişrev (Yeksüvar), Zergerdan, Karabatak, Khaki, Azmaış, Puta, İbriş, Torba Gezi (Talimhane Arrow), Air Gezi, Çarh Arrow, Beech Arrow. It is possible to call it as Accident Arrow, Slingshot Arrow, Sergeant Arrow (Buzzing arrow, whistling arrow), Mint Arrow, Fire Arrow” (Tuzcuoğulları, 2020a).

Let's explain these types of arrows according to their intended use. Pişrev; It is a very light range arrow made from reeds up to a period. Temreni are usually sharpened or made of bone. “Zergerdan; range is an arrow, it is a gold wire wrapping around the throat of the arrow, which is the insignia of its master” (Pakalın, 1972; Yönel & Türkmen, 2017; Yücel, 1971). Azmaış arrow is range arrow. It is a type of arrow used in training. Puta; bony mark arrow. “Puta and Azmaış arrows are arrows used for trial and training. The aimboard, which serves as a target in group shots, is also called Puta. This shot is called the Puta shot. This target can sometimes be baskets, bundles or eggs” (Köseoğlu, 1952). read khaki; It is another range arrow, naturally only used in long shots, the vest part is depressed arrows. read cormorant; This is also a range arrow, but cormorant feathers are used in the vest part. It takes its name from here. “İbriş; (ebruveş) range arrow. It states that it is obtained by hitting the old idol and khaki arrows with a needle vest so that the training is not stopped. Bag Travel; The work used in shooting is the arrow” (Pakalın, 1972; Yönel & Türkmen, 2017; Yücel, 1971).

“Air Excursion; This arrow, which is used in training for range shooting, has no spine or vest” (Ayanoğlu, 1974; Yönel & Türkmen, 2017). Cross Arrow; It's a war arrow. Therefore, the temreni is made of iron and its length is short like other Turkish arrows. Beech Arrow; It is made of beech wood, hence its name. Although there is no clear information about this arrow, there are differences between the temren and the vest. Sergeant Read; It is used to show targets in range shooting and wars. These arrows, which started to be used in the old Turks since the Mete Han period; Functions such as communication, frightening and guiding (directing) gave the warriors privilege. Of course, this situation facilitated communication between the warriors, and was sometimes used to psychologically influence the enemy” (Tuzcuoğulları, 2020c).

Due to the chambered construction of the temren part or the fact that it buzzed while flying in the air due to the notches opened on the temren, it was also named as buzzing arrows, whistling arrows. Fire Arrow; They are arrows used for burning vehicles in the sea. Again, they are arrows used to start a fire by throwing into the walls during castle sieges. Structurally, the stem part is marsupial. Mint Arrow; Used in battles and combat training. The spines of these arrows are made of metal. It is used in wars to pierce enemy armor made of metal. Slingshot Arrow; It is thought to have been used in hunting. The temren part is flat and sharpened by carving. It is used in fishing.

There is no clear value in the sources regarding the length of the arrows. This may be due to the fact that the springs are custom-made. According to Öngel, the length of the arrow was adjusted according to the user; “The length from the middle of the throat to the tip of the index finger is measured, and by adding a factor of safety of three or seven centimeters to this length, the ideal arrow size for an archer would be found” (Öngel, 2001b). İrtəm (1939) mentions that Bursalı Şuca uses 10 tufts and 2 finger bows, while violinist Mustafa Sergeant uses 9 tufts and 1 finger bow. He says that arrows can extend up to 8-9 handles. “Turkish arrows are the shortest (0.7 m) and light (10-18 gr) arrows known” (Bir, Kaçar and Acar, 2006).

“Arrows were made of beech-birch (it is thought that the beech tree mentioned in ancient sources was actually birch), pine wood and reed” (Tuzcuoğulları, 2020a). It is known that later it was made only from pine wood. “The ala of the pine was in Kazdağı in Bayramiç. In that vicinity, the people of Çavuşlar Village were familiar with cutting the best arrow tree from Üçler Mountain” (İrtəm, 1938). After the branches cut from the pine were turned into reeds, they were hardened by rolling them on the hot sand. Depending on the purpose of use, the temren part was either chipped and sharpened or metal tips were attached. “The ends of the war arrows are iron; The ends of the range, buta and minted arrows are made of iron, ivory or carob” (Kahraman, 1995).

“Ottoman archers generally used 6 types of temren. One variety is called flat. A triangular type is used against enemies or game animals. One type is called Zeytuni and is attached to puta and Azmaış arrows. The tip is not sharp. One of them is called Almost, the bag is attached to the travel arrows” (Kahraman, 1995; Yönel & Türkmen, 2017). When looking at the ancient arrow fragments (Istanbul Military Museum), one can see triangular or hook-shaped thorns towards the body. It is probable that these temrens belong to the arrows used in the war. It wouldn't make sense to use these arrows in hunting or sport archery. “The blades of war arrows are sharpened like knives and water is given to swords just as water is given to them and they are turned into steel” (Yönel and Türkmen, 2017). “If the steel is given too little water, the temper will bend easily, and if too much water is given, it will become brittle. Quenching recipes are the secret of the masters” (Acar, 2013).

We see that arrows were named in four parts during the Ottoman period. These are: hindsight – vest – body and temptress. Travel: It is the part of the arrow that has a triangular slot placed on the beam. "Waistcoat; It is the name given to the feathers attached to the back of the arrow so that it does not miss its target when it is thrown and does not exceed the target” (İnan, 1943). Body; The parts are named after the human body. “The body of the arrows is in the structures of Şem Endam, Tarz-ı Hasve Kiriş Endam. If we open them; Şem Endam: Its body is wide and it has a structure that tapers towards temren and gaze. It is similar in structure to wax. Style-i Has: It has a structure that tapers towards the hindquarters while the hindquarters and body are of the same thickness. Kiriş Endam: It has a structure that gets thicker from temre to Gezi” (Tuzcuoğulları, 2020a). The size of the arrow as a whole is examined in 24 parts. “From the ankle notch, the first 4 parts are called the head, the navel instead of the throat 10.5-11 parts at the end of the head, the chest between the throat and the navel, the calf from the navel to the 17th part, and the foot from the calf to the tip, that is, between 17-24 parts” (Yücel, 1971).

“Some wrestlers were very careful and finicky in the choice of arrows, they used arrows cut from the part of the tree that came into the air they would shoot at the range with whatever air

they would shoot” (İrtem, 1938). We can see the precision of wrestlers and bow masters in making bows and arrows.

In the workshops where bows and arrows are made, the existence of rules such as not cooking oily food in order not to penetrate the bows made shows the sensitivity on this issue. As a result, the Turks were a skilful nation in archery. For this reason, they were called "bowling tribes" and "archer nation" by other nations. Being able to use the most effective weapon of the period on a horse gave the Turks great advantages. Their horses were as agile as their bows. Using both of these skillfully, the Turks ruled from the Asian steppes to Eastern Europe for centuries.

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