

**ИСТОРИЧЕСКОЕ  
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**Dr. Manouchehr Moshtagh Khorasani and Bede Dwyer**

**An annotated translation and description  
of an untitled Persian archery manuscript  
written by al-Abdolrāji Abu Torāb al-Musavi al-Qad Makāhi  
on a day of Jumada al-Thani, the year 1114 (November 1702)**

*The present article provides a translated and annotated text of a Persian archery manuscript. This untitled manuscript on archery is kept in the Majlis Library (Library of Iranian Parliament; Ketābkhāne-ye Majles Irān) with the inventory number 149. It consists of 43 pages. The author of the archery manuscript signs his name at the end of the text as al-Abdolrāji Abu Torāb al-Musavi al-Qad Makāhi and dates it to Jumada al-Thani, the year 1114, which is November 1702 in Gregorian calendar. There is no further information about the author of the archery manuscript. The manuscript consists of twelve chapters and a conclusion. In the first chapter, the author gives background information on the bow and arrows and stresses its superiority compared to other weapons. The second chapter is about the archers and bow owners, namely people who used the bows to shoot. The third chapter provides essential information on the terminology of the bow. The fourth chapter is equally important as it deals with having the right bow and equipment and shooting at the practice target. This chapter also explains how to make the practice target and how to shoot at it. The fifth chapter describes different types of weapons and compares the bow to them. The sixth chapter describes in detail different standing methods in Persian archery. The seventh chapter is also important as it describes different methods of "grasping the bow grip". This is one of the most detailed descriptions found in any Persian archery manuscript encountered by the authors of the article. The eighth chapter is about nocking the arrow. The ninth*

*chapter deals with the technique of the "thumb draw" and provides essential information on this technique. Equally important is the tenth chapter which deals with drawing techniques. The eleventh chapter provides important information about different styles of aiming. The twelfth chapter is about drawing and releasing. Finally the manuscript closes with a conclusion describing the flight archery and knowing the distance to the target. The authors of the present article have translated and annotated a number of Persian archery manuscripts, which had been unknown before, and presented them to the scientific community. These include: a) A Persian Archery Manual by Mohammad Zamān (see Moshtagh Khorasani and Dwyer, 2016, pp. 45-65), b) Resāle-ye Qosnāmeḥ (see Dwyer and Moshtagh Khorasani, 2015, pp. 93-116), c) An Analysis of a Persian Archery Manuscript by Kapur Čand (Dwyer and Moshtagh Khorasani, 2013, pp. 1-12), d) A Persian Manuscript on Archery, Spear Fighting, Sword Tempering and Lance Fighting and Horsemanship by Šarīf Mohammad the Son of Ahmad Mehdi (see Moshtagh Khorasani and Dwyer, 2012, pp. 1-17) and e) Jāme al-Hadāyat Fi Elm al-Romāyat [Complete Guide Concerning the Science of Archery] (Dwyer and Moshtagh Khorasani, 2012, pp. 45-60). Compared to all the manuscripts mentioned before the Persian archery manuscript written by al-Abdolrāji Abu Torāb al-Musavi al-Qad Makāhi provides the most practical advice on archery techniques which has been presented in any analyzed Persian archery manuscript.*

*Keywords: Archery, Persian archery, different parts of the bow, archery techniques, composite bow*

## **1. Introduction**

This manuscript starts with a unique story about the origins of the bow, relating it to a female servant of the Iranian culture hero, Jamshid, and proceeds to put the bow firmly in the context of legend and history. Not only is it positively associated with Iran, but a strong connection is made with the Prophet Mohammad and his Family and Companions. The reverence for the Ali is emphasized by the place given to his archery skills in comparison to the famous Arab archer, Sa'd ibn

Waqqās, though the rivalry is friendly. Having tied together these various threads, the author proceeds to the practical description of equipment and shooting.

The terminology used by archers to describe the various parts of the bow is presented in detail and this is a valuable contribution to our knowledge of Persian archery. Terminology has a tendency to change over time and the frequent quoting of older sources often makes it difficult to tell whether a term is contemporary or historic. The arrow is not treated with such detail and some terms are introduced as a side effect of describing the bow. The practice target is introduced as an essential part of training and its construction is explained. The similarity to the Turkish torba target and the Japanese makiwara is obvious and the purpose is the same. Building up a consistent shooting style though constant practice is emphasized.

The types of target shooting proceed from the more familiar to modern archers to the extreme where the distances are beyond even modern Korean practice. Long distance targets are differentiated and ranges are given. Though the size and the nature of the targets are not described, other manuscripts and similar Ottoman ranges provide some idea. That shooting at extreme distances was normal is corroborated by the reference to English archers in Shakespeare's *Henry IV* where it is said of Old Double that "He would have clapped i' the clout at twelve score". Twelve score yards are 240 yards or 219 meters. Modern target ranges extend to 90 meters in Olympic competition and 140 meters in traditional Korean target archery. The implication that can be drawn from this is that the bows were capable of consistently shooting an arrow to the distances suggested and that the archers could achieve some level of accuracy at these ranges.

Flight shooting is another discipline that is covered in some detail. It is seen as "professional shooting" and the most challenging sport. This is parallel to the contemporary Ottoman attitude and shows that there was a shared culture of careful and precise measuring of long distance shots.

The detailed and careful description of the shooting method is useful to the historian and the contemporary archer interested in these techniques. The opinions of the author are of a competent practitioner who is not shy about reporting his triumphs. This manuscript has a rare account of some who used the most difficult

over-draw technique where an arrow is drawn inside the bow using only the base of the thumb as a support.

## **2. The manuscript**

One day Jamshid was sleeping. A bondmaid was assigned to whisk the flies. His Excellency who is capable of doing everything gave her a divine inspiration and revealed to her to take a small piece of wood, to take some hair from her head, to twist them together, to tie them to the one end of the wooden piece, to bend the wood, and to tie the twisted hair to the other end of the wooden piece. Then it was revealed to her to take a thinner piece of wood, and like an arrow attach it to the twisted hair, pull it and release it. With the will of God the wooden arrow flew and landed straight. He woke up and saw that bow in the hands of the bondmaid. He ordered a bow made of iron. But when they strung it and pulled it, the bow did not bend. Then he ordered to make a bow made of wood. But it was weak and without power. Then he ordered a bow made of horn, but when they strung it and pulled the bow, it broke. Then he ordered to make a bow made of wood, horn, tendon and natural glue. They had it dry under the sunlight and became a circle. However, no matter how much they tried to string it, they did not succeed. It is said that no matter what kind of profession Jamshid took up he would spend fifty years to master it. It is said that Jamshid attempted to learn the profession of bow making but could not string the bow for fifty years. One day they made a fire in front of Jamshid, he was disappointed and threw the bow in fire. As soon as the bow warmed up it started to move. He understood instinctively that the master of that craft was fire. Then again based on the knowledge, he warmed the bow, bent it and strung it. After he pulled it, it came back to its original position and stayed there. From the period of Jamshid up to then many changes were made to the bow so that it reached a level that no further changes were necessary regarding its shape, elegance, power and . . . . . Another tale says that Adam, peace be upon him, conveyed it to his children and from them it was inherited from one dynasty to the next until it reached the last of the prophets [prophet Mohammad], greetings be upon him and his family, and he bequeathed it to the king of brave men, the lion of God, the victorious leader of the believers, Ali the son of Tāleb.

**First chapter: About the superiority of the bow and arrow.**

You should know that the superior characteristics of the bow are too many to fit in this short report. Some of them will be explained in a short manner. Based on the tradition descended from the Prophet, each time they make an arrow, three people go to heaven: first the person who makes the wooden shaft of the arrow, second the person who hands in the arrow to be shot for the way of God and third the person who shoots the arrow at infidels in the way of God. It is reported from Imam Ja'far Sādeq, the Peace of God be upon him and his family, who said that the messenger of God, the Peace of God be upon him and his family, in interpreting the verse "Prepare against them whatever arms and cavalry you can muster" stressed the power of archery. So in this noble verse archery is a must and learning this respected art is a requirement and a necessity. In the narration of the prophet it is reported that nothing is important than archery and riding. The Excellency leader of the believers, the Peace of God be upon him and his family, stated that ... archery, writing and swimming should be taught to the young so that they become complete. He also stated that in any house where there is a Qur'an every day, a reward of one prayer is ascribed to the owner of the house. He further stated that if there is a bow and arrows in a house, a reward of one prayer is ascribed to the owner of the house because, by listening to the words of God, the infidels will not become Muslims, but, because of fear of the bow and arrows, the majority of the infidels became Muslims. Satan, be he damned, does not pass a house where a bow and arrows are kept. During the period of the Lord of creation and the master of creatures [the Prophet], the Peace of God be upon him and his family, there were just short of seven thousand archers and among them there were seventeen who were perfect shooters and among these seventeen, seven were remarkable and respected: first Mohammad Salim Nokte Ilāhi, second Ālamšāh Rumi, third Ali Xān Tabrizi, fourth Seyyed Ali Xorāsāni, fifth Mohammad Rezā Xārazmi, sixth Darviš Ali Ušjāni, seventh Ahmad Torkestāni, It is well known that among the pioneers [the original follows of the Prophet] and ..... with the exception of His Excellency, the Leader of the Believers, the Peace of God be upon him and his family, no one had shot an arrow better than these seven archers. They always shot in front of the Messenger, the Peace of God be upon him and his family. And the Messenger kept



saying that they should collect their arrows barefoot saying that on a ground where they shoot arrows, the quality and value of it is like the ground of paradise. It is also said that on each place where they make a mosque where the lovers of God pray its ground will be more valuable than the other places for forty years. On each ground, where the Arabs who follow the righteous way shoot with a bow, the ground will be more valuable for seventy years. In front of me a group of Arabs following the righteous way so that the intelligent people can recognize the intention of these narrations which reveal the advantage of archery. In the books of narration [attributed to the Messenger], the advantage of archery is often emphasized.

**Second chapter: About the arrow and the archers and bow owners.**

What you should know what is the bow, who are the archers and who are the bow owners. You should know that the bow descended from heaven to the Hazrat-e Adam, the Pious of God. Gabriel taught that Highness. If they ask you where Gabriel learned, this art say he learned it from a secret tablet where it was stated that the archer was a science meant to be taught to Adam. Adam taught it to his children, and they handed it down from one dynasty to the other until it was given to the Seyyed and Master of creatures Mohammad the Chosen and he handed it down to the King of Trusteeship, the leader of the believers, Ali the son of Talib. It ended there as he is more illuminating than the sun. From the period of Adam until this period and after this period no one has ever shot an arrow nor wielded a sword and will ever shoot an arrow nor wield a sword as the king of men and the lion of God, the leader of believers, the Peace of God be upon him, does. So the owner of both weapons is his Excellency. There is a famous story that one night Sa'd ibn Waqqās came to his Excellency the leader of believers, the peace of God be upon him, and claimed no one in that period could shoot an arrow as well he could. His Excellency said, "Sa'd, as you are boasting, I will go and shoot with you". During the night, they set out a bowl and ordered a person to strike it with a piece of wood at the distance of one arrow [the length of an arrow between the striker and the bowl] so that Sa'd could hear the sound to locate the bowl. He ordered Sa'd to shoot in the name of God. Sa'd shot three arrows and one of them penetrated the bowl and went through it. The leader of believers, the Peace of God upon him, also shot three ar-

rows and from them one of them penetrated the bowl and went through it. Sa'd said, "Oh Ali, we reached the same and failed two arrows each." His Excellency said, "We have to go and look at the bowl". Two arrows of Sa'd had failed to strike the bowl. But the arrow of his Excellency, which penetrated and pierced the bowl, left a hole and his two other arrows also went through the same hole and landed on the arrow nocks of the others. Sa'd said, "Oh Ali, I have made a mistake both in talking and in shooting".

The owners of the bow shoot with techniques and principles. When they start with shooting, first they ask for the help of the creator of all creatures and Mo-hammad the Chosen, the Peace of God be upon him and his family, the experienced archer and the owner of the bow, and say the prayer for the forgiveness of the dead. Then they say "God is great" for the masters, whose respected names have been mentioned before, and start with the shooting.

### **Third chapter: Knowing about the terminology of the bow**

From the tail of the nock to the middle of the bow grip which is called beren-jak [the belly side, the piece of horn or bone inserted between the two strips of horn on the belly of a composite bow], each part of a bow has a name. The masters call a bow with different names and know how to describe an arrow and where is the head of a bow and the head of an arrow. Thus archers should know all names so that they can be called an "expert of the bow". You should know that the masters describe a bow with four different names: qabze (bow grip), halqe (ring), helāl (crescent) and dāyere (circle). First when the masters make a bow they call it a "bow grip" Second when it is finished and curled, it is called a ring. Third when they string it, they call it a crescent. Fourth when they pull it, they call it a circle. The masters also call a target dāyere (circle). They call an arrow the point in the middle circle and when the arrow hits the target, it resembles a point. If they ask you where is the "bow head", you should say it is where the arrow passes. They should recognize the head of the arrow so that when they shoot, it lands straight on the target or ground, in case the head of the arrow is the nock.

The masters use fourteen terms to describe different parts of a bow from the tail of the nock to the middle of the bow grip. First, the end of the bow is called

zāq. Second the opening where the triple-loop is placed is called "slot" [bow nock]. Third from the slot to the place where the triple-loop knot rests is called guše. Fourth, the place where the "triple-loop knot" rests is called čakāve or čakāvegāh. Fifth, the area below the "triple-loop knot" is called gerehgāh. Sixth the thing which gets out of the tail of gerehgāh is called toligāh [this is the place where the arrow tang attaches to the shaft]. Seventh from čakāve to the place of where is a bend is called banāguš. Eighth the place where there is a bend is called breast. Ninth, where there is a davr is called "half of the bowarm". Tenth close to the bow grip is called coffer. Eleventh . . . is called šafi'. Twelfth the back behind the bow grip is called kafāf. Thirteenth, the place in the middle of the bow grip between "the horn of the wood" and the horn which attaches is called berenjāk. Fourteenth, the place which is held in the hand is called "bow grip".

[This is an important and detailed list of the names of sections of the bow. The zaq is the same word used in Turkish, zağ, for the nock covering. Our text differentiates this from the nock, faraje, which might imply a clear distinction between the slot and anything above or covering it. The use of xāne as the name of the bow limb is parallel to the Arabic بيت (bayt), or house. The reason why it is used for the curved limb of a bow is because it is an astronomical reference. A house is a segment of the circle of the sky. The toligāh is the place where the ear is spliced into the limb of the bow. This is not visible because it is covered by sinew and horn. It is like where the tang of the arrowhead is glued into the shaft of the arrow. The breast or chest of the bow is the curve in the limb of a strung bow at the base of the ear. This varies between designs of bows. In Arabic, it is called the elbow, demonstrating that while both traditions used anatomical metaphors in naming the bow, they differed in their choice of body parts. The šafi' or mediator is the transition between the coffer and the grip. This might mean the transition between the elliptical cross section of the bending section of the arm and the grip with its more tear drop shaped cross section. The kafāf is the equivalent of the Arabic term متن (matn), which is the ridge of the back of the handle of the bow used to control how the bow is angled in the grasp of the hand].

**Fourth chapter: About having the right bow and equipment and shooting at the practice target**

First the archer should have the right bow and equipment so that before starting the archery, they do not lose face in front of competitors and self-proclaimed expert. They should know which type of arrow should be shot with which type of bow for what type of distance. Masters have said that they should make the distant targets close in the desert and make the close target on the wall far. They should use to hit the target at the feet and on the vault in fifty steps with a bow of 14.2 and an arrow of 9.2 and not stronger and longer than that. They can also shoot the distance of a hundred to two hundred steps also with a bow of 14.2. They can should the distance of three hundred to four hundred steps with a bow of 13.2 and a medium-sized tir-e xāki of 8.2. They should the distance of five hundred to six hundred to seven hundred steps with a bow of 12.2 and a tir-e xāki of 8. The length of the "flight shooting bow" is between 12.1 and 12 minus one. Next they should not shoot a narrow arrow with a "bow with long limbs" and they should not should a thick arrow with a weak "bow with short limbs". They should also know the way the arrow flies by shooting the bow. They place the nock on the "center of the bowstring" and hold the bow grip, and hold the arrow at the end close to the feathers which is made of horn and called šafi'.and places it on the "slot" [bow nock] where the triple-loop is positioned. If the other end of the arrow where the arrowhead is attached to the wooden shaft reaches the middle of the bow grip, which is called berenjak, the length of the arrow fits the length of the bow. If it is longer or shorter, the arrow is longer or shorter. If the bowstring is long, the length of the arrow is too long. If the bowstring is short, the arrow is shorter than the length of the bow. The bowstring and the triple-loop should also be in accordance with the power of the bow. So they are not long nor short neither thick nor thin.

**Making the practice target:**

The masters of light archery shoot a lot at a practice target. Shooting at a practice target is very good for beginners and non-beginners.

**The way of making the practice target and shooting at it.**

They make a rounded wooden practice target with a length of a long arrow and place it with the height of a human being on a wall or hang it, at the same height, from its width. Flight archers also hang it higher. They use unfletched arrows and a bow with a force according to the power of the archer. They stand a bit away from the practice target using a method, which as God wills, will be explained in the chapters on the methods of standing, holding the bow grip, drawing and releasing and other things. They make each one of them their priority and shoot at the practice target so that they learn all principles and methods of archery. Each day they use a stronger bow compared to the day before so that they increase their power. You should know that the principles of the art of archery are based on four columns. First shooting at practice targets is the feature of the guards because the principles of most important things should be learned from police officers. The principles, rules and customs of archery can be learned by shooting at practice targets. Second "target shooting" and this is attributed to the practice of a judge as the truth and the lies of two claimants are revealed in a religious court and "shooting at slanted angle" of archers are revealed by target shooting. Third shooting at a bush : after shooting at a target is learned, they should shoot at a bush in the desert. As a bush is further away than a target, the level of shooting at a bush is higher than target shooting and is considered as a higher level. Fourth, flight shooting: after they shoot at a bush at four hundred and five hundred steps in a straight, professional and impressive way, they should learn flight shooting. Because in the art of archery, the flight shooting is the highest level, this art is compared to the art of the kings. This art will be explained at the end.

**Fifth chapter: About the types of weapons**

One should know that there are five types of grips which were descended from heaven. As mentioned before Adam, [greetings] peace be upon him, when coming out of heaven, God ordered him to be involved in agriculture and farming: Gabriel, greetings be upon him and brought the ploughshare so that he could plough the field and plant seeds. The wooden handle on the ploughshare which is used for ploughing the field is the first grip [weapon] [This might be part of a Sufi system of

passing on the grip, each representing a secret or special knowledge]. Another time when his Excellency Adam, Peace be upon him, who had planted seeds and when they grew to panicles, ravens came and ate them. No matter where Adam went to scare the ravens off, they landed on the other side of the field. Adam, Peace be upon him, cried, "Oh God I am sick and tired of ravens". Gabriel, Peace be upon him, brought a bow and three arrows from heaven's arsenal so that he could defend his field against the ravens. This is the second grip. After the crops of Adam, Peace be upon him, were ripe, he did not know how to cut them so Gabriel, Peace be upon him, appeared and gave him a sickle to cut and harvest. He taught his Excellency Adam two methods of harvesting and this is the third grip. The fourth grip is the staff of Moses, which was handed down by his Excellency Jethro [the father-in-law of Moses] to Moses. The explanation of this tale is available in the religious commentaries. The fifth one is zolfaqār who was handed down during the period of his Excellency, the Messenger, Mohammad, the Chosen one for the king of men, to the leader of believers, Ali the son of Talib, Peace of God upon him and thus it (the sequence of grips) ended with zolfaqār.

#### **Sixth chapter: About standing**

There are three types: First the right, second twisted, third "shooting straight". They use each one of these in its own place. This method is used for shooting at the practice target and shooting at the roof. The way of standing the right method is that they put the wrist of the bow hand in line with the target and raise the heel of the foot at the same side. They plant the foot of the leg on the side of the arrow hand on the ground and trust the measurement with the arrow hand. The heel of the bow hand is parallel to the foot of the leg of the arrow hand. Between two legs, they take a mar'i step and some masters take even larger steps. However, in flight shooting, the closer the legs are to each other, the better it is which will be explained in its own place. In target shooting and roof shooting, they shoot not be standing so much in the "right" position. The second method is twisted which is used for shooting at the bush and "long-range target". The legs should be placed as mentioned before. The bow hand and the same side of the body should be placed in line of the target in a way that if someone is standing on top of the bush, he cannot

see the archer's chest [This is like the Arabic oblique stance, but with the feet in a different position. It is clear that the author could divorce the position of the legs from the attitude of the upper body. By twisting at the waist to align the shoulders with the line to the target, the archer has a much stronger and longer draw]. The advantage of getting acquainted with the twisted stance is that, if an archer is facing the enemy one day, his chest will be hidden from the enemy. The third method is shooting straight which is used in flight shooting. They stand in front of the place where they want to shoot at and place both legs close to each other. Standing straight this way makes one taller than when they make one step between the two legs. Being tall is important in flight archery so that flight archers put three pieces of leather in their shoes so that they are taller and they can shoot longer distances. If two people are competitors during flight shooting match, they should search for such things [These three stances, while similar to the ones in Arabic and Turkish manuals, are unique in the way they are described. The idea that the distance between the legs of the archer affects his height is a unique way of looking at stance. While the idea of twisting at the waist to turn a square stance into an oblique one is used in Korean archery, this is the clearest expression of the idea in Middle Eastern archery literature. Whether the heel of the hand means the heel of the palm of the hand or the wrist is arguable].

#### **Seventh chapter: About the methods of "grasping the bow grip"**

There are three types: "grasp of lion's head" which is also called "the grasp of Bahrām". All masters learned the method of grasping the bow from Bahrām and the best methods of grasping the bow are the grasp of Bahrām, the square grasp, the "palmar surface" grasp. The way of the grasp of lion's head is when the archer grasps the bow, they first look at the bow ear and bow arm and place the more powerful bow arm down and the bow arm which takes the arrow on top. [This is standard practice. The stiffer bow limb is usually the lower one and can be seen because the upper limb bends slightly more. With a symmetrical composite bow, after it is strung, one limb will bend slightly more than the other so it is chosen as the upper limb]. The ear of the upper limb (bow arm) tends towards the bow grip. Upon drawing and releasing the bow, the bow throws off the bowstring and the

hand loses the bow resulting in the breakage of the bow ear or the "bow chest". [I think the author is referring to what happens when the string comes off one limb of an unbalanced bow.] They place the "lower nock" facing the heel of the hand grasping the bow. They lift the heel of the left foot and place the weight on the ball of the foot. Then they wrap the middle finger, ring finger and small finger around the bow grip and grasp the back of the bow grip between the flesh of the palm of the hand and the base of phalanxes. Then they bend the index finger and place the tip of it on back of the bow grip. Further, they position the thumb on the middle, ring and small fingers in a way that the middle of the hand is empty so that if, for example, they placed a dove's egg there, it would not be damaged. The top of the bone of the bow hand should not be placed on berenjok and the bow grip. They should hold the bow grip between the index finger and the thumb. [This is the classic *čangal-e baz*, much loved by Persian archers. However, the side of the back of the grip should be against the proximal crease of the fingers. Slight imprecision in describing these precise positions is occasionally present and may be the result of the copyist dropping a word]. In the "square grasp" is done similar to the "grasp of lion's head" as mentioned before, but in the square grasp, they place the index finger also around the bow grip to make a square. The difference between the grasp of lion's head and the square grasp is that the grasp of lion's head has openness and the square grasp does not. [The index finger probably touches the thumb to form a guide for the arrow]. For weak and powerless people, the square grasp is better. The square grasp is better than the grasp of lion's head. The "heel grasp" consists of placing the "breast of the bow hand" and the top of the bone of the forearm on the bow grip and berenjok. [This grasp appears to be very like the typical grasp of the longbow archer. The base of the palm is used to support the belly of the grip of the bow. Typically it shortens the draw and causes the arrow to be slightly elevated]. You should know that none of masters and archers like this type of grasp and the masters consider placing the palm of the hand on the bow grip a complete mistake. It has couple of deficiencies. First the support of the arrow will be flattened and the arrow cannot be drawn properly. Second, the archer using the heel [grasp] intending to shoot the arrow from the support will strike the support with the arrowhead. Surely, in this grasp they pull the arrow two fingers less than the archer using the



grasp of lion's head. The reason is that each time the chest of the bow hand is placed on the bow grip, the hand grasping the bow grip is shortened by two fingers and the column [the arm holding the bow] is also bent. It could also lead to badarqe [This could mean the arrowhead falling off the hand]. In short none of the masters and archers like this type of bow grasping.

**Eight chapter: About nocking the arrow**

After having learned different methods of grasping the bow, one should learn the science of nocking the arrow. There are two methods: "like a spear" and "like a pen". The spear method is that they hold the arrow like a spear and place the arrowhead in front and strike "place where the arrow tang is attached to the shaft" on the bow grip. They should hold the bow grip with the index and middle fingers so that the arrow is placed on the thumb of the hand grasping the bow. The reason for striking the arrow on the bow grip is that if the arrow is broken its sound reveals it. Especially if the arrow shaft is made of cane, they should really remember this. From the place, where they attach the arrow to the bow grip, they keep the "arrow nock" between the finger tips of the thumb and the index finger placing the arrow on the fingers holding the bow grip. Then they place the arrow nock on the bowstring attaching it to the center of the bowstring by holding it on top of the thumb. In the beginning, this was already mentioned and is an important principle of archery. The center of the bowstring should be at the same level as the intermediary [middle of the bow grip] and should not be higher or lower. If it is higher, the arrow tends to go down fast. If it is lower, the feathers of the arrow would strike the plank and damage it. The method of like a pen consists of holding the arrow like a pen and attaching it to the center of the bowstring similarly to the "like a spear" method. Using this method, in attaching the arrow to the bow grip, if they turn the arrow and attach it, it is better. The meaning of turning the arrow in front of the competitors and pretenders is boasting and bragging. If they use both methods quickly and dexterously, they are both good methods. But in the opinion of this poor self, spear-like method is better than the pen-like method. They should hold the arrow between the index and middle fingers of the bow grip to attach the arrow nock to the center of the bowstring. The center of the bowstring is the place where

the bowstring is attached to the arrow nock. After the arrow is attached, with the index and middle fingers holding the arrow, they push the arrow so they can hold the thumb properly. Because if upon drawing the bow sometimes the arrow nock gets empty and in drawing, the bowstring strikes the "side of the nock of the arrow", breaks the sides of the arrow nock which are called dank and injures the bow hand. It also shakes the arrow, separates the bow grip from the hand and breaks the bow [This means the arrow nock starts to slip off the string and when the latter is released it strikes the inside of the side of the nock, fracturing it. The consequences can include a "dry fire" where the bowstring completely leaves the arrow and the full energy of the bow is confined between the string and the bow, often damaging the structure of the bow].

#### **Ninth chapter: About the technique of the "thumb draw"**

The main principle of archery is the thumb draw, draw slowly and release. The principle of the thumb draw is that after they attach the arrow nock to the bowstring, the middle finger, the small finger, and the ring finger and the thumb should be closed so tightly that even if there is a "cumin seed" between the fingers, it does not fall down during the thumb draw. This [these three fingers in this position] is called the seat. Then they place the tip of the index finger on the seat in a slanted position so that the distal phalanx of the thumb is placed on top of the intermediate phalanx of the middle finger. The index finger should be placed around the thumb in a way that the nail of the thumb remains visible. The tip the thumb should not extend through the index and middle fingers which would be a big mistake [What this means is that the thumb is bent enough that its tip is not exposed. Two things can go wrong at this stage: the thumb can slide up the middle phalanx of the middle finger and lose firm contact or it can lift off the middle finger. Both actions weaken the thumb draw]. They place the nock of the arrow on the side of the second phalanx of the thumb so that during the draw and release, the index finger does not place weight on the dafak, since if it puts weight on it either the arrow is slanted or the dafak breaks. Between the arrow nock and the thumb protector, there should be distance with a width of the bowstring [This refers to how far below the nocked arrow the thumb ring should be placed. If it is done this way, there is a space for

the arrow nock to move as the string is drawn otherwise the string can press down to hard against the arrow nock causing the front of the arrow to lift if the pressure is high enough]. Some masters who have learned archery with experience use more distance as well but the opinion of this humble self is that more distance is not good. They should place the bowstring on the side of thumb protector and not fall on the back of the thumb protector [This is referring to placing the bowstring on the lip of the thumb guard, not on the edge of the base of the lip. Mustafa Kani also made this point. It may come from a problem with deeper thumb rings where the archer can let the string slip back to the base of the lip and against the thumb. This is the common way modern archers use the thumb ring]. The tip of the index finger should not enter the bow because of the tip of the [index] finger is inside the bow upon releasing, the bowstring hits the tip of the thumb and the arrow is struck and twisted and this is called a "rabbit's kick". It is said that the finger should be wrapped in halva [a type of sweet]. Therefore, upon drawing, the tip of the index finger should be parallel to the bowstring [By this it means, at the beginning of the drawing process the tip of the index finger should be pointing straight down, parallel to the bowstring which is also vertical. The fault is to curl the index finger over the thumb, which makes releasing the index finger slower and can result in the tip of the thumb being hit by the string].

#### **Tenth chapter: About drawing**

After they locked their thumb, they raise their bow ear from their knee and start to draw. They should keep the bow grip in the hand in a way that it does not move under any circumstances. The column [arm] and the wrist should be in line with the target in a way that the shoulder, the elbow, the wrist, the arrow nock, the arrow head and the target are all in the same line. None of these should be raised or lowered. If someone is standing behind an archer, they can see all elements in one line. The hand grasping the bow grip and the same side of the body should be in line with the target. Upon drawing, they place the face of the thumb in a way which was described. They keep the chin in line with the bow hand so that the bowstring does not strike the beard and moustache and chin. During drawing, they should keep some parts of the body in a special way so that they do not move. Otherwise,

the aiming will be deficient. First, they should keep the column straight. Second, they should not blink, third, they should not move. Fourth, they should not talk. Fifth, they should not laugh and pull faces. They should enter the bow arms in a way as if they were hiding behind it. As a master says in a poem:

Go sleep from the right side      Like a subject who bends his knees for prayer  
Hide from the left                      Make the undercoat empty

He pulled his skirt and threw it out. So that the bowstring does not strike back

[One sleeps on the right side to protect the left shoulder from being lain upon. Karpowicz mentions that the famous Turkish archer, Toskaparan, did this the night before a competition. Hiding from the left refers to the lining up of the bow hand and shoulder with the target so an observer cannot see the archer's shoulder and chest. Make the undercoat empty may mean sucking in the stomach so that inhaling causes the chest to expand. The last two parts seem to mean to pull the skirts of the coat back as seen in some miniatures, but it would not interfere with a standing archer. It may therefore mean something not so obvious].

Archers should know there are different types of drawing a bow. Some do "eyebrow draw", some do head-draw, some do "moustache-draw" and some do "chest-draw". But the best draws are the chest draw on horseback and moustache draw on foot [The chest draw is usually not as accurate as the moustache draw, but it can be used for long distance shooting]. In drawing the bow, they should not draw very fast. This leads to the twisting of the bowstring and in the process of drawing and releasing the arrow will shake. They should also not draw slowly as they say it will "tear the loop". They should keep the middle way [The implication is that faults arise from a hasty draw, but too slow a draw is bad too. Whatever tearing the loop is, a slow draw will result in a slower arrow with a composite bow. Twisting can also occur with certain bow types if they are held too long at full draw].

Archers should know the target for the arrow upon drawing the bow. The masters distinguish between different types of targets: sufficient, intermediary and "arrow tail". They also believe that it concerns the position of the arrow as well and

say that the arrowhead is the enemy and should not be placed inside [This means do not draw the arrow so far that the arrowhead is inside the bow past the belly]. Archery is a craft and in any craft, the more they practice it the better they become. First the arrowhead jumps from the support and the positions of the arrow which have been mentioned before will be explained. First is the sufficient where the end of the arrow which is the place of attachment of the arrowhead to the wooden shaft reaches the back of the handle. This is called the sufficient method. This method derives from "pulling a needle". The second position is intermediary. When the arrowhead passes the position of "sufficient" and reaches the middle of the bow grip where the arrow passes, this place is called "intermediary". Third, is the arrow tail and where the arrow passes the position of intermediary and the arrow and wood are attached to each other. The fourth position, which according to me is called "on the support", passes the proximal phalanx of the thumb and is on the support. When the arrowhead is shot from the support, it is called "discoverer of light". Many times in front of good archers who were bragging about their archery skills, this humble self shot an arrow from the top of the support and even top of the sleeve and hits the bush target in an impressive straight low line [This is the classic overdraw without a siper or other aid. It requires an extremely steady hand and a perfect release. The support refers to the area over the metacarpal bone at the base of the thumb. It can also be translated as flat. In the grip of the lion's head, the metacarpal is perfectly horizontal while the proximal and distal phalanges curve down out of the way. Instead of drawing on the support, we could refer to this as drawing on the flat].

#### **Eleventh chapter: About aiming**

You should know that each master has his own method of aiming. The masters of the past made a hole above the bow grip in line with the position of the "intermediary" and used it for aiming. Using this method they should "shoot in a closed way" so that the target can be seen through the hole in the bow grip [This could be literal and mean that Persian archers knew of a kind of peep sight drilled through the bow limb above the grip. Although the bow could survive a small hole through it, as an aiming method it is rather inflexible. It could also be figurative and refer to

aiming as through looking through the middle of the bow]. Master Tāher Balxi who is one of the most authoritative masters in archery said that they should aim at a target in a way that if they close their right eye, they can see the target from the back of their bow hand with the left eye. If they close the left eye, they see the target from the circle of the bow with the right eye. Some masters who shot with the methods of pulling and Anatolian. When they pull the arrow, they use the wrist as a channel to look at the target, wait a bit and then release the arrow. They do the archery in a professional and straight line so that the arrows reach their target faster. But keš and ruandāz have been and are more talikeš. This humble self has seen keš and ruandāz archers who have been talikeš. The arrow of a closed shooter also flies more straight. The closed archer who imagines a straight line does not miss their target. Best aiming was the aiming of Master Tāher Balxi. It is famed that he attached the arrow shaft to the arrowhead so that the arrowhead could be easily detached from the "place of attachment of the arrow tang to the shaft". He placed it on the bow and shot at the ceiling or the wall so that the arrowhead attached to the target. Then he removed the arrow shaft and placed some wax in the hole of the place of attachment of the arrow tang to the shaft. He did that so that the wind could not get into that hole upon flying. He drew the bow using that arrow shaft so that it landed on the arrowhead tang and he did not miss the target. They also report about Master Tāher that he shot at a grain of wheat in a wheat field on one dark night so that one of the poets mentioned it in a poem:

Grasp the bow like Bahrām and aim like Tāher  
So to shoot a grain of wheat in a dark night

The say that master Tāher could see only from one eye. When this humble self wanted to shoot at the ceiling target or in front of the feet, after drawing the bow, I aim from the third phalanx of the index finger of the bow hand, draw and release. If I have shot at the bush and long-range target, I have used the fingers of the bow hand [i.e. The index finger and the thumb] as a channel upon drawing and releasing as God willing I will describe this later

The result is that "close shooting" is better than "pulling " and "upper shooting". Most masters used the close shooting method so that one of the poets said about the close shooting:

Draw to the eye and keep it for a while

Close it in front of both measure holder and the world

But holding it for a long time is also not good. Because holding too long can lead to mesvāk and the biggest mistake in archery is mesvāk. The masters say that they should not even pray for the dead body of an archer who makes mesvāk with the arrow. The mesvāk means that when they draw the arrow to its position to release, they make the hand soft and the arrow twists a bit and then released and this is called mesvāk. The idea is to learn these two methods which are closed, pulling and ruandāzi. With principles they refine and improve their archery skills. Based on principles and rules, the principles of archery consist of shooting professionally, straight, low and high. In the chapter of aiming, it was already mentioned that the target of each distance should be aimed using a certain finger of the hand grasping the bow grip. To shoot at a ceiling or roof, they aim from the first phalanx of thumb of the bow hand. If they shoot at a bush, for example, if the of a bush is at five hundred steps, they use the little finger for aiming. If the distance is at four hundred steps, they use the ring finger for aiming. If the distance is at three hundred steps, they use the middle finger for aiming. If the distance is between two hundred to hundred steps, they use the arrowhead for aiming at the target. Another principle for confronting the enemy when they do not want their arrow to miss the target and if the distance between them and the enemy is two hundred steps, they use his hat for aiming. If the distance between them and the enemy is hundred meters, they use his mouth for aiming. If the distance between them is fifty steps, they use his chest for aiming so that the arrow does not miss its target and the enemy is injured [This chapter shows a clear understanding of the aiming methods in use. It is understood that when no point on the bow had is mentioned for the purpose of aiming, then the arrowhead or top of the hand is used. Therefore, aiming at the hat means raising the hand so that the arrowhead is pointing at the hat, i.e. aiming at

the top of the target to hit the center. While using the fingers is more like using a bow sight. Aiming at the chest at fifty steps means that the arrow will be travelling essentially in a flat arc and will either hit the chest or above on the target. At shorter range, direct aiming is possible and, at longer range, more indirect methods are used].

#### **Twelfth chapter: About drawing and releasing**

They should know their principles and the reason for the movements of the arrow. Any archer should know the principles of drawing and releasing and the customs of this art are that when the arrowhead reaches its target, they should use the power and strength to do it as if they are whipping a horse. First they open the thumb so that if they are killed and have no time to profess their own faith, this will serve the same purpose. It was mentioned before that if they open the thumb, this causes a problem as the bowstring hits the thumb face causing the arrow to go in the wrong direction. So they should remember to open the thumb fast and keep the middle finger, ring and small fingers tight as they were holding them in a way that when opening the thumb and the index fingers, these fingers [the middle finger, ring and small fingers] do not open. As they say, they close five fingers and open five fingers. Some masters and archers close five fingers and release five fingers and this way of releasing is wrong. When the center of the bowstring is on the arrow nock, the way of closing and releasing with five fingers consists of closing the middle, ring and small fingers of the thumb-draw hand [right hand in case of a right-handed archer] tight which is called the seat. Then they place the tip of the thumb on the seat and place the index finger around it. This is the way of closing with five fingers as five fingers are closed. Upon releasing, if they open the thumb and the index finger, this method is called "opening the two". If they open five fingers, this method is called "opening the five" [Though our author is a little vague about what the index finger is doing, his implication is that you open the index finger and the thumb and leave the other three fingers closed. The correct sequence is index finger first then the thumb but the action is so fast that an observer could not see the order of the actions]. Another thing is that the archer should know the reasons for the shaking of the arrow. They should know that the reasons for the shak-



ing could be because of the arrow, because of the bow and because of the archer. If this is because of the arrow, it is due to the fact that different types of feathers are used for fletching the arrow so that two feathers are coarse (hard) and one soft or other way round. Another reason is that the "tang of the arrowhead" is not attached firmly to the toligāh (place where the arrow tang is attached to the shaft). This way upon releasing the arrowhead moves in the toligāh and makes the arrow shake. Another reason is when the mouth of the arrow nock is tight and holds the center of the bowstring tightly during the drawing. Another reason is when the arrow is slanted [at an angle to the bowstring]. Another one is when the bow is very strong and the arrow light with a thin shaft that cannot handle the power of the bow. In this case upon releasing, the arrow shakes. Another reason is when the arrowhead is light and the feathers are heavy. All these reasons result in the shaking of the arrow.

The reasons [for shaking the arrow] which are caused by the bow are when the bow arms are not of the same size and are not drawn at the same level. Another reason is that when the bow is slanted causing the arrow to shake. The reasons [for shaking the arrow] which are caused by the archer are when they do not hold the thumb straight and press their thumb a lot on the "side of the arrow nock" accompanying it [in the wrong direction]. Another reason is that upon drawing and releasing, they twist the thumb so that the face of the thumb strikes the bowstring in a way that the thumb nail faces the ground and the index finger the heaven. This release is called "dragon head" [This position is seen in many Persian miniatures. Of itself, it is not a bad follow through position, but the author may be referring to an overly deliberate or exaggerated way of performing this action. If it is anticipated by twisting the hand before the release, it can cause excessive pressure on the nock of the arrow]. The reason is that the upper jaw of a dragon is longer than its lower jaw so that each time it tries to pick up something from the ground, it turns its head grabbing it from the side of its mouth. Therefore, this way of draw and release is called dragon head. This way of draw and release is improper and is a mistake causes the arrow to shake. Another reason is when they attach the arrow nock lower than the middle of the bowstring so that the feathers hit the bow limb. All these cases which were mentioned lead to the shaking of an arrow. They should take all

these into account so that the arrow does not shake and move and reaches its target straight so that they do not lose face in front of their competitors so God willing.

**Conclusion: About flight archery and knowing the distance to the target**

They should know that the masters have said that it is important that he makes a distance target in the desert close and a close target on the wall far. Archers should estimate the distance and know which type of arrow should be shot with which bow for which distance. Before this introduction, it was mentioned in the fourth chapter that archers should use the right bow and arrows and related equipment especially flight archers. Every day they should use part of the archery equipment such as a bow, an arrow or a thumb ring or change a bowstring so that they become interested in archery. The masters of flight archery have shot at a distance of one thousand and two hundred steps. They should make a flight archery bow with a "crescent-shaped curve". There are four types of a bow curve: "Bahrām type", crescent-shaped, even-curved and "four-curved bow". They should know that flight shooting is professional and the other is not professional. The professional way is when archers keep practicing archery and keeping their thumb straight [it is not clear whether the author means the bow hand or arrow hand thumb]. The non professional way is when archers are strong and shoot with power and a strong bow. But the method of the professional is better than the non professional. They should be "clean shooters" as some flight archers cheat and make inside the arrow shaft hollow and fill it with mercury so that their arrow is heavy and flies straight and far [Actually this refers to a sophisticated concept of changing the point of balance in flight because the mercury moves up and down the hollow shaft. If the shaft was completely full of mercury it would be too heavy for flight shooting]. If a flight archer goes to another archer personally to shoot, the masters ask him how he would do his flight shooting, whether he would look for a "measure holder" or he would measure the distance himself. If he answers he will go for the measure holder, he should use a bow and arrow with the same power as the bow and arrow of the measure holder and shoot with it. The masters do not like this boasting method as they say that the archer shoots gold sometimes and at times he shoots mud. It means sometimes he shoots well and the other times he shoots poor-

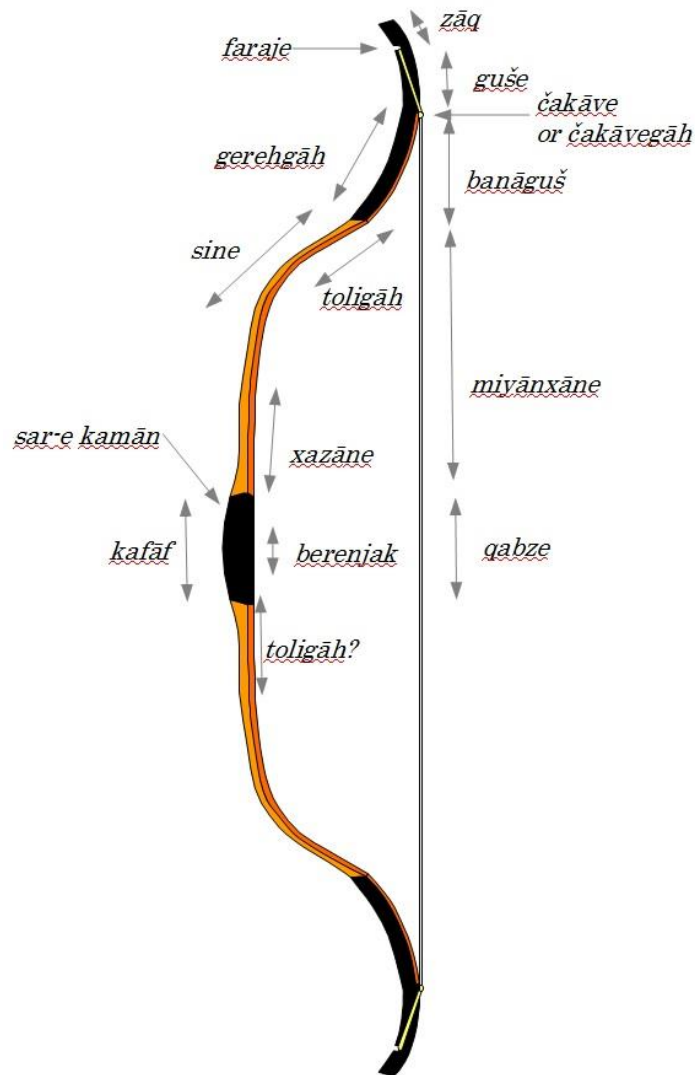
ly. It could be that on that day he does not shoot well and the arrow does not reach its target and loses face and be ashamed in front of masters and archers. Thus when they ask them, they should answer that they are archers and they would like to shoot with the bow in front of masters and archers so that the Great God decides whether my arrow hits its target. In this case, the masters would agree that they use their own bow [This is a complicated section. It appears the measure holder shoots a similar bow to the archer and they decide by who shoots the farthest and it is done in the absence of official judges and witnesses. The real meaning of measure holder would affect how this is understood. It might mean the holder of the record or the owner of the record if mil was used to mean the measurement of a record shot. If the record holder is the only witness and it is a contest of one bow against another, it is possible that the next time they shoot in front of witnesses the archer may not perform up to standard. This might be because the measure holder's bow set a lower level of competition because it was not at full strength].

When the flight archery arrow lands on the ground, the arrow nock should be at the same level as the knee [i.e. the arrow should be as it landed and not fallen over to lay flat on the ground]. The arrow nock of flight archery arrow or any other type of arrow, be it on the target or in the ground, should not twist when it leaves the bowstring and lands on the ground [This could refer to minimizing the rotation of the arrow in flight. Rotation uses energy to create drag to stabilize the arrow. Small straight set feathers minimize this for flight arrows. Large feathers that spin the arrow are good for short range shooting like hunting]. The archer should look at the field of the bow in a way that the height of the bow grip is in the middle of his eyebrows. A principle of flight archery is that the masters and archers select a person who has a rope and a piece of wood for measuring the ground with these. This person is called *jāqlāmaš*. The judge uses this wooden piece for the first round of flight shooting and first walks on the ground and places that wooden piece at the end of the distance in the ground. *Jāqlāmaš* sits at the end of the distance and informs the flight shooter whether their arrow has reached its target or not or if has flown straight or slanted [This official is indicating the distance and the deviation of the arrow from a straight line to the marker. In flight shooting it is usual to have something with which to line up the arrow to prevent deviation from the centerline

of the field]. For each there is a special sign [This was replicated in Tudor England in clout shooting where the marker used special gestures to indicate where the competitor's arrow fell in relation to the target]. The Jāqlāmaš threw dust in the air so that the archers can see where their arrow landed. They say that when one of the archers who was very good friends with a jāqlāmaš was shooting flight archery early in the morning and his arrow missed its target and landed in its shoulder for the depth of four fingers, the Jāqlāmaš stood up and ran ten to twenty steps behind the place where the arrow of the fraudster had landed. He pulled the arrow out, placed it in the ground and threw dust in the air. Flight archery is a good art provided that it is done based on one's ability and in a clean way. Next they should know the different types of the art of archery and they should follow their principles. First they should do the ritual washing and send greetings to the Messenger, the blessings of God be upon him and his family. Then they say God is great and send it to the soul of the arrow and the owner of the bow. They pray for their master and keep their arrow and bow in good shape. They hold the column (the bow arm), the bow grip and the wrist properly and straight. They take their arrow quickly and in a nimble way. They shoot the arrow with courage, openness, speed and straightness. In flight archery, they keep both shoulders back. As the master said if you want your arrow to pierce the center of an anvil, turn your body slightly and use both shoulders. At the end, they should use new power, hide their chest, "shoot with four strikes" [while zarb shooting is used in Turkish to mean shooting against hard objects, it could mean here to shoot after holding for four heart beats. This would be a small hesitation at full draw], and shoot with a thumb [If this is šast, it could also mean thumb ring as sometimes "thumb" was used as an abbreviation]. They keep the chin in line with the chest of the bow hand, keep the thumb leg [the right leg for a right-handed archer] strong as a column, keep the knees apart from each other a bit and trust in the leg of the arrow hand. They "shoot dispassionately", shoot with the thumb hand in front of the feet, at the target, long-range target, flight archery, shooting a thin arrow from a bow with short limbs, to know the weather conditions, pulling the training bow and train every day. All these things which were mentioned make up the art of archery. Additionally, archers should know how to repair the bow, to string the bow, to fletch the arrows and to get the

twists out of arrows. If it is necessary they can repair the bow and arrows so that they do not need the others.

This noble manuscript on archery is finished written by al-Abdolrāji Abu Torāb al-Musavi al-Qad Makāhi In the date of a day of Jumada al-Thani, the year 1114 (November 1702) Ground salt crystals in a bowl all look the same. It is believed that everyone who eats salt has to respect the "right of the salt".



Persian bow parts as described in the manuscript

**Table 1: Translation and interpretation of most important archery terms as described in the manuscript.**

Number	Persian	Transliteration	Translation	Interpretation
1	زاغ	zāq	nock	String nock of the bow
2	فرجه	faraje	slot	The slot of bow nock
3	گوشه	guše	Corner; ear (گوش)	Ear, the rigid end of the bow arm
4	چکاوہ	čakāve		String knot rest
4	چکاوہگاہ	čakāvegāh		String knot rest
5	گرہگاہ	gerehgāh	conjunction	Area below the string knot rest
6	تلیگاہ	toligāh		The tail of the gerehgāh or possibly where the bow arm meets the grip; where the tang meets the arrow shaft
7	بناگوش	banāguš		Area between the string bridge and the bend of the bow. Literally “parotid” or “beside the ear”.
8	سینه	sine	breast	The bend of the bow arm
9	میانخانہ	mīyānxāne	Half the bow arm	The middle of the bow arm
10	خزانہ	xazāne	treasury	The section of the

				bow arm adjacent to the bow grip
11	شفيح	šafi'	mediator	The join between the bow arm and the grip
12	كفاف	kafāf	Contour	Ridge on the back of the grip (matn, متن , in Arabic)
13	برنجک	berenjāk		Piece at the meeting of the upper and lower horn strips on the belly of the bow
14	قبضه	qabze	grip	Grip or handle of the bow
	اهل قبضه	ahl-e qabze	People of the grip	Master archers
	حلقه	halqe	ring	Ring; the shape of a bow reflexed during manufacture
	هلال	helāl	crescent	Crescent; The shape of the strung bow
	دايره	dāyere	circle	Circle; the shape of the drawn bow; the target
	سرکمان	sar-e kamān	Head of the bow (using sar in its Arabic sense this could be the mystery of the bow)	The arrow pass

	سوفار	sufār	nock	Arrow nock; the head of the arrow
	سر سه	sesar	Three heads	Triple loop, a kind of bowstring knot
	دور	davr	role	

### Conclusion

This manuscript makes a solid contribution to the understanding of Persian archery at the beginning of the eighteenth century. It increases the understanding of the specialist vocabulary that archers used to describe their bows and the shapes of bows. The parallel of Turkish archery under the Ottomans is profound showing that national cultures shared many ideas despite periodic warfare and major religious differences. New descriptions of methods of holding the bow and a different terminology help with the interpretation of the techniques of shooting making the reconstruction of the various schools of Persian archery teaching possible. The detailed descriptions of targets and the methods of practising add to this valuable material.

What is also clear is that, despite the connections with earlier literature on archery in other languages, Persian archery was distinct and consistent in its unique approach. While a few Arabic terms appear in the names of parts of the bow, the majority of words are Persian. When compared with earlier Persian manuals on archery, this manuscript is clearly in the mainstream of the development of the national archery culture. The development of a strong sporting component also connects with earlier writing on archery in Persian.

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