asian traditional archery manual

foreword

As far as I know, there is no practical manual on asian archery traditions. So I began to collect informations on the web and tied them together in a single document. At first it was intended for my own personal use only. But then I thought it might help other archers wishing to shoot this way. So it was converted to pdf and uploaded on my website:

www.co-creation.net

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v2

thumb draw

Most asian archery is performed with a thumb draw using a thumb ring. Many call this the mongolian draw also the technique is shared by almost all asian archers.

the mongolian draw

Buryats held the bow in the left hand and with the right hand, pulled the string back forcefully to behind the ear. The left hand then extended fully until the arrowhead came to the bow. To protect both the fletch and the hand, they used special hallow bone thumb rings worn on the thumb of the right hand. These were also made of thick skin. The main load was borne by the thumb, covered by the index finger just pressing on top and supporting it. This is known as the “Mongolian release”. The arrow is kept in the cleft between the thumb and index finger, so preventing the arrow from deviating to the left. The arrow is always shot from the right side of the bow in the Mongolian release.

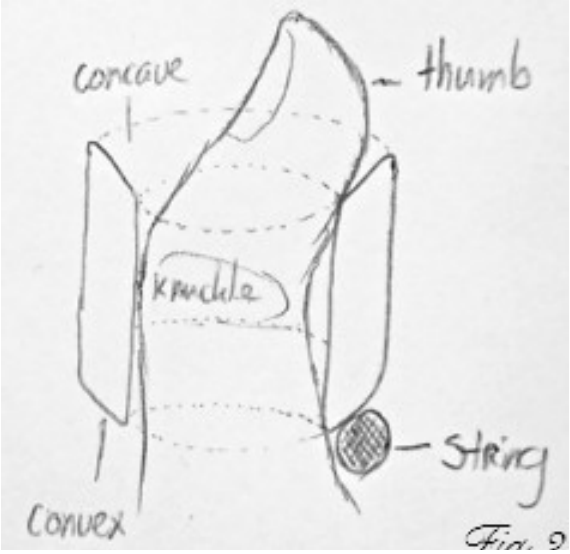
There are a number of important matters to consider before using the Mongolian draw:

- The Mongolian draw is suited to a bow which can withstand being drawn back 30 to 36 inches. Do not try it unless you are using a recurve that easily draws back that far without risk of stress or excessive stacking.
- Use a light bow until you are very familiar with the movements.
- Prepare some arrows of suitable length. Err on the side of having your arrows too long. Don't worry too much about spine and your normal arrow measurement at first.
- Make sure your thumb-ring fits snugly and not too tightly. You thumb will swell after about 10 shots: allow for that.
- If possible use a thicker string than normal or place tube of soft leather round the string at the arrow nocking point: thumb-rings are not designed for comfortable use with a narrow string.
- Keep your nails - especially the thumb-nail - trimmed short. The Mongolian release neatly but painfully removes long nails.

the thumbring

Different styles of ring:

1. manchu ring: a simple cylinder of bone or stone like this



The ring must sit on the joint of the thumb and not be pushed past it. It feels counter intuitive and it seems the ring will easily slip. But when done right it is held firmly in place. Finding the right place requires some trial and error.
Catch the bow string on the very end of the cylinder.
The index may or may not be used to lock the thumb.
It provides a very crisp release and does not need to be aligned prior to use. [1]

2. thumb ring covering the thumb pad with a groove where the string sits

Wedge: Located at the bottom of the front of the ring, the base of the wedge is used to hook the string.

It gives the thumb joint more room to bend and provides a more stable hold on the string (the string rests across the dimple, which mitigates unintentional

1 http://mandarinmansion.com/articles/Using%20Manchu%20thumbrings%20Peter%20Dekker.pdf

up/down rolling).
The index is what hold the tab and end of thumb at a 90 degree angle. The release is just like flicking a coin off your thumb knuckle.

3. ring covering the thumb pad with no groove
With no groove, the string can rest in a way that allows to bend the thumb a bit less, and it'll kind of 'pop off the edge' when you release.

wearing the ring[2]

For right hand archers: With the ring side down and paddle side up, slide the thumb ring onto your thumb and past your knuckle. Point the paddle portion toward your index finger to move it past the knuckle.	
Once past the knuckle you will rotate it 90 degrees over the pad of your thumb. At this angle the thumb ring should be too tight to pull over the knuckle.	
If too loose the thumb ring may be pulled off your thumb when shot. For safe and proper fit the thumb ring should not be able to be removed unless it is pointed to the side.	

2 http://www.koreanbow.com/Manual.pdf

making a thumb ring

from pvc pipe [3]

cut the pipe at an angle

3 https://www.youtube.com/watch?v=Ct6YV2T3YSo

soften with heatgun and make it fit your thumb

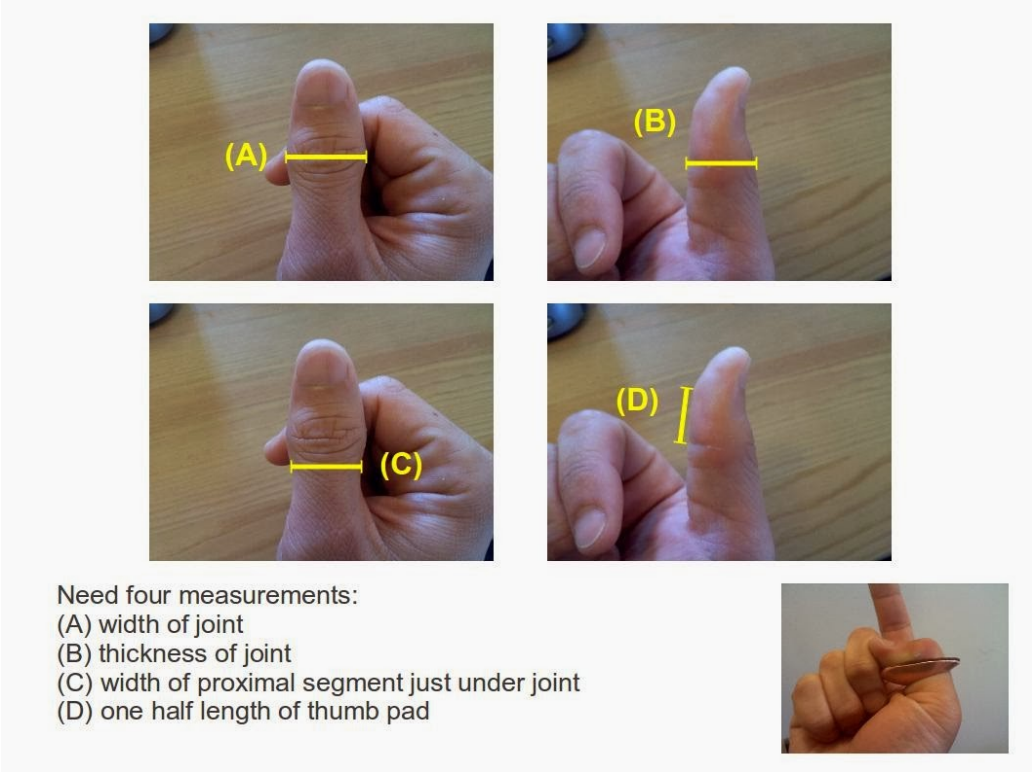
file and sand

making an archery thumb ring out of antler [4]

A single large antler piece should be enough for me to carve 4 - 6 thumb rings.

Step One

To make your own archery thumb ring the most important step will be measuring your thumb so you know what size to make your thumb ring.



4 http://www.projectgridless.ca/2014/02/antler-thumb-ring-for-archery.html

Step Two
Cut your antler into various pieces, each large enough for a thumb - some of them may not fit your thumb, but you can sell any extras you make for a tidy profit to people who want their own antler thumb ring.
You can experiment with different shapes if you want, but I have gone for the classic thumb ring shape.
Note: Do NOT soften your antlers in water before cutting them with any soft of saw. It will guck up your saw and be a mess to clean. Only soften the antlers in water when your are ready to carve with a knife.

Step Three
On a wooden board (so you don't damage your work bench) drill your thumb rings using a 1/2 inch drill bit and use a set of vice grips to hold the antler pieces steady while you work. Drill the holes all the way through.
You can even widen the holes further by using a larger drill bit or by angling the drill bit slowly in different angles to smooth / widen out the hole.

Step Four
Soak your antler pieces in water for at least half an hour to soften them up a bit. Myself I soaked them in hot water, figuring that a little extra heat would soften them up faster.
Technically it is preferable to soak antler for a week before carving, but I was in a hurry. Another possibility is to boil them in water for an hour - which I felt was excessive, but whatever. Soaking them in hot water worked just fine for me.

Step Five
Carve each thumb ring individually using a very sharp carving knife. Be careful not to cut yourself. As you carve periodically check to see if the thumb ring will fit your thumb. When it starts fitting your thumb carve it according to your personal comfort levels.
If you have a rasp or files use those too. They're very handy for this kind of work. I am also periodically using very coarse sandpaper to smooth down some of the bits, but a file works faster.
Be careful not to make your thumb ring too big, otherwise it will slide around on your thumb too much.
If you take a break or leave your work for several days you will need to repeat Step Four before resuming Step Five again.

Step Six
Polish your near finished thumb rings using fine sandpaper.
NOTE - Wait until the antlers are completely dry. Sandpaper polishing antlers that were recently soaked in water doesn't work very well.

Step Seven (Optional)
Cut a groove into the flat side of your thumb ring where your bowstring can

hook into. Some archers like having a groove there so the bowstring doesn't slide around as much - some archers don't like the groove, saying it causes problems during the release. It is up to you.
NOTE - Antler dust SMELLS HORRIBLE. I know Koreans love drinking antler dust tea as a curative for arthritis and similar ailments, but I can only assume it also tastes horrible. Open a window and remember to clean up after you are done to get rid of the smell.

mongolian archery

technique [5]

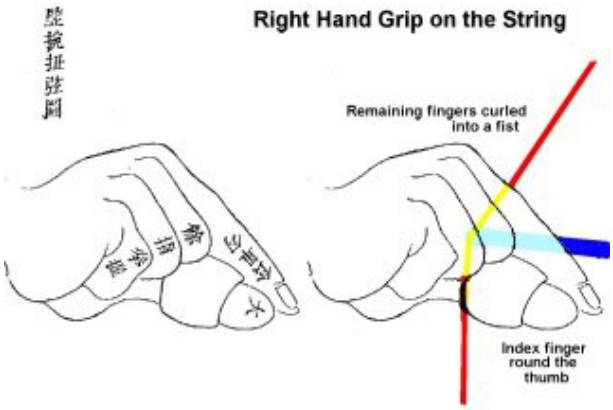
Bow Hand

Grip the bow with the main weight to be taken at the web of the thumb, opposite the index finger (the web of the hand is a fold of skin which connects the digits). The thumb should curl around to extend past the point of the index finger. When the bow arm is extended, the top side (not the bottom side) of your bow arm should be perfectly level. The bow hand must not tilt upward. The remaining three fingers curl around the grip as if grasping an egg. They should exert a firm inward pressure on the bow grip without straining. Point at the target with the first joint of the thumb: not the index finger. That will encourage the elbow joint to take the correct position. The cup of the elbow joint should point upward and the knob downward. This will help you to prevent your shoulder from coming up.
In the Mongolian draw, the shaft of the arrow rests on the thumb/forefinger junction at the grip of the bow (not on the knuckle). For the right-handed archer, the arrow will pass to the right of the grip and for the left-handed archer, to the left.

String Hand

First get the arrow nocked on the string. Place the arrow so that it is at right-angles to the string (not pointed slightly downward.) Draw the arrow back one inch on the string and grip the arrow shaft with the bow-hand fingers like holding a pen. Now the arrow will be held firmly by the tension of the string and you can move around freely with the arrow nocked and held in one hand. Use the string-hand forefinger and the string itself to make a final adjustment to the thumb-ring so that it is comfortable at the base of the thumb, then hook the thumb around the string with the string at the bottom of the ring, adjacent to the base of the thumb. Curl the index finger around to support the thumb just behind the nail. (Not on the nail itself. And ensure that the nail is cut short!) Curl the remaining three fingers back and press them lightly into your palm. Lower both arms so that the arrow is pointed forward at the ground about a meter in front of your feet; take the strain of the string, drawn about an inch, back from the bow-hand fingers and re-arrange the bow-hand fingers as described above. Relax your body completely and clear your mind.

5 http://www.atarn.org/FAQ/thumbring.htm



The Draw

Raise the bow and and string hand high to come into the draw. Inhale while you are doing so.
Draw smoothly pulling back and down with the string hand and pushing forward and down with the bow hand. You should be able to draw the arrow so that the draw-hand is above your nipple and the bow-hand is extended straight out. Do not let the draw-hand elbow droop [affaisser]. Do not let the bow-hand turn up. Keep your shoulder from hunching. Do not try to release with the arrow at eye-level. You cannot sight down the arrow without spoiling the draw. If your bow-hand is slanted upward to eye-level, when you release it will drop and spoil the shot.

The Full-draw and Release

When the arms are quite level, there is a straight line from the bow-hand wrist, through the elbow to the shoulders and then back to the string-hand. For elevation, raise the bow hand and drop the draw-arm elbow in co-ordination: but keep them in a straight line. Do not bend back at the waist. Your body should be perfectly vertical and your head as if suspended from the top with a string from the sky. At this point, try to push the breath in your chest down into your abdomen. Use the back muscles to bring the arrow back: it is not ready for release until the arrow head can be felt touching the junction between the bow-hand forefinger and thumb. Do not jerk back: let the arrow come back slowly and allow the feel of the arrowhead arriving act like a clicker: relax the draw-hand forefinger and thumb simultaneously. The arrow leaves the bow and the the draw-hand elbow falls back. Release your breath gently.
The bow-hand must not react! It must remain perfectly still. Do not drop the bow hand, fling back the string hand or do any theatricals. Just remain still and relaxed. Observe the flight of the arrow and correct your faults accordingly.

Concentration

As you draw the string back, you concentrate on the target. Pick the smallest point visible on the target. If it is a target butt, concentrate on a hole left by a previous shot: not on the whole yellow circle. If the target is an animal, concentrate on a single hair or feather, not on the breast.
Between the time when you feel your arms and shoulders are level, and before the arrowhead reaches the finger of the bow hand, maximize your concentration. But do not concentrate on the *target*: you already know where it is and your mind and limbs already know what you want to do. Concentrate instead on your shot. Concentrate on the feeling of the shot being right. Wait for the feeling of the arrowhead on the finger, and when it arrives, do not hesitate: relax and release. The release is not anticipated. It is like a dragonfly touching the surface of a pond or a ripe gourd falling off the vine.

Horseback archery

In the military, each soldier carried two bows on horseback. One bow was for long-range shooting, another for shooting at close distances. Also, each soldier had two quivers with arrows for different purposes. To mention but a few of these, there were armor-piercing arrows with a particularly heavy arrowhead of tempered steel, there were incendiary arrows for setting buildings afire and spreading fear in the enemy ranks, as well as whistling arrows for signaling. Of course, the majority of arrows they carried were ordinary arrows where the arrowhead and length of the shaft were adjusted to the normal range at which the particular type arrow was to be used. The standard, according to James Chambers, was that each soldier should have at least sixty arrows with him or her. Also, the women who did not ordinarily participate in military activity nevertheless had to learn how to wield the bow, a necessary skill for self-defense as well as hunting.
N. Witson described their technique well. They would sit very low on horseback while pointing the bow at the enemy, and turn the body sharply to make the shot. Arrows were shot high so as to fall on the target vertically for greatest penetration. When shooting, both eyes were kept open. The second arrow was shot horizontally so that both arrows would impact simultaneously and nearly touching each other. N. Witson witnessed this incredible feat.

Draw weight

The draw weight of an English longbow averages around 70-80 pounds, whereas the Old Mongol bow had a pull that, according to George Vernadsky, averaged at around 166 pounds. Chambers states that the pull varied from 100 to 160 pounds. This seeming discrepancy certainly reflects the fact that draw weight varied with the strength of the user, and with what use the bow had been made for. As could be expected, there was a considerable difference in shooting range. Whereas the English longbow could shoot at distances up to 250 yards or around 228 meters, the Mongol counterpart can hit its target at

350 yards or 320 meters and, if the archer is well trained for the task, even beyond that.

Targets

There are basically three kinds of archery in Mongolia – Khalkha, Buryat and Uriankai, given the specifics of the lifestyle and pattern of different Mongolian tribes.

In Uriankhai archery competition, 30 arrows are shot at the target, balls weaved of camel hide from a distance of 40 meters. The winning archer not only hits the target most, but his shots roll over the ball targets to a small mound of soil erected behind the piled target of leather balls. Uriankhai arrows are 90-100 cm long, 1.1-1.3 cm in diameter and weigh 50-60 grams.

In Buryat archery, both men and women compete and shoot at cylindrical targets made of weaved camel hide from a distance of 30 meters (women) and 45 meters (men) and let loose a total of 64 arrows. The Buryat arrows are 140-150 centimeters long.

While national or Khalkha archery is the standard and targets are shot at a distance of 65 meters for women, and 75 meters for men. Khalkha arrows, as compared to Buryat arrows, have tips made of animal horns and the fletching is made from bird feathers.

demonstration [6]

Choijelsurengiin Mendbayar posed for these photographs in June 1998 in Ulaanbaatar, the capital of Mongolia. Mendbayar learned archery from his father, renowned archer and bowyer Choijelsuren, when he was 14 years old. He is now 39. He is the brother of Munkhtsetseg, the National Women's Archery Champion of Mongolia and makes the bows she shoots with.
(photographs and commentary © Stephen Selby, 1998)

First the bow is strung. Mongolian composite bows are strongly recurved and cannot be strung by one person without risk of damage. Mendbayar gets his sister to slip the string loop over one string nock while he pulls the ears of the bow back against his knee. The hands grip the ears opposite the string bridges, with the thumbs keeping the string from slipping off the bridges during stringing.

6 http://www.atarn.org/mongolian/mngtchnq.htm

With the bow strung, Mendbayar grips an arrow near the nock with the bow tucked under his arm, the lower tip resting on his boot.

He cants the bow to the right and prepares to set the arrow against his knuckle, to the left of the canted bow-grip. His sister regards this as un-traditional. (Their father did not shoot this way.) The traditional method is to shoot over the thumb, to the right of the grip.

Mendbayar nocks the arrow at the serving on the string.

He checks visually that the arrow is centered on the serving and firmly nocked.

Now it's time to start concentrating on the target. At this point Mendbayar will check the wind by looking at a small flag placed near the target.

Next comes the first stage of the draw. Mendbayar breathes in. His eyes remain fixed on the target. At the lower tip of the bow you can see a piece of wooden dowel placed between the string loop and the sayah on the archer's side and taped to the limb. This will give the archer a little protection if the bow becomes unstrung when drawn. It is only needed if the limb has developed a twist (a common occurrence.)

The pre-draw stops at this point. Mendbayar pauses for a couple of seconds to settle his breathing and aim at the target.

Now Mendbayar is at full draw. He holds at this point for about three seconds, focussing fully on the target before he releases. His draw-hand fingers are flared upwards and outwards to put a slight twist on the string.

chinese / manchu archery

chapter 13 of the *New Book of Discipline and Effectiveness* [7]

According to the *Biographies of Eminent Women*, you should "draw the bow in a state of tension and release it in a state of relaxation." The 'state of tension' means coming to full draw with all your might; the 'state of relaxation' means that your mind should be calm and concentrated.

"The draw-weight of the bow corresponds to the strength of the archer and the spine of the arrow corresponds to the weight of the bow." This is of the greatest importance. That is why, to quote Xun Zi, "If the arrow isn't correctly spined for the bow, even Yi couldn't score a hit with it." In Mencius, it says, "When Yi taught archery, he insisted that that [students] drew their bows fully." Our students must also draw their bows fully. The archer's most important technique is "Grasping the bow, concentration and firm stance." 'Concentration' is minute attention [to your shooting]; 'firm stance' refers to maintaining a firm grip on the bow. The string slapping against the sleeve is always caused by an insufficiently steady grip on the bow. The arrow porpoising and lacking force is always due to the arrow-head failing to contact the finger. [Wang Ju's] Manual says, "Without the arrow-head against the finger, there is no potential for a hit; if the finger doesn't feel the arrowhead, it's just like being blind." 'Finger' here means the end joint of the middle finger of the bowhand. 'The finger feeling the arrow-head' refers to the feeling the arrow-head against the joint of the middle finger – not using your eyes. You cannot achieve a full draw unless the end of your finger feels the arrowhead. You must do that with every arrow before you can really talk of shooting.

'Concentrating' is concentrating during the moment between reach full draw and releasing the arrow. Nowadays, archers start this concentrating process as soon as they have drawn the arrow over two-thirds of the way back. What good does that do them? And as for 'concentration', lots of people just think it's no more than concentrating on the target. They do not realize that concentrating on the target is secondary to the issue of concentrating on how you are going to hit it. The point is, at the moment of reaching full draw, your attention in stretched to the full, your arms and legs are no longer straining. If you release without premeditation, then whether the arrow travels straight, and whether it hits is not determined by your conscious mind. You have to deepen this concentration, make your mind open, your arms and legs firm but relaxed. After that, the arrow is released, and there is no reason for it not to fly straight, not to hit the target.

The word 'concentration' in [Wang Ju's] Manual is the same as 'meditation' found in the 'Great Learning' : "He meditates on it and then he is able to achieve it." When a Gentleman is seeking to prefect himself completely, he knows at what point he should have reached that [perfect] stage, and resolves to attain it, then becomes tranquil, then at peace. And he must be able to

7 Qi Ji-guang (1528–1587, military general of the Ming dynasty)

meditate on these qualities before he will be able to totally fulfill his aim. When a Gentleman is practicing archery, at the point where he has already drawn his bow fully, and in the moments before he releases the arrow, he must concentrate on his shooting stance, and then he will have the assurance of hitting the target. You need to know what is behind the concept of 'concentration', relate it to the concept of 'meditation' [in the 'Great Learning'], get completely into it and then you will succeed.

You grip the bow with the thumb resting on the middle finger: this is the greatest of the old shooting tricks. You must never fail to apply it. In horseback archery, always release when you are [at least] ninety per cent of full draw: Never forget! It's difficult to hit when the bow is just seventy or eighty percent drawn. When it comes to archery on horseback, you should always take two arrows, grasping one firmly against the grip of the bow while nocking the other on the string where it is handy. Sticking arrows into your collar or belt: neither is convenient. Always do exactly as I say!

Whenever your arrow goes off, it's better for it to go high and pass over the target. Watch you don't let it go low and not reach. Everyone makes this mistake. Don't forget! When you're shooting in the examination ground, you must keep your cool. The thought of missing must never enter your mind. Carry on as if there were no examining officer watching over you, just be as you would in your daily practice: one arrow – nice and slow – feel the arrowhead with your finger – next arrow – concentrate with each arrow – next arrow: how can you fail to hit? To give you that advance assurance that your are going to hit you must always be at ease and doing things in your own time. That assurance can only come from the absence of nervousness or haste. If you are hasty or nervous and you still hit, that's no more than a lucky shot.

If you have still not scored a hit after your first five shots, you must still keep yourself at ease, keep up you concentration. You must never rush your movements just because you still have not scored a hit yet. If you rush your movements, then shots six to nine have no way of hitting either.

Wang Ju's manual for horseback archery says,

As powerfully as if chasing the wind,
The eye moves like a bolt of lightning,
Draw the bow fully, immediately loose off the arrow,
The eye is fixed unblinking, You body as solid as rock,
Don't lose your momentum

Bring up the bow like 'the moon rising from your breast'. Place the arrow on the string like 'placing scales on the string.' Your breathing should co-ordinate with the actions you are carrying out in your mind.

So [Wang Ju's] Manual says: "Don't worry that the bow's [draw-weight] is light: get used to it, then you'll still get a good distance from it. If you're worried that a bow's draw-weight is weak: draw it and it will naturally fire

crisply.” But to get sufficient strength to draw your bow you must draw it fully. Starting off by shooting at short range, then getting further away is not an easy method. Basically you still have to learn to pull the bow back to full draw and be able to cover a long distance, then you come back in and start working up your accuracy. It’s not as if someone who has never pulled a bow just restricts himself to twenty to thirty paces. That’s just holding oneself back. How can you ever achieve any distance?

Whether you’re shooting at an enemy or at a target, you must take a firm stance and keep your attention on your target or your enemy: don’t look at the arrow while you nock it. If you blink for a moment, you may be unable to dodge in time and someone would get the better of you!

Whenever you shoot, your forward leg position should be as if you were stepping on something and the rear leg should be bowed. Any movement to follow the aim of the arrow should only be with the rear foot. The bow-arm shoulder and the hip should be directly opposite the toes of the right foot, “not quite at right-angles and not quite in a V”. If you are shooting to the right, move onto the left foot; if you are shooting to the left, shift onto the right foot: these two phrases express the knack of scoring a direct hit. That covers foot position.

Then you [push forward] your bow-hand as if pushing away Mount Tai; and your string hand is like hauling on a tiger’s tail. One fist keeps control, keep the front and back fists level and straight, draw the bow slowly then release with your hands held tense. If the target is big (close), drop the hand to the small [area of the target you are aiming at]. If the target is small (distant), raise your hand to aim at the whole of it. ‘Dropping’ the hand means dropping the bow-hand, while ‘raising’ means raising the bow-hand. These two phrases are fundamental to archery. The bow hand ‘thrusts’ and the string hand ‘snaps’: this is the knack of co-ordination. Take up the strain evenly [in both arms] and make both arms and shoulders extend. If you do this right, the arrow will go fast and will reach sever times further than the normal way. That wraps up hand technique.

Positioning the cheek next to the string, the neck arching back, the chest jutting out, the spine arching backwards ¾ all of these are error of stance. That wraps up stance.

If the arrow doesn’t fly straight, the problem stems from the draw-hand thumb hooking the string too tightly. This is in turn caused by the ring finger and little finger being open and relaxed. This is a beginner’s error. When you shoot, try pressing an inch or so of straw between your ring finger/little finger and the base of the palm of your hand. The straw mustn’t fall when you release, and then the arrow will fly straight.

When you fire in the face of the enemy, as long as you keep up your courage,

keep the level of your strength stable, keep your potential energy high and restrain it on a short leash, then every shot will strike home and no-one will be able to get away from you. To achieve this, you need to keep all of your actions short of the maximum: draw but do not pull the bow to the full extent of your strength; and make sure every shot counts. Only with your arms straight and even can you take a firm stance: this will naturally make you potential energy high. You need to wait until the enemy is within a few dozen paces so that you are sure of hitting with a single shot you are sure to make a kill.

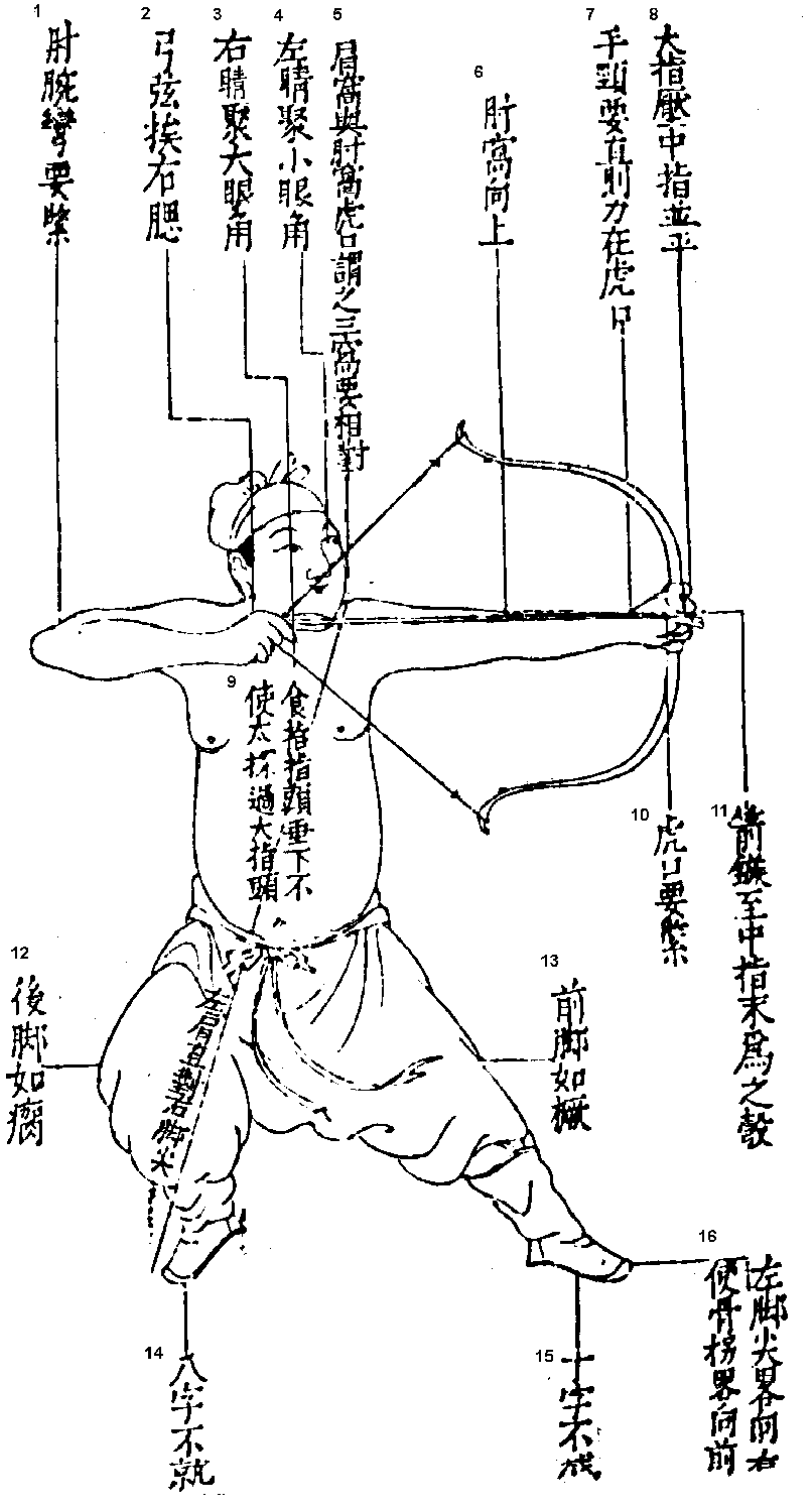
If you are worried about being at close quarters or the enemy's blades are nearly upon you: this way each shot will be rewarded ten-fold. When you are involved with the enemy in cavalry warfare, shoot the largest target on the field: don't just shoot at people. The famous poem goes:

When you pull a bow, then pull a bow that's strong
And when you fire an arrow, fire the one that's long!
Before you shoot the rider shoot the horse,
First take the leader, ere you take the rebel throng!

Always attend to your horse's appropriate feeding and seasonal rota. Train her to pace correctly, to be obedient over moving on and stopping, not to panic when she encounters obstacles, and not to cut corners at the gallop. The forelegs should move forward together from the level of the ears, and the rear legs need to come forward coordinated with the front legs. This makes the movement both quick and stable, allowing the rider to use his weapons. A man's life depends on his horse. The steppe-land horses are used to warfare much more than those of the Chinese. This is the fruit of regular training.

Illustration of the 'Firm Grip' Archery Method According to this method, when the bow is fully-drawn, the left forearm is straight like the bowstring and the bow tilts like the moon. The bow-arm is level with the nipple.
Illustration of the 'Pushing with the Flat of the Palm' Archery Method According to this method, when the bow is fully-drawn, the outside of the elbow points down and the elbow itself is straight like the arms of a balance. The bow must be held at the eighty per cent of level position.

illustration from the Wu Bei Yao Lue [8]



8 Outline of Military Preparedness: The Theory of Archery by Chen Zi-yi, 1638

This picture illustrates a military and civil examination standard position which was popular in the Ming and Qing Dynasties. The stiff extension of the forward leg was a fashion of the time, and was criticized by some contemporary and later writers;

1 Elbow tightly bent
2 String close in to the right cheek
3 Right pupil at the inner corner of the eye
4 Left pupil at the outer corner of the eye
5 The armpit, inside of the elbow and web of the thumb (called the 'three cavities') all held level.
6 Elbow joint aligned vertically (inside of elbow facing up)
7 Wrist straight with the force taken between forefinger and thumb.
8 Thumb pressed against the middle finger and level with it.
9 The point of the forefinger should hang down and not extend too far beyond the thumb
10 The space between forefinger and thumb must be held tense
11 Full draw is reached when the point of the arrow reaches the end of the middle finger.
12 Back leg bowed
13 Right leg as if lightly stepping on something
14 Almost in a 'V' position
15 Slightly off the line to the target
16 Left toe pointing slightly to the right making the ankle extend slightly forward.

Note that the bow being used is quite different from the heavy Manchu bows that you can see in photographs from the nineteenth century. They bear a closer resemblance to the traditional bows now in use in Korea.

Huang Zheng-Nan's Archery Method [9]

Master Wang Zhen-nan possesses a superlative skill, that is: archery. Hearing of the Master's reputation, I packed up my rations and made my way to study at the feet of the sage. Archery holds first place among the Masters affections, yet both studying it and teaching it put him under great pressure, so he was pleased to have me to help pass the skill on.

His archery method is as follows:
First, the equipment must be optimized. That is to say, the weight of the bow must be arrived at on the basis of one's own strength, and the arrow must be selected in accordance with the draw-weight of the bow.
The power of your arms must exceed the draw-weight of the bow: not the other way round. If you have the strength to draw four or five li, you are better off drawing three or four li. In the old days they measure draw-weights in stones: nowadays we use li. One li is nine catties (1) four ounces (5.5 Kg). A three to four li bow needs an arrow of ten ba (2) with a weight of ten 4.5 qian (16.65 gm.) A five to six li bow needs an arrow of nine-and-a-half ba weighing 5.5 qian. On the whole, target archers prefer a bow with narrow limbs and light arrows. For shooting in battle, people prefer a broader bow with heavier arrows. (3)

The second element is aiming. Target distance varies, and so if you want to control how far the arrowhead goes, you have to raise or lower the bow-hand accordingly.
Not knowing where the arrow will come down is called '[loosing] a wild arrow'. To know where the arrow will fall, you need to divide the distance by the elevation of your bow-hand. If you have a target at 80 paces (124m) (4), then you need your hand level with your shoulder. At 100 paces (155m), it needs to be level with your eye; at 130 to 140 paces (about 210m), it need to be level with your eyebrow. As far out as 170 to 180 paces (about 270m), it needs to be level with the top of your cap. (5)

The third element is stance. There is a method of positioning the body, a method for positioning the hands, a method for positioning the feet and a method for using the eyes.
Although shooting is something you do with your arms, its real basis is in your body [position]. Avoid sticking out your chest or leaning backwards; You need to approach it like boxing: keep the body low and coordinate your upper limb movement with your foot-work, then your body position will remain firm and your bum will not stick out. This allows your shoulders, elbows, hips and thighs to concentrate the strain evenly in one place.

The main aim of arm method is to achieve a straight line. Every joint of the left hand, elbow and shoulder needs to be level with the right shoulder and elbow.

9 Huang Bai-jia (1634-1704)

If you are drawing and releasing, the bow hand must not react and you must make maximum use of combined strength and skill. You must achieve a consistent correspondence between the positions of the right arm, point of the left foot, heel of the right foot and the shoulder and arm above it. You can't rely on your eyes fixed on the target alone: if the eye is riveted to the target, then on the contrary, the arms will not stay level. Only when you have fixed your stance correctly, you have made the point of your left foot point directly at the target mound and your mind, you have your trunk and limbs correctly aligned, then your arms and feet will respond on their own. At full draw, you glance at your left arm with your right eye and you are sure to hit!

This gets down to a lot of detail and those of have had training from a specialist in his secret skills may have heard it before. Yet it is the point to which this Master pays the closest attention, the one matter in which he rejoices and relies the most, and whereby his skills far surpass those commonly seen around him. Hence when drawing the bowstring in the examination ground, the sighting arrow flies and the point where the arrowhead falls is noted, and then not one arrow in a hundred will miss its mark.

You should roll up a sleeping mat and use a stool to prop it horizontally on a table and ensure that it is completely level. Then with the arrowhead one meter away from the center of the rolled mat, shoot at it at full draw with your body perfectly aligned. When the arrowhead hits the rolled mat, observe whether the head had been inclined to the left or right and immediately correct the fault. Do the same for any deflection up or down. You need to do this until you can get the arrow to pass through the hole at the center of the rolled mat without making a sound. Then go and shoot outside. Just align the arrow by pointing with your foot: let your arm follow it instinctively and release, then it will naturally go off without missing.

This then is the fruit of the mature wisdom of the Master, where he marked his target point, drew his bow and achieved his unique creation.

notes

1. At the time this was written, a catty was about 597 g and an ounce was 1/16 catty, or 37 g.
2. Ba is not defined, but should represent the width of a fist, say 10 cm.
3. Compare the following from the 'Archery Manual' of Li Cheng-fen, written about the same time:

> *Thus for a bow with a draw-weight of three li, (16.4 Kg), the arrow to use is ten quan in length. The term 'quan' is equivalent to one 'ba', and an arrow of ten 'ba' has a weight of 4.5 qian (16.6 gm). A bow with a draw-weight of four li (21.8 Kg) uses an arrow length of between 9.5 ba and 10 ba, either of which is within the correct proportions, and the*

weight should come out at 5.5 qian (20.3 gm). Draw-weights of five to six li (27.3 – 32.8 Kg) also need an arrow length of 9.5 quan; and when you get up to draw-weights in the region of seven of eight li (38.2 – 43.7 Kg), you use an arrow of only 9 quan, and if the length is up to 9.5 quan, that is still acceptable.

4. According to x one pace was equal to 1.55 meters in the late Ming period
5. Compare the following from Li Cheng-fen:

   For this reason, the target has to be analyzed to get the range, and then you bow-arm is positioned accordingly. Say your target is at eighty paces, then your bow-hand should be level with your shoulder. If it's at a hundred paces (155m), the bow-hand should be level with your eye. At 130 - 140 paces, it should be level with the eyebrow. When you get out to a range of up to 170 - 180 paces, then the bow-hand has to be right up level with the top of your cap.

Manchu archery demonstration [10]




10 http://www.manchuarchery.org/technique

Manchu archery: loading and nocking arrows [11]

Unlike target archery, Qing era Manchu archery was a martial art. In practical terms, what that meant for the archer, was that he trained to shoot at a target that was shooting back. And that target, constantly changed its position. So just as Bannermen on the battlefield of Qing China, those practicing the Manchu style of archery must draw, nock and shoot without ever taking their eyes off their opponent. This method is the same for both mounted archers and those on foot.
From the beginning of this sequence, through having loosed one's arrow, one's eyes never leave the target. Standing with feet slightly wider than shoulder width, torso perpendicular to the target, hold the bow level in front of the torso at just above waist level. Then the string hand reaches back and, grasping an arrow at midsection, draws it from the quiver. (sometimes arrows were thrust in the belt).
Next the string hand carries the arrow forward underneath the bow and into the bow hand, placing it in the notch formed by your thumb and bow.

Once there, it is grasped with the index finger of the bow hand. If the grip of your bow is too thick to hold the arrow securely with just your index finger, then you can also use your thumb to hold it in place. Make sure you apply pressure directly onto the bow with the grasping finger or the arrow may slide out of place.
With the arrow now held in place against the bow, slide the string hand back down the length of the arrow and over the fletching. As your hand glides over the feathers, feel which way the nock is oriented and turn it into proper

11 Scott Rodell

alignment with the string. This is easy to do because Manchu arrows are typically fletched with the feathers aligned with the nock with a noon-3-6 feather configuration, like the tail of a plane.
With the arrow properly aligned with the string, slide it forward with the string hand and nock it. Once nocked, release the pressure of the bow hand finger on the arrow for a moment and draw the arrow an inch or so, just enough to so that there is adequate pressure between the nock and bow grasp of the bow hand fingers to hold it in place on the string. Then, with the index finger of the bow hand holding the arrow in place, the thumb of the string hand can wrap around the string, just below the nock, so that the thumb ring is against the string and the bottom of the arrow nock. The index finger of the string hand then wraps over the thumb and rests atop the upper edge of the thumb ring. With the string hand in this position, use the index finger of the string hand to apply pressure from the side of the arrow to hold it in position against the bow and release the pressure on the arrow that was being applied by the bow hand index finger. Having released its grasp on the arrow arrow, the index finger of the bow hand is pointed it straight, and forward at the target. Holding the arrow in position against the bow with the index finger of the string hand, one can now raise the bow for the draw.
Upon releasing the arrow towards the target, the string hand opens backward in a vertical arc, and then circles downward to where it can easily draw another arrow & repeat the process.

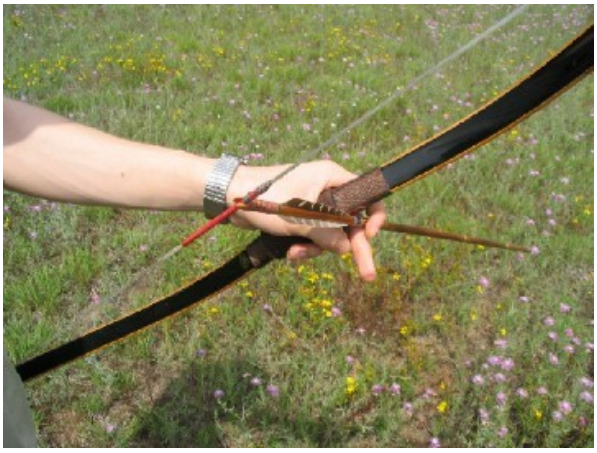
nocking point on a horsebow

Comme il n'y a pas de repose-flèche, la flèche reposant sur les doigts de la main gauche, et que la position de la main sur la poignée peut légèrement varier d'une prise à l'autre, il n'y avait traditionnellement par de nock sur ce genre d'arc. Le principe pour l'encochage de la flèche est le suivant:
1. l'avant de la flèche reposant sur la main d'arc, placer l'encoche parfaitement perpendiculaire à la corde;
2. relever l'encoche de 6 à 12mm (1/4 à 1/2 pouce).

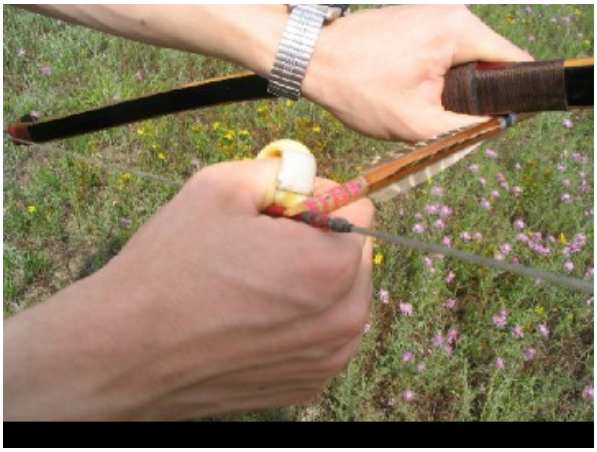
Remarques:
– avec l'expérience, les deux étapes peuvent être fondues en une, c'est-à-dire que la flèche est directement placée dans la bonne position;
– attention à ce que l'encoche soit toujours plus haut d'au moins 1/4'' sur la corde par rapport au point correspondant à un angle de 90°, cela pour permettre aux plumes de passer juste au-dessus de l'articulation du pouce, évitant les risques de blessures;
– il n'est pas interdit de mettre un repère d'encoche (nock set) sur la corde (celui du haut suffit) à condition de prendre toujours la poignée de la même façon et de positionner le doigt formant repose-flèche toujours de la même façon.

korean traditional archery

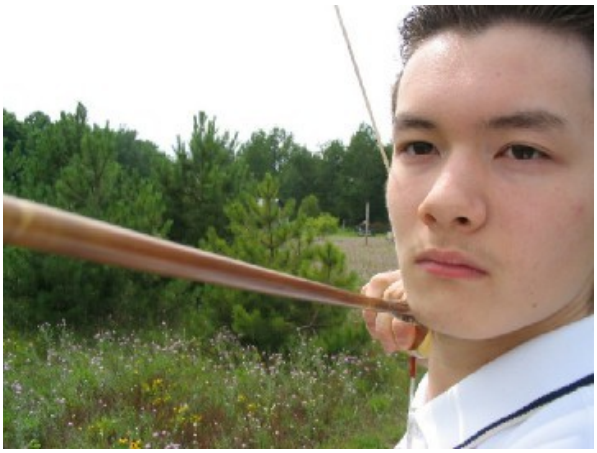
KTA demonstration [12]

	The bow handle is held and the arrow is ready to be nocked on the bow. Note that the arrow is held in the bow hand between the index and middle finger.
	The arrow is nocked and is ready to be drawn.
	The string is positioned where the ring and thumb meet.

12 http://www.koreanarchery.org/classic/thumbrng.html

	The index finger wraps around the thumb, similar to flipping a coin. The arrow rests just above the thumb and ring. The left index finger will push the arrow into the bow, so the arrow will not fall off, even if the bow is canted upside down.
	The bow is in position to be drawn and an initial sighting of the target is done.
	Close-up of hand positions from draw-hand side. The arrow rests on the right thumb knuckle.

	Close-up of hand positions from bow-hand side.
	Bow at full draw.
	Arrow point at full draw.

	Close-up of draw-hand at full draw.
	Close-up of bow-hand at full draw.
	Head-on view of archer at full draw.

	The view slightly to the side of the archer; the target is 145m in the distance.
	Archer's view of the target.
	Release and follow-through.

learning KTA [13]

As a beginning archer, you will not start shooting yet. First, you must learn how to hold the bow. We will use a modern bow for training.

The bow is gripped firmly, but not tightly. The middle, ring, and little finger are held together around the bow grip. The index finger is held a little higher and is crooked downward. The thumb is held near the top of the grip and is crooked in a little. There should be no gap between the thumb and index finger.
One thing on grip to remember, also, is to hold it diagonally in your hand with the bottom of the grip digging into the heel of your palm. Then you wrap your fingers around, starting with the pinky and work your way up to the index finger and ending with the thumb at a kind of right angle to them. The grip of a Korean bow should be placed diagonally across the palm, with the bottom of the grip pushing into the heel of the palm.

Next, you should learn how to properly draw the bowstring. The hand with which you hold the bow should be like pushing a high mountain; the hand with the thumb ring should be like pulling a tiger's tail. The bow should be pushed using the ball of the palm of the hand, with power being shared equally with the arm holding the bow from wrist to shoulder. If the bow is grasped so that the hand is bent back, power will not be distributed equally in the bow. This incorrect arm position will often make the arrow go wide of its mark. In this case, the bow should be regrasped. The knuckle of the middle finger grasping the bow should be pushed toward the target. The bow arm elbow should be straight, with the inside of the elbow perpendicular to the ground.

After you are able to consistently draw and relax the string, you are now ready to shoot a tethered arrow. The tether pole is usually made from a tall (~20ft.) bamboo shaft. A long line is attached to it and an old arrow is attached to the line, through a hole drilled in the point. Before shooting, you need the correct stance and the correct way to hold the string. Your feet should be positioned at a two o'clock position (60°). The weight of the entire body should be evenly divided between the forward and backward feet. The abdomen should be tight. If the abdomen isn't stretched to its fullest, it'll cause a loss of balance due to the haunches being pushed backward. The abdomen is naturally strained by standing with power in the legs. Correct breathing is essential. Take a deep breath, then release it slowly, emptying your lungs. The chin should be positioned by the left shoulder (right handed). The neck should be held as straight as possible.

Now you should put on your thumb ring. Fit your thumb through the outer side of the ring and twist it so the pointed end is toward the end of your thumb. Draw back on the string with it resting against the ring. Wrap your index finger

13 http://www.atarn.org/korean/korea.htm

around the end of your thumb, as though you are going to flip a coin. Be careful not to rest your finger over your thumb nail. Raise up the bow hand to the height of your forehead, straightening out the bow arm's elbow. Your eyes should steadily gaze at the target, even with the lower bow nock. The jaw should be close to your bow shoulder armpit.

When you draw the string, you shouldn't give power to the hand holding the bow first. The string should be drawn first, then power can be applied to the bow. This should be practiced until it becomes a steady, fluid motion.
The string should be drawn back slowly to your thumb ring shoulder. When at full draw, hold that position for about three seconds before releasing.
The angle at which the bow should be held will depend upon the cast of the bow. Some archers will shoot at a forty-five degree angle, while others will have a more flat trajectory. The angle can be adjusted individually.

Release is made simply by relaxing the thumb ring hand. Don't jerk it. The follow-through should be a slow back and downward motion. Now you are ready to shoot the tethered arrow. Practice this for several days.

target shooting

Now that you've practiced shooting the tethered arrow, it is time for you to shoot a live arrow at the target, positioned 145 meters (158 yards) away. Remember a few basic rules:
1. Check the wind.
2. Stand straight.
3. Breathe from your lower abdomen.
4. Draw slowly.
5. Hold at anchor for three seconds.
6. Release smoothly.

Because of the relatively large distance involved, (the target is 145 meters from the archer's shooting line), the target is quite large by western standards. It is approximately two meters wide by 2.66 meters in height.
The arrows and the targets of Korean Traditional Archery are rubber-fronted, so that the arrows bounce off the target, should they strike it. This results in less broken arrows, since archers never have to force an arrow out of the target, nor does an arrow ever become permanently lodged in the target.

draw

If you try a bit of 'air'archery' and draw your hand back, you will find a natural end to your draw. At this point the knuckle of your left thumb will be level with the point of your deltoid and there is maximum back tension. If you try to draw further, your drawing elbow begins to rotate around your body, which affects the drawing hand.

There are many depictions from the various Asiatic bow cultures and most (save Scythian) display the archer with a long draw and similarly, most arrows found have been long. Interesting that early (Scythian) and late (Turkish) cultures feature shorter draw lengths.

Most Korean archer, a bit less than Kyudo archers, can have a very interesting body position, with the draw hand far behind the ear, bent draw wrist, low draw elbow.

Draw weight consideration: … a minimum of being able to hold a bow without difficulty is important, whether or not one is aiming at something. When drawing a bow, one does not always have a situation where a target can be aimed at (for instance, in a house). If one's arm starts shaking within the few seconds of holding it at anchor, it might mean one needs to build up to that weight and start out with a lower weight.

posture and stance [14]

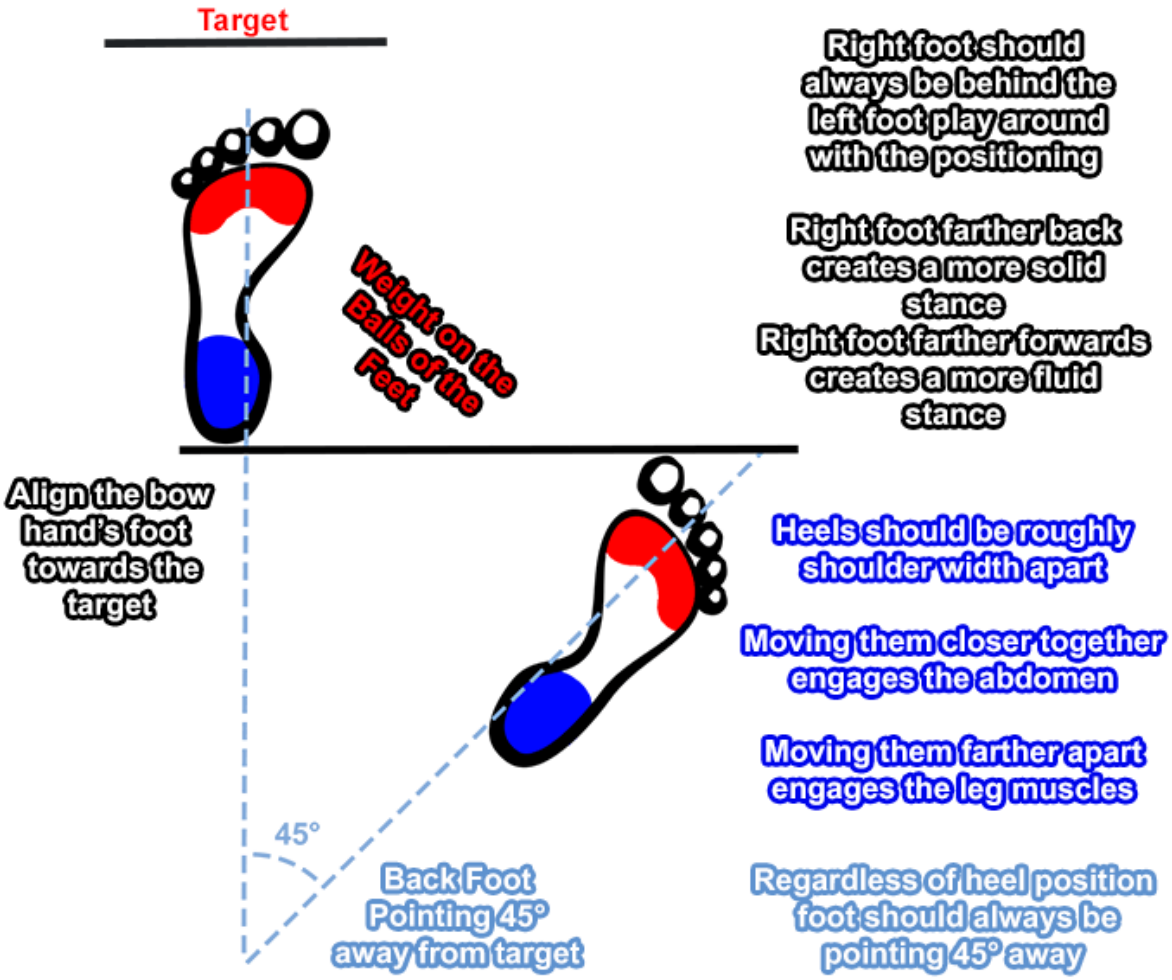
Some Korean archers seem to shoot with the shoulders sort of oblique to the drawn arrow, while others just twist their body? Isn't it way easier to use the back muscles with the left arm with a parallel than that oblique Korean stance?

A more parallel stance is more stable since your bones are doing more work, the more oblique stance requires more muscle work since it's your muscles stopping the bow arm from being pulled in.

I know each master & coach will have different preferences but they'll all stay within a similar set of ideologies and methodologies when it come to archery. All of the things you stated are all within the limitations of KTA, whether it be the type of thumb ring, how much you hook your fingers over your thumb, if you apply torque or not etc. I have yet to see a Coach stand vertically to the target and shoot a traditional Korean bow like an Olympic bow whilst they are teaching people how to shoot the TKA style, simply because it wouldn't be

14 http://www.koreanarchery.org/punbb/viewtopic.php?id=821

TKA.



I believe Korean stance is from horseback archery, which the body face targets. Koreans seemed to use different stances when they use heavy bows. But current Korean shooting technique is focused on long distance target shooting. People do not use bows heavier than 50-60lbs because even 40lbs Korean bows can hit 145m target easily. They do not really need to shoot heavy bows.
When both legs are straight and face the target, you have to use your back(spine) muscle to twist upper body and draw the arm pass the ear. You also need to have strong lower body and spine strength to do the proper Korean technique. Some people in Korea do the Korean archery to heal back problems.
Basically, Korean technique is a bit harder to learn compare to other styles. The stance is different, the grip is different (torquing the bow, and low wrist grip), and focus on long distance target shooting, etc.

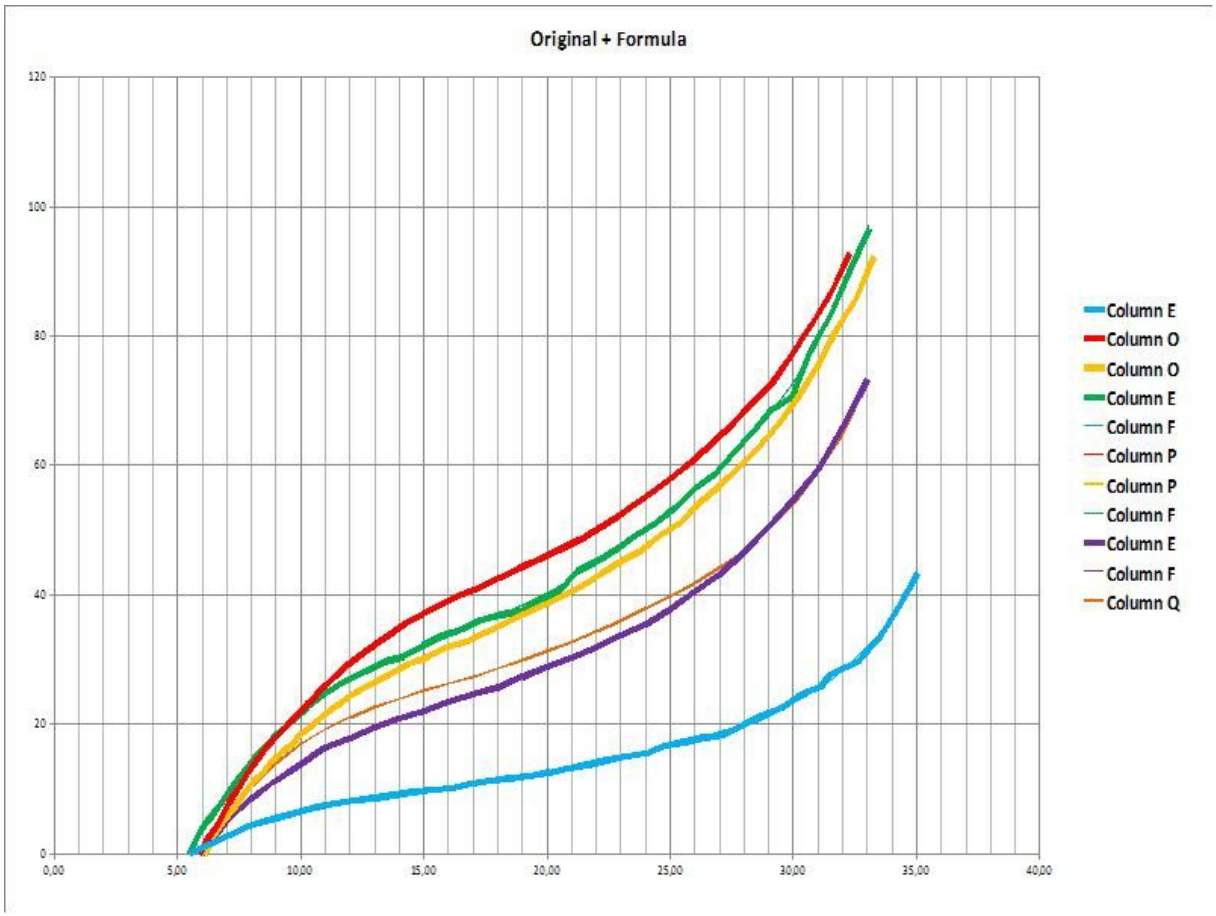
There are styles and techniques that make you hit targets 30-60yard easily compare to Korean style for sure.

I have always used the Korean stance of placing the feet but I would twist my body so that my shoulders would align parallel to the draw. This last few days I tried not to twist my body so much and the following things happened: First my draw reached farther back, far behind my ear, but the length was the same. Second I have my back hurting a lot. Third the torque technique was more natural and last my anchor point was forced higher.

energy [15]

For horsebows in general, the good ones are very fast:
short limbs = light limbs = fast.
For Asian-style reflex-recurve bows in general, you get more energy for the same draw weight (ideally, you have a quite convex force-draw curve, instead of the concave one you get with a longbow).

Graph is based on empirical data (thick lines) and mathematical equations (thin lines):



15 http://www.koreanarchery.org/punbb/viewtopic.php?id=232

red: SMG long, marked 75,5 lbs @28
draw 28” : force = 68,16 lbs, stored energy 99,23 joules
draw 29,5” : force = 74,92 lbs, stored energy 111,49 joules
draw 33” : force = 98,48 lbs, stored energy 145,69 joules

green: SMG standard, marked 70 lbs @28”
draw 28” : force = 63,47 lbs, stored energy 90,53 joules
draw 29,5” : force = 70,31 lbs, stored energy 102,01 joules
drawe 33” : force = 98,48 lbs, stored energy 134,69 joules

yellow: YMG standard, marked 65 lbs @ 28”
draw 28” : force = 60,55 lbs, stored energy 84,08 joules
draw 29” : force = 64,86 lbs, stored energy 91,26 joules
draw 33” : force = 89,96 lbs, stored energy 126,08 joules

brown: SMG long, marked 50 lbs @28”
draw 28” : force = 47,05 lbs, stored energy 69,46 joules
draw 29” : force = 50,02 lbs, stored energy 75,04 joules
draw 33” : force = 72,97 lbs, stored energy 102,46 joules

mauve: SMG standard, marked 49 lbs @28”
draw 28” : force = 46,67 lbs, stored energy 63,67 joules
draw 29” : force = 50,47 lbs, stored energy 69,24 joules
draw 33” : force = 73,22 lbs, stored energy 97,00 joules

blue: SMG standard, marked 22 lbs @28”
draw 28” : force = 20,08 lbs, stored energy 29,69 joules
draw 29,5” : force = 22,41 lbs, stored energy 33,45 joules
draw 33” : force = 31,92 lbs, stored energy 44,32 joules
draw 35” : force = 42,64 lbs, stored energy 52,85 joules

torque: how to get arrows to shoot straight [16]

If you constantly find that your arrows shoot right, follow my guide below to get your arrows shooting straight.

Step 1: Establish correct arrow spine
Most Western style arrow charts do not apply well to the Hwarang. So you will have to do it with a little trial and error.
a) Begin by using your current arrows. Draw and shoot as per normal. If you arrows go right, proceed to b
b) Draw your arrows back a little further then your normal draw length (we are talking millimeters here, e.g. 4-5 mm) and release. Repeat the process a few times, drawing a little further back each time i.e. 4-5 mm. Provided your arrows are long enough (31-33.5”), you will eventually reach a point where your arrows start to fly left. Once this happens, you know your arrows are in the correct spine range for your bow.
c) On the other hand, once you’ve reached maximum draw, i.e. you’ve run out of arrow length to draw and your arrows are still flying right, your arrows are either too stiff or your arrows are not long enough, or, you are not drawing to your full draw length (I believe the max arrow length in trad Korean archery is around 33-35”, so use this measurement as a guide). You will either have to swap out the points with heavier ones or get softer spined or longer arrows of the same spine as your current arrows.

Step 2: Establish correct & consistent draw length to ensure correct dynamic arrow spine in flight.
a) Once you have found the right arrows to use using the above method, go on to step b
b) Start with your normal draw length and release an arrow. Repeat the process by drawing the bow further and further back - by about 2-3mm more each time. This can be a tricky process and a little patience is required.
Best way to do it is to mark out the last 1-2 inch of your arrows in 2-3mm increments and get a friend to spot for you with the markings against your bow thumb knuckle as a reference / anchor point. Again you will find that once you get closer and closer to that sweet spot in draw length, your arrows will start to fly straighter and straighter down range. Choose the draw length that gives you the straightest flight down range and mark it on your arrow. You have now established the correct draw distance that will give your arrows the straightest dynamic spine as they are shot.
c) Then using some thick sewing threads, super glue them on the point that you have marked. This will be your anchor point from now on. Do not worry about the threads coming off, they won't.

You should now be able to shoot your hwarang by aiming it directly toward the

16 http://www.koreanarchery.org/punbb/viewtopic.php?id=370
http://www.archerytalk.com/vb/showthread.php?t=3712322

target and watch your arrows fly centered from now on.

Yes, the issue can be solved like this. But the nice part about shooting with the thumb ring is that it is possible to shoot a wide range of arrow spines and draw lengths without affecting accuracy.
The western technique is aligning the arrow with the target when the arrow is at full draw. The grip on the bow is relaxed, without any torque applied, which keeps the bow in the direction of the target at all times. When the arrow is released, it will deviate from the desired direction. This is overcompensated by using the "correct" spine.
A better technique (but much harder), is to keep the arrow aligned with the target at all times, even after releasing the string. In order to achieve this, the bow must be moved "away from the arrow", by rotating the grip. The correct torque applied to the bow will get almost any arrow to fly straight.

One of the most important techniques of the art of KTA is the torque technique. In order to avoid the arrow slamming on the bow and tilting while in mid air (something like fish tailing) you must get the bow "out of the arrow's path". You only need a fraction of an inch clearance, but to accomplice this you need a follow through that is fast enough to work on the arrow leaving your bow at 180fps. The rotation of the bow in my grip is the "side effect" or the follow through if you may, thus the name "torque technique".
But how much torque should we apply to the bow handle? The answer is that it varies based on arrow spine and draw weight, although not too much. Also, here is where arrow spine comes into play, but in a different way from the western style. The bow string will not always follow a direct line from the arrow nock to the bow handle. A stiffer arrow will tend to keep its direction better and therefore allow for a bigger variation of bow limb to string angle (as seen from above), especially at full draw. Also, a weaker bow allows for the same thing. Another variation is the position of the arrow nock at full draw, which may not be in the same plane with the bow limbs. This can be used to compensate the initial deviation of the string when it leaves the thumb.
Of course, there are a lot of variables to consider, and good shooting will depend on getting everything right. This is very different to western archery where a good setup alone can solve this aiming issue. Remember: The arrow is the barrel of the gun, not the bow!

So what you are saying is to use bow torque to compensate for arrow drift to the right? If you over torque the bow, would that send the arrow off target? e.g. to the left?

Yes, but only a bit, and especially with low spine arrows. The amount is much less than they tend to go to the right. Just squeeze the bow a bit more and torque is created as you draw. You don't need to actively rotate the wrist.

So in short, align arrows straight on with target, then shoot and torque bow

anti-clockwise by squeezing bow handle.

It does seems to me the only way one could hope to apply torque quickly enough to affect the arrow as it leaves the bow is to pre-apply it in the grip

YES! The tricky part is applying the same torque every time.

It works! I spent much of Friday evening twisting the hell out of my 45#@28” YMG Hwarang laterally and forward as you described while shooting at 30 meters. The LED lit nocks I use to check flight out of the bow flew much straighter, some like bullet tracers. They normally wiggle out of the bow and stabilize at about 20 meters due to the helical fletching. The Hwarang was performing like a centershot bow.
I think I understand what you’re doing now. You’re creating a dynamic centershot arrow release with this bow handle twisting technique. The dynamic is a second force vector applied to the arrow nock by the twisted limbs releasing their stored energy. It is at a right angle to the main force vector applied by the limbs returning to brace position when you release the string. It has to be applied precisely in the same 10-20 milliseconds that the arrow nock is still in contact with the string after release or it has no effect. You have to move the launching arrow nock about 1.25 cm or half an inch to the right before it leaves the bow. That will put the back of the arrow in alignment with the path of the front of the arrow as it leaves the bow. The arrow will fly straight regardless of its spine. It just requires a little twist of the back of the bow handle to the right during that fleeting instant. The problem is that no human being can contract their muscles that fast no matter how strong or quick they are. But you can make the bow move that fast by pre-twisting at full draw and suddenly releasing stored elastic energy in the twist. I was wrong before about the stored energy being in the connective tissue of the hand and wrist. It’s in the bow, in the twist maintained by holding your anchor at full draw.

If the torque was so great to be visible before the arrow leaves the bow (there is no riser - its not a take down) the string would send the arrow sideways. Imagine a crazy bow spinning around with the arrow still attached on it! That's not what we want. We want a clear release and the torque much just begin to take affect as the arrow leaves. All the rest spinning around is just follow through because of the momentum. The hand that grips the bow, holds the bow straight but builds up tension to rotate it (torque) before the release, when the thumb releases the arrow, the bow hand's build up tension torques the bow just the slightest so as the arrow doesn't need the paradox and spine to go around the bow.

I apply torque before I release. The bow stays still because it is drawn but my hand is twisting way before I release. The moment I release simultaneously starts the torque slowly at first. That small tiny rotation is enough to clear the arrow path, the rest is momentum. Maybe I am doing it wrong but Gungdo,

Kyudo, Manchurian and Turkish archery and others has been and still are using the torque technique not with reenactment or research or historical archery but with actual tournaments, clubs, federations etc. Some archers reach way over 400 meters range at flight archery due to techniques like it.

Interesting technique, but I find that my best shooting with Asiatics is with a loose, open grip, and minimal contact with the bow hand (pretty much just the base of the thumb) - almost exactly the opposite of this. The idea is to reduce torque as much as possible, which seems even more important than usual in these shorter bows. Just seems to work for me, but then I shoot Mediterranean and afoot.

I have seen traditional archers allow the bow to rotate along the vertical axis, particularly Japanese, though in their case it seems to be a side effect of a loose grip rather than a deliberate attempt to introduce torque. Perhaps a deliberate outside torque acts as a form of follow through. And I'll admit the loose, open, minimal contact grip might be impractical if your archery practice involves riding across the steppe with a few thousand buddies looking for small towns to pillage.

What are the characteristics of a Korean bow that makes this technique unique to that bow. Would the technique work with an English longbow or a Manchu bow or a Scythian bow?

It does take very flexible arrows to fly true out of most Asiatics. I have two Magyars and a Kaiyuan bow in the upper 40# low 50# range that only shoot straight with 32 inch, 700 spine, 175 grain tips. You have to really look to find the bits to put together arrows like that. I'd be completely unsurprised to find longbow folks have the same issue.
I've always figured the horseback guys have to maintain a death grip on their bows. Not much choice, if you think about it. They may well have come up with techniques to try to mitigate the inevitable issues one would see from maintaining a fierce, full palm contact grip on a short bow with low brace height. There are at least two torque techniques in use among these folks: one flipping the bow forward for additional speed, and the other the torque to clear technique to try to get the arrow around the grip. Enough folks swear by these techniques that there is probably something to them. But from a functional standpoint, they're almost certainly not necessary if you simply avoid the mounted death grip. I honestly do not know if non-mounted Asiatic shooters used a loose grip or if they always went with what they'd have to do mounted. For those of us not dealing with having to keep the bow from jarring out of our hands as we gallop across the dusty steppes, a loose, minimal contact grip and flexible arrows work well. I suspect the same probably applies to longbow folks.

I have a Samick SKB which is Korean Horsebow but not a true KTA bow, BUT

still I have shot with it successfully with the torque technique. But be careful, you may twist your bows limbs, KTA bows have special ears and SKB has wide limbs, a longbow could be broken with this technique! WARNING! So you take your bow and grip it with you right hand but with the three last fingers, your thumb and index don't grip the bow. You nock the arrow on the right side and it rest on your thumb, you draw (preferably with a thumb ring, but maybe it can be done with fingers too) and before you shoot you but pressure on the bow so it will turn anticlockwise. It will not turn then, but you keep pressuring it to rotate until you release, then it will turn automatically. I recommend using little force because your bow could break or limbs twist and hurt yourself.
PS. If you shoot on the left side you can not torque the bow, clockwise is your arm that will stop the string, anticlockwise the bow will hit the arrow instead of clearing the arrow path.

The forward flip is deceptive. It's not pushing the arrow forward. It's more a biomechanical consequence of good push-pull and back tension mechanics, while maintaining a firm grip on the bow. In of itself that does increase speed by keeping a good draw length and clean release. So the follow through motion of the bow hand isn't a deliberate technique in of itself. It's the RESULT of a technique. Kind of like how a dynamic string hand comes back after you let go. It does that because you used back tension and didn't tense any muscles that didn't need tensing. So it comes back naturally on its own.
But there's more to the "forward khatra" than that. There's some visually subtle sideways torque occurring as well, albeit not quite as much as with pure "torque-to-clear". But it's acting on the exact same principle and doing much the same thing. Getting the bow out of the way of the arrow, straightening early arrow flight. In other words, conservation of energy, not addition of energy. Reducing fletching drag, avoiding the arrow slapping the riser, and keeping the arrow square to the target for better penetration.
We don't have equivalents to torque-to-clear in western archery because to achieve the same effect we'd have to rotate the bow in the other direction, slapping the wrist. But the fact that we emphatically stress torque free grips should show us that torque certainly has an effect on arrow flight.
Also, if you watch modern Mongolian archers shoot, a lot of the ones who shoot thumb on right are doing a khatra-like follow through, while the ones who shoot thumb on left are keeping a static bow hand. Thumb on left doesn't experience paradox (the arrow always flies to brace height direction, so they have to aim to compensate), but the arrow flight is inherently very clean, so doing khatra/torque is unnecessary. No need for energy conservation.

I suppose an effective torque-to-clear technique might at least relieve the archer of obsessing over dynamic arrow spine. As someone with five sets of arrows for different bows, contemplating a sixth set, I can appreciate the concept of rotating the bow out of the way rather than worrying about finding just the right arrow / point combination that will clear a grip up to 1.5 inches wide depending upon the bow.

persian / arab / turkish archery

Saracen archery [17]

grip and grasp

The grip should be right for the hand, neither too big nor too small. Grasp it with the whole hand after first pushing back the flesh of the palm away from the base of the fingers into the center of the hand. Look to see whether the tips of the fingers touche the heel of the hand. If they do, then the grip of the bow is too thin for the hand. If there is a finger width or less between the far border of the finger tips and the heel of the hand, the size is just right. A greater or lesser gap is unsuitable.

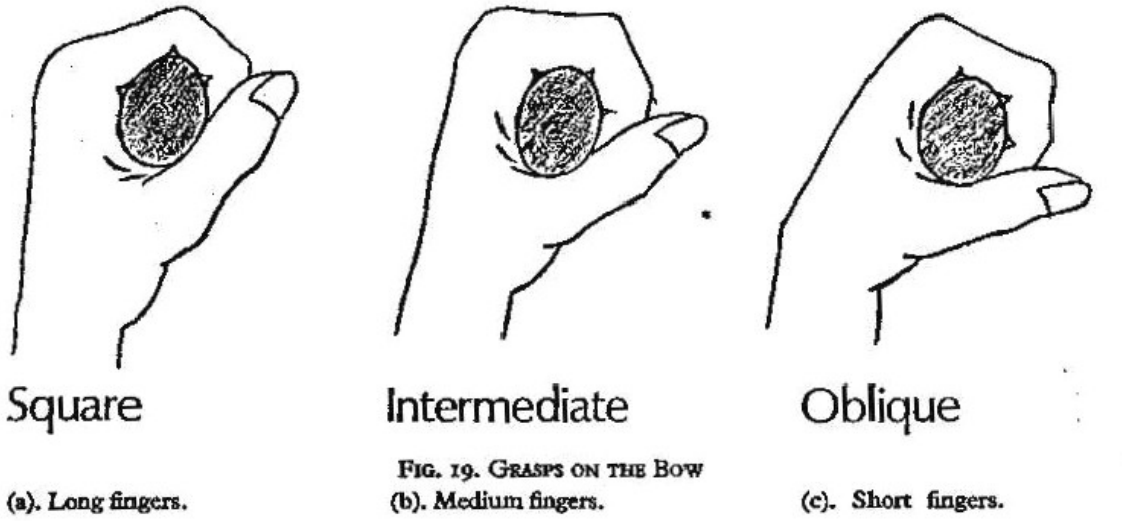


FIG. 19. GRASPS ON THE BOW
(a). Long fingers. (b). Medium fingers. (c). Short fingers.

In case of a big palm with long fingers, the spine of the *matn* [définition plus loin] must be placed centrally in the middle crease formed by the fingers [entre la 1e et la 2e phalange en comptant depuis la base près de la paume: cf. fig. a].
A man with short fingers should put the spine of the matn in the first crease (the one lying between the base of the fingers and the palm: fig. c).
A man with middle sized fingers should place the spine of the matn of his grip in the center of the proximal phalanges [1e phalange en comptant du bas]

matn = middle of the back of the grip = center section of the dorsal surface of the handle which the archer grasps when shooting.

Once the bow has been placed in the appropriate hand with fingers outspread, the bow should be grasped with the little finger followed by the ring finger then the middle finger. Pressure should be highest with the little finger, followed by the ring finger until the pressure reaches its lowest in the middle finger. The pressure exerted by the grasp should be highest the very moment the arrow is loosed.
Once you have a tight hold on the grip, gently curl over the end of the index

17 Latham & Paterson

without tensing it in any way. Fasten it only loosely on the grip, for if you tense it, the other 3 fingers already tensed will relax and you will impair your grasp.
Having bent over the end of the index, place your thumb upon it in contact with the grip. Your thumb must lie still and shall not be pressed into the grip because it forms the guide for the arrow, and if tensed the arrow will blister it. Tensing of the thumb will also slacken the grasp.

Try to apply your grasp to the middle of the grip so that the space remaining at the top of the grip should be the same as at the bottom. To have more or less is incorrect, although no harm will be done if the upper space by which the arrow passes is just a little bigger than it should be.

Some archers run the shaft of the arrow over the proximal (1st) phalanx of the thumb. This is a perfectly good technique. Other run it over the index and slant the thumb towards the arrow.

nocking

While nocking, keep your eyes on your foe.

One way of taking the arrow prior to nocking is to take hold of it (nock towards the elbow) with the palm and all five fingers of the right hand as if you where taking hold of a stave.
An accomplished archer will take hold of the shaft with the middle finger, thumb and index, and have the arrowhead in front of the end of his fingers. The arrow in this case is held at a point two thirds of the distance from the head, the remaining third coming up towards the forearm through the center of the groove formed between the right index finger and thumb. The effect will be that of a scribe taking hold of a pen.

Hold the arrow in position with the fingers of your left hand: hold the shaft with the left thumb, index and middle finger against the grip of the bow.: cf fig. f22 § thumb draw.
Once the arrow is held in place against the grip, run your right hand fingers over the shaft to see whether there is any fault.
Continue to run your fingers along it until the nock finds its way into the center of the middle phalanges of the middle and index finger, and the proximal margin of the distal phalanx of the thumb.
Alt: after running his hand down the shaft, the archer could hold the nock:
1. between the index finger and the thumb with the notch against the distal phalanx of the middle finger [dernière phalange],
2. with the middle phalanx of the index, the fore part of the thumb, and the tip of the middle finger,
3. between the index and thumb with the notch between the first two phalanxes ot the middle finger.

Then, with fingers pressing on the nock, give the end of the shaft one shove

with the right hand and bring back the left, which is holding the bow, without allowing the string, against which the arrow is running, to leave the shaft until the string comes in under the thumb and rides just clear of the nock.

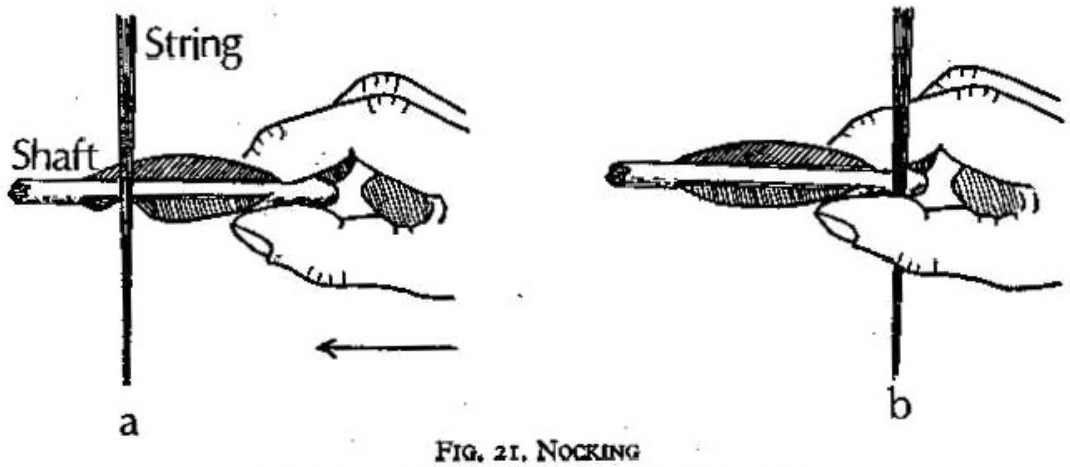


FIG. 21. NOCKING
(a). Running the shaft forward against the string.
(b). String running under the thumb.

You then move both hands back (i.e. in the direction from which they came) and slip the string into the nock, still keeping your eyes on your foe. In other words at no time time do you look at the nocking operation, but rather keep your eyes all the while on the mark at which your are about to shoot.

arrow rest

The arrow rests on the knuckle of the thumb:

locking

lock 69: gather the little, ring and middle fingers of the drawing hand into the center of the palm and then conceal the finger nails. Next place the tip of your thumb in the center of the middle phalanx of the middle finger and wrap the end of the index over the base of the thumb nail (the base being the side where it commences growth). Precisely place the middle phalanx of the index finger on the junction of the nail and flesh of the thumb. See that some nail remains visible
If the little, ring and middle fingers are strongly pressed home, an extremely firm lock will follow. It is upon the pressure of these three fingers with concealment of the nails that a good strong lock depends.
The real art of locking lies in pressing the end of the right index on the thumb without too much bending, for if the index bends and curls around the thumb, it will not respond as it should upon release.

You may also use the pillion lock which is well suited to bows that are strong, stiff and powerful, but it gives a slow release. What you do is to lock as already indicated but then mount the middle finger on the index finger and place it on the thumb beside it.
You may also use the lock 63, which the same as 69 except that the nails are visible.
The lock may be varied to suit the individual, but the nock of the arrow may not be shortened to suit the lock. That is: if as a result of the lock you adopt you find the end of the nock pressing against any part of your thumb or index, you must not shorten the nock to remove this pressure, you must either take a different lock or accept the pressure.

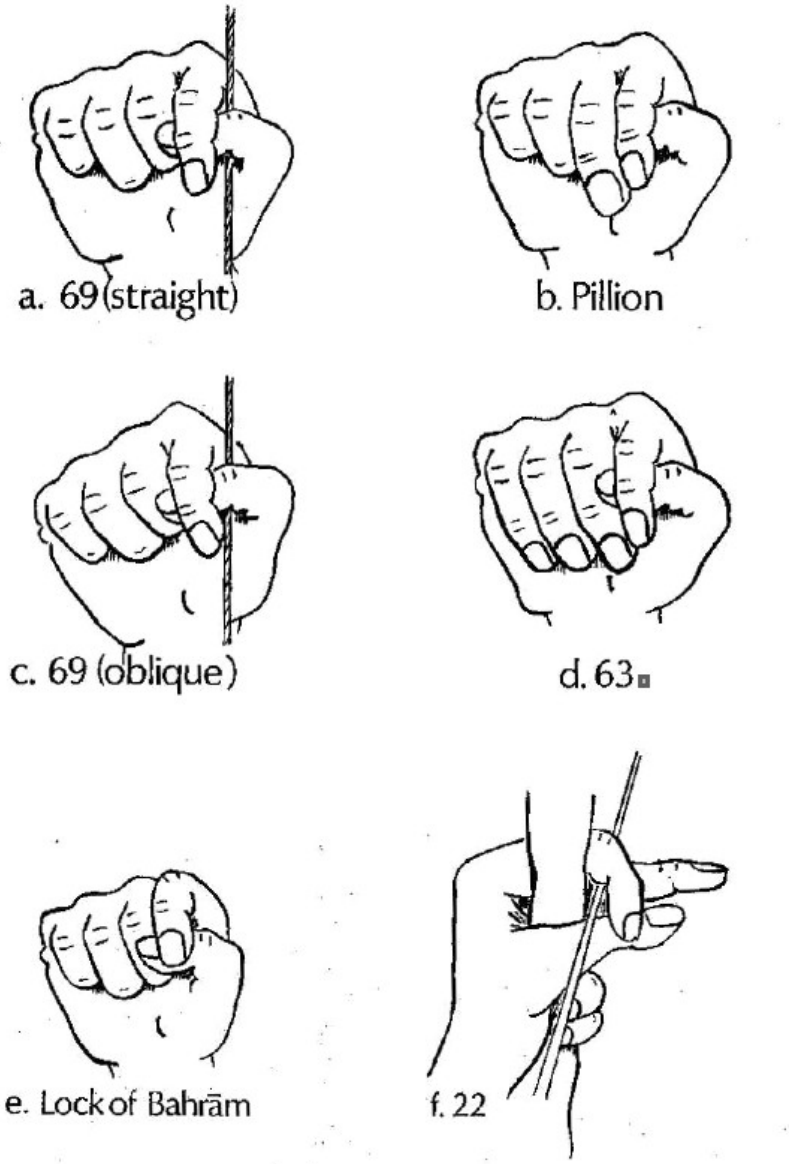


FIG. 22. LOCKING AND COUNTING

A straight lock gives a steadier draw, and an oblique a speedier dispatch of the arrow.

the draw

Draw smoothly and easily with equal distribution of weight between both arms. Since the strength of the draw comes not from the arms but from the muscles of the back and shoulders, keep the right elbow in the same horizontal plane as the shoulder while drawing.

Three basic methods of drawing:
1. with hands relatively close together at waist height, begin simultaneously to push against the bow, pull on the string, and raise the hands;
2. raise the bow hand almost fully extended toward the aiming point with little disturbance of the string until that arm is level, and then draw;

3. raise both arms above the horizontal and draw while lowering the hands to the correct elevation.

sighting

When an arrow is drawn to the ear or whereabouts, its tails, or nock, is displaced to the right of the line of sight as given by the right eye. This displacement is roughly equal to the width of the bow. For an accurate shot, the left edge of the bow must be in line with the target. To aim this way is to aim outside the bow.
When the arrow is drawn to the chin, its nock should lie in the vertical plane beneath the right eye, and the line of sight thus runs along the line of the shaft. In this case, the right edge of the bow must be aligned with the target. This is aiming inside the bow.

External sighting can be done in 3 ways:
1. You look askance [obliquely, sideways, indirectly, out of the corner of one's eye] with both eyes, bringing the pupil of the left eye into its exterior angle and the pupil of the right eye into its interior angle. Aim with them both as with one eye.
2. The arrowhead lies outside the bow in line with the mark while the archer looks at the mark with both eyes and aims with the left.
3. Use the left eye to aim and keep the right eye on the limb of the bow without using it to sight any part of the mark, keeping the knuckles of the left hand in line with the center of the mark.

The japanese draw roughly as far back as the right shoulder and consider that the ideal aim is achieved with the left edge of the bow running through the center of the target. If this cannot be done, the bow may be displaced either to the right so that the target may be viewed well to the left of the bow, or to the left so that the target is obscured by the bow as viewed by the right eye.

Some archers gauge elevation and direction from the beginning of the draw and make continual adjustments until the moment of release. What you do in this case is to train the arrowhead on to the mark, gauge precisely, and draw.
Alternatively, you can sight the mark first and, when you have drawn half the arrow, gauge precisely and at that instant bring the arrow to full draw and release.
Others only gauge at the end: elevation and direction are not precisely gauged at the beginning of the draw, and when a fist’s length of the arrow remains to be drawn, the archer holds for a moment, sights, and, snatching rapidly, releases. This is the military technique of far greater value than the others described.
You may also gauge by taking the process from the moment you begin to draw until full draw is reached, then giving a quick release. This is an excellent method for target shooting.

the loose

snatched loose
The bow is drawn and then comes a pause before full draw is reached; this is immediately followed by a quick snatch. The archer draws until a small portion of the arrow remains, and then, holding briefly for the count of one, he snatches the remaining portion of the arrow and looses with a snap of the fingers from the inside of the string. At the loose, the part of the arrow that remained at the hold should have been grabbed back with such rapidity as to be imperceptible to the bystanders.
Fast loose, danger of creeping minimal, but liability to errors and variations of draught. This is the finest loose for military purposes.

held loose
The full length of the arrow is drawn to its limit and, when the hands are motionless, the arrow is released. In other words, the archer should draw until there is nothing left to draw, hold with firm control for the count of one, two, three but not more, and loose. It is a good technique for shooting at targets.
At the stage 'hold', there is great danger that the arrow will creep, or nose forward, either because of a slight bending of the bow arm or an easing of the shoulders occasioned by muscle strain.

The hand must not go forward with the string, and the loose must be clean and unvarying.
Variations in the loose from the thumb lock result from two main causes: variations in the pressure of the thumb tip against the middle finger, and hence in the degree of tension in the muscles of the thumb; variations in the pressure of the index on the thumb nail and the manner in which it is released.
With a thumb lock, effective loose depends on clean and rapid disengagement of the thumb from the string. It is not a simultaneous disengagement of thumb and index but a rapid sequence.

The position of the hand after release should be such that the right index and thumb lie by the ear in the form of a crescent, this being achieved by an upward and outward twist of the wrist that will reverse the position of the hand and thus leave the little finger uppermost. This action should be part of the loose and there should be no lag between the two.
To accomplish the loose, the index and the thumb should be opened in rapid sequence. As far as the twist is concerned, it is essential that the movement should come from the wrist. One further point: the archer will find great help, when loosing, to open his middle finger along with his right index and thumb.
The loose should be accomplished with a backward punch of the right elbow, as though the archer were jabbing someone behind with his elbow.
Some archers open out the forearm as they loose. The first method is safer and sounder. By this twist, the index can be swept clear of the string, so there is no risk of deflection of the string slightly touching the tip of the index, even inflicting injury.

list of 34 points to consider

In the various parts of the body, there are 34 points to consider. If a state of relaxation supervenes in any point of tension, or a state of tension in any point of relaxation, certain faults or injuries follow.

20 are points of tension:
– 8 in the right arm: little finger, ring finger, middle finger, thumb, wrist, elbow, upper arm, upper part of the forearm
– 6 in the left arm: little finger, ring finger, middle finger, wrist, elbow, muscle in the lower part of the forearm
– 6 in the body: right flank, right shoulder, right and left shoulder blades, spinal column, belly

11 are points of relaxation:
– 2 in the right arm: index finger, middle sinew of the forearm
– 3 in the left arm: index, thumb, the head of the forearm (end of the radius, wrist)
– 4 in the body: left shoulder, left side, waist, neck
– 2 in the head: the lips

3 points of stillness: heart, lungs and eyes

drawing in the bow

Ottoman Turkish archery bow drawing technique [18]

In fact, the principles are general archery principles, valid for all types of archery, not just Turkish archery.

The (common) wrong technique (A)
I will start with a common mistake which one sees a lot among beginners and today's horsearchers. While pulling the bow, the elbow is often kept low or horizontal. This has many implications:

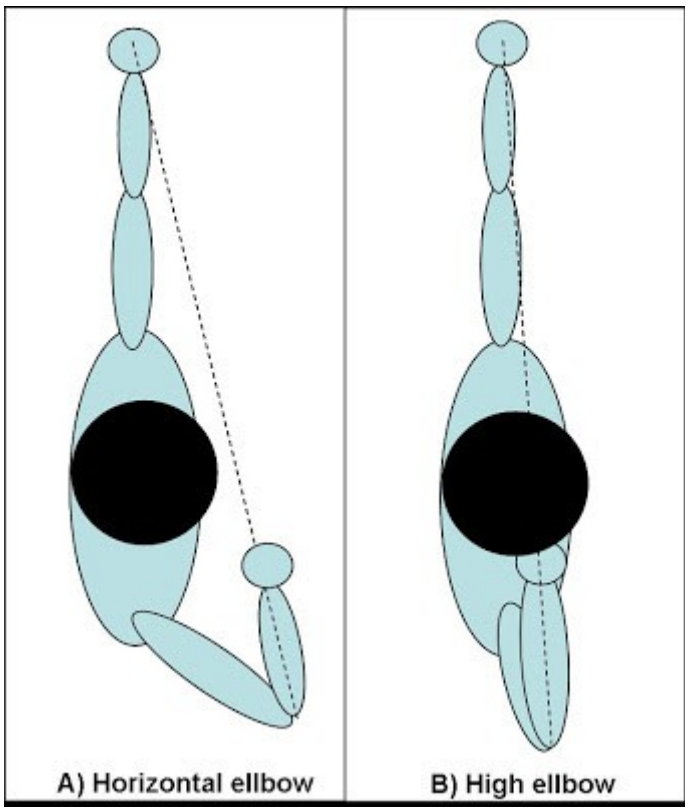
1. You cannot use your back muscles properly
2. You have to use mostly the wrong muscle - the biceps
3. No anchor point possible. In order to anchor near the face e.g. chin, ear etc you would have to use your biceps, but this will be extremely difficult.
4. The arrow is less aligned with your bow arm and eyes

Imagine a vector/line of power like in the drawing below. The two end points are your bow hand and the tip of your elbow. Your draw hand has to be on this vector as only in this position you do not need to use your biceps. This is the reason why a lot of people cannot come to their anchor point as they struggle to position their draw hand near the face, as this is a deviation from the vector. This is also the main reason why full grown men struggle with 50lbs and higher while in Ottoman times 70+ lbs was the norm (only children, beginners and elderly would use below 70lbs bows). Why use your biceps and struggle with 50lbs if you could use the correct technique and back muscles and go easily beyond 70lbs?

The correct archery technique (B)

1. Start drawing your bow
2. Keep your elbow high at the earliest stage
3. ''Roll your shoulder'' as the English longbow archers would say
4. Come to an anchor point, press your draw hand against the tip/edge of your chin for an Ottoman anchor point. The elbow should point upwards
5. Release: with the released energy, the elbow goes back vertically in a quick move but stops abruptly above shoulder height. Do not activate muscles to throw your arm back but use muscles to stop the backwards move.
6. Upper and lower arm end in a vertical position in an approximate 90 degree angle. If the draw was correct, the position of the shoulder blades will be correct and with the release the backwards moving arm will be vertical too.

18 http://turkishflightarchery.blogspot.fr/2013/02/ottoman-turkish-archery-bow-drawing.html



The anchor point depends on the archery culture and occasion e.g. it is mostly the chin for Ottoman battle archery whereas it is the earlobe for Ottoman flight archery. Seljuks, Persian Safevids, Mughals, Mongols and Tatars had a longer draw and their anchor point ranged from under the ear to above the shoulder of the draw arm.

english longbow drawing technique [19]

I admire the English Longbow archers in many ways. They are one of the few groups within the archery world who do archery as historically accurate as possible. This includes arrows, hand forged historic arrow heads, shafts, fletchings, nocks, the bows, bow design, bow length and also historic draw weights and the technique to pull and release. The draw weights they use are typically from 100lbs to 160lbs with some individuals shooting even more powerful bows. One thing they always say is the "Drawing in the bow".

What does "Drawing in the bow" that mean?
Imagine a heavy metal door with 2 sides sliding sideways to open. You can stand at arms length and try to pull them apart, but you will not be successful. Go half a step forward, arms are bent now, you will have more power to slide the doors apart. If you continue this example you will see that you can transfer energy most if you are really close to the door, basically if your chest touches it. Same way with a bow, the closer you come between bow and string, the easier it will get, the better you are going to be able to use your back muscles.

19 http://turkishflightarchery.blogspot.fr/2012/10/drawing-in-bow.html

Why is it important?
Because this is the only way to pull a bow with historically authentic drawweight. This is archery. There is no other way.

Why are the English longbow archers the only ones telling this?
Because they are the only ones using historic draw weights. For bows lower than 50 lbs you can use any technique. And that's what you see mostly e.g. in traditional shoots or horsearchery tournaments, people pull their 30 lbs bow not with their proper back muscles but often just with their wrist, or pull it in front of their faces calling it "floating anchor". This is not historic and you can only do it with low poundage bows.

What is the sequence of the pull?
When you start pulling you put your string arm elbow high and while pulling you bring your chest (or rather the line between your 2 shoulders) as close as possible to the bow. Almost as if you are "stepping into the bow". It is important to do this as early as possible in the draw. This way you will "roll your shoulder" as the English longbow archers say.

Why am I telling you all this?
It is exactly the same in Ottoman/Turkish flight archery. High drawweights in order to shoot farther, the only way to pull these bows is to use a proper technique where you use the correct muscles. The English call it "Shooting or Drawing in the bow", others might call it differently but for certain this is the way to do it.

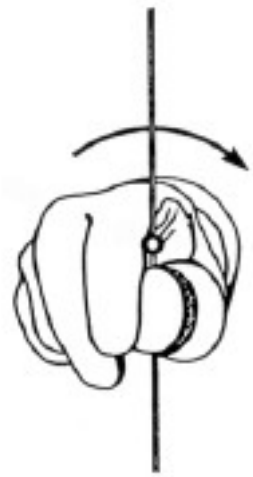
miscellany

kyudo

Japanese kyudo is very different from other asian archery traditions. Several books deals with it in detail. Let just keep these useful informations that make sense with other traditions less ceremony oriented.

thumb draw

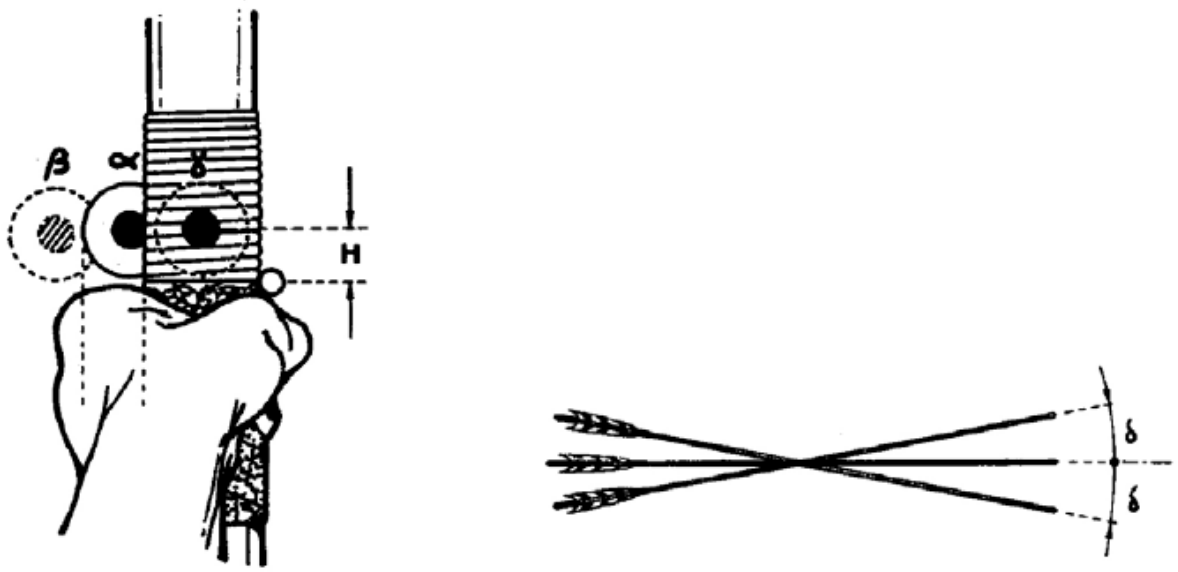
The thumb of the right hand must be perpendicular to the string. The arrow must be pressed against the bow by a slight counterclockwise rotation of the right forearm.



Remarque: ça permet de bloquer la flèche et lui éviter de glisser le long de la corde, particulièrement en l’absence de nock-set.

aiming

Due to the position of the bow the right eye's view of the target is obstructed. Using both eyes the bow often appears to be transparent and depending on the archer's stance it is possible to use one of 3 correct views:



H depends on the draw weight of the bow and the weight of the arrow which together with the draw length and the distance from the target influence the inclination of the arrow d

Kai: extension complète ou union

Kai est cette étape où l'arc est bandé à son maximum, et où le Kyudojin semble faire une pause pour viser, mais où en réalité il poursuit l'extension de son corps et de son esprit dans toutes les directions. *Tsumeai*: la puissance physique est maximale tandis que la ligne du cou et de la colonne vertébrale s'étend doucement verticalement et que la ligne de la poitrine, des épaules et des bras fait de même horizontalement. *Nobiai*: c'est le travail de l'esprit qui, assisté par cette force physique, s'intensifie et grandit pour atteindre ce point d'énergie où le lâcher sera inévitable. L'action de viser la cible a bien sûr lieu, mais si elle est faite véritablement avec les "yeux de l'esprit", elle a commencé dès la préparation.

Savoir contrôler sa respiration en kai est sans doute l'un des problème les plus difficiles à résoudre dans l’étude du kyudo. La plupart des maîtres sont d'accord sur ce qui se passe à ce moment, mais leurs méthodes d"enseignement varient considérablement La chose se complique du fait que le même maître peut donner des explications différentes à des étudiants selon leur niveau de compréhension. Les uns disent qu'il faut retenir son souffle en kai, d'autres qu'il faut expirer lentement. D'une certaine manière. les deux explications sont justes. Si nous laissons s'échapper trop d'air en kai. nous courons le risque d'anéantir tsumeai et nobiai. C'est pourquoi un maître peut dire à un élève de retenir son souffle en kai pour surmonter une tendance. Mais par ailleurs. si l'on s'efforce de retenir son souffle dans la poitrine, on risque un état proche de la suffocation. Dans ce cas, le maître dit à l'élève d'expirer. La vérité se trouve cependant entre les deux extrêmes. Au moment où l'on termine hikiwake (tendre l’arc), il faut faire passer l’air qui est dans le

haut de la poitrine dans la partie basse de l'abdomen. Pour cela, il faut veiller à ne pas trop remplir la cavité thoracique. Alors, lorsqu'on est en kai, on devrait avoir le sentiment que l'air qui s’échappe du corps fait partie de nobiai. Tout cela doit se faire de façon imperceptible. Peur-être que la meilleure description est de dire que l'on expire à travers la peau.

Hanare: lâcher

Si le kai recèle l'essence du kyudo, hanare révèle son mystère. Hanare relève du miracle, il est à la limite de l'entendement. de telle sorte que le seul moyen de le décrire est d'en parler par analogie. On compare hanare au moment où le silex et le fer s'unissent pour créer une étincelle, ou à l'instant où la neige tombe d'une feuille sous l'effet de son propre poids. Les deux images veulent illustrer combien il est important que le lâcher soit naturel et spontané. Mais alors, si le hanare est si difficile à comprendre comment peut-on apprendre à avoir un lâcher correct? La meilleure méthode est peut-être de penser à ne pas lâcher. Cela permet d'ordinaire de maintenir l'esprit fluide assez longtemps pour permettre au lâcher de s'effectuer naturellement. La plupart des maîtres suggèrent d'attendre six à huit secondes en kai pour réaliser un bon lâcher. Un lâcher trop prompt ne permet pas à toutes les composantes mentales et physiques du tir de se développer. Et un lâcher qui survient après un kai trop prolongé manque l'instant de sa maturité. Un vrai hanare est le résultat d'une fusion de l'esprit et du corps. Une fois introduit par l'esprit. il s'entrouvre à partir du centre de la poitrine, comme une poire ouverte d'un coup de couteau. Certains maîtres font fermer les yeux à leurs élèves alors qu'ils maintiennent une ficelle rendue entre leurs mains: le maître coupe ensuite la ficelle par son milieu pour faire sentir à l'élève ce qu'est un hanare correct. Lorsqu'on voit un bon hanare, on a l’impression de voir ce qui se passe quand quelqu'un frappe sur un grand tambour. L'action dure le temps d'un clin d’œil, mais la puissance du coup se fait sentir au-delà de cet instant. Un pauvre hanare, par contre, revient à regarder battre du tambour à la télévision, mais avec le son coupé.

fom the Bukyo Shagaku Sheiso [20]

But take someone who just belts off one arrow after the other: he's not learning technique, he's learning errors! Give him around a month and his errors will be completely ingrained. The further he goes, the further he gets from the correct technique. A day's worth of mistakes turns into a lifetime's worth of folly. Can you afford to forget that?

If you take someone whose whole mind is devoted to learning (and there are some who wish to learn but don't devote their whole mind to it: they just fixate upon a 'perfect' model they have seen or some fine words they have heard and fail to examine the reality of what lies behind them: they just take it for granted that they are right. There is no progress to be had by mere mimicry of another), anyway, supposing this person is endowed with a natural aptitude, he must never take it for granted. He must constantly discipline his mind around the techniques of: (1) concentration, (2) full draw, (3) balance, (4) lightness at the release and (5) focus. On the road and at rest, awake and asleep he must indoctrinate his eyes and his brain.

For the first ten days or so, concentrate on keeping your bow-arm shoulder down until you are so used to it that you can do it without the slightest effort. That is 'shoulder practice'.

Examine your target with great care: as you raise your eyes, see that the centre point of the makiwara is not blocked by the grip of your bow. That is 'eye practice'.

Grasp the bow grip comfortably with all five fingers: forget all the nonsense about settling the grip in your palm or making a 'phoenix claw'. The key is in the upward tilt of the web of the thumb and forefinger. At full draw, the arrowhead must come back to the grip without any interference from your fingers. The grip must be settled comfortably into the palm of your hand. This is 'hand practice'.

The bow and draw-hand upper arms must be level: right through the pre-draw into the full draw, and once into the full draw the upper arms must be level and unwavering. This is 'arm practice'.

Ten days or so like this and you have built your house on good foundations. All these things are related only to drawing technique. But the crux of archery technique lies in a firm, full draw. That's why I call it 'a good foundation'. Once you have built up a firm foundation, shooting for distance and accuracy is relatively easy. Don't start to shoot at the makiwara unless your foundation is firm.

20 Gao Ying (Ko-ei, 1637), translation Stephen Selby.

This is the correct technique: start your pre-draw low and get your bow-arm shoulder right down and very firm from the start. Coming up from the low start, your bow hand needs to push forward while your draw arm shoulder and elbow simultaneously do the reverse, drawing backward and downward from a high position and then stopping. This is shooting technique.

When you release, the draw-hand palm must face forward, but you must never use the ‘snapping’ action. If you do, you will spoil the spontaneity of the shot and it will not be accurate. Keep the palm facing forward. At the moment of release the middle, ring and little fingers must all be tucked firmly into the palm. Don’t flick the hand open: just let the thumb and forefinger move apart and that will give a quick, crisp release.

You need to work on getting your concentration, full draw, balance, and lightness at the release very fluent, and make all the details come naturally. Once the draw-arm comes up, go into full draw; as soon as you are at full draw, bring you balance, lightness of release and focus into play. It’s like riding down a slope on a good horse: it has a natural feel for where to place its feet.

A hundred days like this and your shooting will be smooth and under your control and that is the only way to take full advantage of the makiwara and prepare yourself for the archery range to rehearse for the examinations. Everyone who practices on the makiwara displays a degradation of technique once they get out on the range. So when I talk of ‘rehearsing’ I mean getting your range technique in line with what you achieved at the makiwara, so that your stance and hand technique are all exactly the same as you achieve with the makiwara. That is the only correct way to practice without falling into the common mistake of belting out arrows one after the other.

This way of practicing with the makiwara is more than a hundred times more demanding than what most people do with it; but all that effort will reward you with greater skill and save you a lifetime of wasted effort. That’s why I say ‘without falling into the common mistake of belting out arrows one after the other.’ So many people nowadays don’t bother to study technique: as soon as they have a bow in their hands, off they rush to the archery range with hitting the target straight away the only thing on their minds. All their errors just get compounded, then how can they hit? That’s what I call ‘the faster you go, the longer it takes you get there.’

If your technique is deteriorating out on the range, then get back in with the makiwara and refresh it. Once you have refreshed it and nothing is going wrong, get back out to the range and try it out again. Keep at it and don’t get frustrated at the repetition. You have to work on making your hits result from a winning technique.

Once I was coaching someone in archery practice and I told him to just get his technique right and not be get impatient about hitting. He said, "Mr Gao, all

you ever want is to teach people style, you never want them to hit! What's the point? People like me need to hit, not get hung up on style!"
"Nonsense!", I said, "If you hit without a winning technique, then it's a matter of chance which is something which cannot be taught. If you can hit without good technique then you can keep up your run of luck with some practice over time; but then you have no basic technique you can maintain: stop for a while and the luck runs out and no more hits. Or you might get to the competition ground, miss a few and get panic and not be able to hit; or you might be in a life-threatening situation and lose courage and miss then, too. That's what is meant by 'lucky hits.'
When I talk of not seeking to hit but seeking a good technique , what I mean is that when your technique is developed, hits will flow from it. Even if you are not striving to hit, you will still do so. Such hits will not be a mere matter of luck.

the different kinds of shooting [21]

There are six kinds of shooting with the long-bow, namely, roving, hoyle-shooting, flight-shooting, butt-shooting, prick or target-shooting, and clout-shooting.

1. roving.

Roving, or shooting at rovers, appears to be the most ancient kind of shooting of any, and consists (as its title imports) of roving about and fixing on casual and unmeasured marks, at which to aim. These are generally selected at considerable distances, and shot at with longer and heavier arrows than those used for most other kinds of shooting. Roving has the advantage of target-shooting by carrying us over an extent of country, and thus enhancing the interest of the sport by continual change of scene. Hence, Dr. Mulcaster, speaking of the various kinds of archery practised in England, says, "Roving must needes be the best and most healthfule, both for varieties of motion in diversities of soil, and by using all archery in exercising one kind."
Other advantages of roving are, that as the distances are generally considerable, the archer is obliged to shoot at high elevations, frequently as high as forty-five degrees; he, consequently, draws more towards his breast, or the point of his shoulder, than in target-shooting, and hence learns to command a very strong bow, acquires a knowledge of distances, and becomes inured to more powerful exercise than most other kinds of archery can afford. In fact, when the distances are judiciously varied, shooting at rovers is an excellent mode of practising archery with a view to improvement.

2. hoyle-shooting.

Hoyle is an old North-country word, signifying a small eminence as a mole-hill, and the like; which, when of sufficient prominence, may be made a mark to shoot at. In this kind of shooting there is generally a leader, who fixes on the objects to be aimed at; and it is frequently practised after butt or target-shooting, on the road home, either for mere amusement, or to determine a game, when both sides have left off equal.
Strictly speaking, as the marks shot at in this sport are varied and uncertain, hoyle-shooting is nothing more than a kind of roving.

3. flight-shooting

Flight-shooting (so called from the flights, or light arrows, used in the game), is practised without regard either to mark or distance. To shoot the greatest possible length, is the grand object; and hence it affords opportunities of comparing the flight of different kinds of arrows in all weathers, as well as of

21 from The Archer's Guide by an Old Toxophilite: www.archerylibrary.com/books/guide/

trying the powers of bows.

4. butt-shooting.

Butts are composed of turfs of earth, and are in form nearly square, though somewhat resembling a wedge. Those turfs which are dug from a common, where the grass is short, with roots of heath-plants matted in it, are preferred to all others. These are laid upon each other, and pressed tightly together. The length of each butt in front is generally somewhat more than nine feet, the height seven feet, four feet deep at the base, and one foot four inches broad at the top.
These are placed at various distances, generally in sets, and so disposed that they do not stand in the way of the archer when shooting at any of the lengths. Upon them is placed the mark, (about breast-high,) which is a circular piece of thin white pasteboard, of about four inches in diameter.
Other butts, which are now more approved of, are made of straw, laid first in trusses, and then pressed down as tightly as possible, the ends being afterwards cut smooth. Butts of this description, being kept under cover, are very durable, and, from their never injuring the arrow, must be pronounced preferable to those made of earth.
The great advantage of butts is, that they save the trouble of carrying targets and their stands to the ground; nothing more being necessary in butt-shooting than the small pasteboard target, of which we have before spoken, which may be conveyed without any inconvenience to the place of exercise, and easily fixed on the butt. Earthen butts, or mounds, for archers to practise at, were formerly erected by statute in every parish in England. 33 Henry VIII. cap. 9.

5. prick or target shooting

Target-shooting we have explained at page 140. Prick-shooting appears to be merely a different mode of practicing the same thing. Prick is a Saxon word, signifying point, whence it may be inferred that this kind of shooting was chiefly confined to small marks. These were arranged at fixed spots, and at less distances than the ordinary target-shooting.
"The marks used in this kind of shooting," says Mr. Roberts, "have, for more than two centuries past, consisted of a small circular piece of white paper, (fixed to a post by means of a hole and wooden pin,) or of a target. The former is now always placed upon a butt; the latter occasionally occupies its place on the butt, (especially at public shootings,) though it is generally placed upon a frame, which gives it any degree of elevation required.

6. clout shooting.

The clout is now a small white target, generally made of pasteboard, and of about twelve inches in diameter. It is fastened to a sharp upright stick, which is driven into the ground in rather an oblique direction, till the lower edge of the

clout touches, or nearly touches, the round. Frequently several marks are so stuck about a field, at distances from a hundred to a hundred and fifty yards apart. The marks being small, it is usually understood at this game that every arrow counts that hits, or falls within two or three bow's lengths of the clout. As the incumbrance of carrying these small marks is but inconsiderable, this mode of shooting has its convenience to those who cannot have immediate access to a butt or target-ground; for it affords them the facility of practising in any neighbouring common or field.

stringing an asian bow

step-through method 1 [22]

This method if done correctly it is a quick and superb technique and everybody should be familiar with it. Yes, it is a little bit tricky and sometimes scary for those who are not used to it, but with a little practice and patience anybody can learn. Some of my bows actually require this method more then using the stringer because it is actually safer. This method is also used for stringing the horn composites.
Now, step through the bow and seat the part of the lower limb just where it reflexes into the static tip over your shin bone and above the ankle, far enough, so that when you flex the bow, the tip will not dig in to the ground damaging it, refer to picture n°1 and 2. Also, make sure the loop of the string is seated in the nock. To make sure that it is, you can put bow tip protector over it or simply wrap a rubber band around the tip and the string to prevent it from coming out of a nock. Hold the upper part of the string in your right hand by the loop outside of the bow maintaining a little bit of tension on it. The handle of the bow should be resting on the back of your thigh about half way up between the knee and your buttock. You should have a medium wide stance. Now the tough part comes, you have to flex the bow to be able to string it. Use your whole upper body and not just your arm in fact you should lock your arm with the elbow against the side of your body. Now twist forward and at the same time bring the string you have been holding in your right hand toward the tip of the bow, trying to meet both ends, the tip of the bow and the string loop. Make sure you keep the string slightly taught while you do that. Once the two ends meet just slip the loop of the string over the tip of the bow and in to the nock. Before you let entirely go look down at the lower limb making sure the string is firmly seated in the nock and on the limb, not off to the side. Only then release the tension and step out of the bow.

22 http://www.salukibow.com/faq/

step-through 2 [23]

Attach the bowstring to the top limb tip of your bow. With one hand hold the bowstring in place.	
Step through your bow and rest the lower limb over your thigh while holding the loose end of the string with your free hand.	
Pull the top limb forward while bending down toward the lower limb tip. Hold the limb firmly to prevent it from twisting from side to side.	
Place the lower end of the bowstring over the limb tip. Check both ends for proper string positioning and step back out through the bow.	

23 http://www.koreanbow.com/Manual.pdf

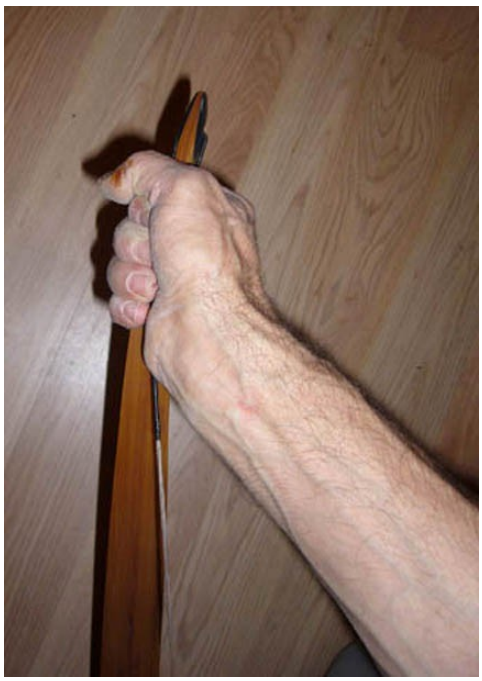
two men technique [24]

This method is by far the safest method of all, but it does require an assistance of another person. Sit on a chair. Put the bow across you knees. Make sure the parts of the limbs, just past the fade outs on the riser, are resting on your knees. With your hands hold the limbs just below the tips to have enough comfortable leverage. If you noticed, the lower part of the string is in the nock already, safely held by your hand in position, so that it does not come out of nock during stringing. The rest of the string is laying across your upper legs and held on the other side by your helper as illustrated. Now bend the limbs towards your body, make sure the helper does not try to help you by trying to pull on the string as you bend the bow. Simply have him wait until you bring the upper limb to him when you bend the bow across your knees. Then, he can safely bring the loop of the string over the tip and seat it in to the nock. To unstring, simply reverse the process. This method is suitable for stringing horn bows as well.

24 http://www.salukibow.com/faq/

aligning the limbs of horn and fiberglass bows after stringing [25]

Checking for proper alignment: look over the back of the bow at the tip. Make sure the tip is at a right angle to the flat plane of the limb. Follow the pictures to see how it is done, if you have a twist in the limb. Correct by twisting in the opposite direction and hold for a little bit. You may have to repeat this several times to achieve proper results. Make sure that during twisting, to correct the tip, you do not go too far and move the string of the limb, accidentally unstringing the bow. If the twist is severe, you may have to exaggerate the correction or even use heat. Such twists usually come from neglect or abuse of the equipment.



25 http://www.salukibow.com/faq/

aiming methods [26]

Instinctive:
The instinctive shooter focuses on the target and nothing else. Visually, all that is seen is the desired target. Logically we know that the peripheral vision picks up external cues, however, the mind for all intents and purposes does not see them. Without getting into a variety of definitions the conscious mind relegates these things to the subconscious and adjusting for windage and elevation are done without any direction from the conscious mind. That is essentially the main difference between instinctive shooting and any reference aiming method. A reference shooter will be able to tell you, at some level, where the aiming reference they use was held. An instinctive shooter will not.

Getting into the reference methods...
All these methods are based upon learning the point on distance of the bow setup. The point on distance is the point where the shooters line of sight and the trajectory of the arrow meet. This will vary from shooter to shooter. Things like arrow speed, arrow length, anchor point, hold on the string (split finger or three under) will all affect the point on distance. This isn't an all inclusive list of factors. Many reference shooters will tailor the point on distance to the style of shooting done. Many short distance shooters like hunters, 3D and indoor archers will setup for a closer point on. Shooters who enjoy shooting long distance generally set up with a longer point on distance to minimize hold over on far targets.

Split Vision:
This method is a step up from instinctive shooting in terms of consciously referencing an aiming point. For many shooters this it is based more on an acquired sight picture. There may not be any hard and fast gaps or references but they are aware of the arrow, riser, etc. These things are generally seen in the peripheral vision and things are lined up until the picture looks correct.

Various Gap methods...
Gap at target:
This method involves the shooter knowing the amount of trajectory the arrow has at various points until the point on distance. They will generally pick a spot above or below the target that coincides with the amount of trajectory the have to compensate for and place the arrow on that spot. For example, say a shooter needs to hold 12" below the target at 20 yards. They visualize that spot and place the arrow at what they perceive to be 12" below the target. The focus remains on the intended target but they are maintaining that gap in their peripheral vision. This method is very similar to pick a point.

Pick a Point:
The setup is virtually the same as gapping at the target. The main difference is

26 http://www.archerytalk.com/vb/showthread.php?t=1775877

where the focus lies. If a gap shooter maintains 90% focus on the target and 10% on the gap the opposite would be said of a pick a point shooter. 90% of the focus would be on holding on the pre-determined spot with 10% the actual target. In essence, the shooter is using the point to try hitting a certain spot but the trajectory carries it to the spot above or below.

Short Gap (or Gap at Bow):
This method is a little different from the gap at target method. It involves the shooter visualizing the target as being a spot that is directly in front of the arrow. Almost like a painting and the arrow is the brush. The point on distance is known. Above or below that the shooter would see the arrow (as a brush for my analogy) moving in very small amounts to compensate for trajectory. The archer moves the arrow in fractions of an inch at the bow. A picture is easier to explain but it involves seeing the target as a two-dimensional object. This can be difficult for some people because the brain sees in 3D and you have to see it as a picture and see the actual amount the arrow moves directly at the bow. This can be hard because while the arrow may only move a fraction of an inch at the bow the tip in relation to the target may move several inches or feet.

Gapping with the Shaft:
This one's fairly self explanatory. The shooter utilizes the shaft as a measuring device for how much to hold over/under. Through practice a shooter will know how many shaft diameters above or below they need to hold. The advantage to this method is it breaks down the adjustments into easy to see units and do not require as much visualization. The downside is as distances grow the shaft becomes larger in relation to the target and makes fine adjustment a little harder. At 20 yards the tip may only cover a portion of the target. At 60 yards the tip may cover the entire bail and one shaft diameter may move the visual reference several feet.

Gap at Riser:
This method utilizes various points on the riser as a rudimentary sighting reference. These references may be a side plate, a plunger, the arm of a rest, a lamination on the belly of the riser, the shelf of the bow or any point the shooter wants to use. A shooter estimates the yardage and at full draw will line up one of these references with the target. If the target is the correct distance and the correct reference is used the arrow will impact in the center of the intended target. This method may not be quite as precise as gapping at the target, short gapping or picking a point but it gives the shooter a concrete visual reference. You don't have to visualize arcs or trajectory, you simply line up the reference point and execute the shot.

Now, many of these methods may be used in conjunction with another. Perhaps you have a long point on distance. You may gap off the riser at shorter distances because the gaps at target are huge and you can't visualize a short gap. As the targets get further out you may transition to a short gap because you can see the difference between 1/4" and 1/2" or you gap at target. At

point on you simply utilize the point directly on the bullseye. And once past point on you may transition to pick a point. You know how far the arrow drops past point on so you visualize a spot above the target the appropriate amount and aim at that, trusting the arrow will drop into the target.

These methods blur together. While one method will work for one shooter another may not be able to visualize the correct hold. This picture illustrates the actual hold remains the same but a shooter may utilize any of the above references to break down the aiming method into one the mind can use simply and effectively. That, in essence, is all these methods are. They are a means of compensating for the trajectory arrow and allowing the shooter to control the process. Some shooters will excel with the instinctive method because they aren't good at concentrating on a reference and the target. People like this are better off allowing the subconscious mind to take care of the aiming and allowing the conscious to run the shot. Yet, for all the people that are good at instinctive there are just as many people who feel out of control without some type of referencing system. Without something to focus on they never develop confidence and never acquire the accuracy they desire. Shooters like this will do well to experiment with various aiming methods until they find one which suits there style.

the secret of instinctive shooting [27]

After 10 years of hunting with compounds, here I was, learning how to shoot a bow. The slender longbow felt feather light in my hand, yet mule stubborn as I strained back the string. And as I gazed through the void normally occupied by sight pins, I had not a clue how to guide the arrow into the vicinity of the target. "Just look hard at your target and shoot," the old longbow shooter had told me.

"But how do I aim?" I`d responded, trying to pry from him the mysterious secret of successful instinctive shooting. "Just look hard at your target and shoot." I pulled back, looked hard, and shot. The arrow glanced off the sidewalk 2 feet in front of the target, ricocheted off my garage door, and smashed into a block wall. "Just as I thought," I thought. Undaunted, I moved the target to a place where my archery education might prove less costly. I kept shooting. After a few weeks, I found I could hit the target quite consistently. It was interesting, and I kept shooting. Eventually I found I could hit the target almost at will, with only the occasional mental-lapse miss that kept it challenging. This was fascinating. But the most satisfying part was the productive hunting I enjoyed in the following years, taking whitetails, mule deer, antelope, bears and caribou with only a stick bow, some arrows and my instincts. It's a wondrous thing, this instinctive bow shooting. I'd like to share with you what I've learned.

The first step is to understand that the term "instinctive shooting" is a misnomer. We have the capacity to shoot a bow quite accurately without the aid of devices, but it does not come from instinct. It is achieved through highly trained hand/eye coordination and concentration learned from hours of practicing the mechanics of good form.

Some people can't believe this method of shooting a bow is practical, or even feasible. "Instinctive shooting can never be as precise as shooting with sights, so a bowhunter who shoots that way is always at a disadvantage," they say. But they're wrong. We're talking bowhunting, not an archery tournament. A bowhunter is not required to hit a spot the size of a quarter to be successful. He needs to hit something the size of a dinner plate—the vital zone of an animal. Precision beyond that is purely academic. At normal bowhunting ranges of 0 to 25 yards, a well practiced traditional shooter should be able to kill deer just as consistently as an average archer with all the gadgets. And in cases where he must shoot very quickly the target is moving, the shooting position is difficult, the weather is horrendous or shooting light is minimal —all quite common conditions in bowhunting—he should be able to do it better. And of course, he will never miss due to a loose sight pin, a faulty launcher, a jammed release, or plugged peep-all of which, by the way, have cost me animals. Beyond that, there are instinctive shooters who are so accurate they can pick off rabbits, squirrels, even flying gamebirds consistently Mastering the aft of instinctive shooting to that degree requires mental concentration and

27 Mike Strandlund
http://guide.sportsmansguide.com/adventures/instinctive-bow-shooting-part-2/

well»practiced fundamentals of shooting form. But mostly it takes being connected to that mysterious energy that allows you to just think about hitting a target with an arrow, and then making it happen. It's that last part that baffles most people. How, exactly, do you achieve that "instinctive" accuracy? The way instinctive shooting always seems to be described is picking a spot, concentrating on it, and releasing. I have never found that description sufficient to do my shooting any good. I groped, experimented and struggled with bare bow shooting.

But l think I've found, and can describe, the secret. Yes, it does involve concentrating on a spot, but it is much more than that. lt is not just looking at a spot, but looking at it in a way that your eyesight is, in a way, projected into it. In preparing to shoot, imagine your eyesight as the sun's rays through a magnifying glass—that you could burn a hole in the target if your sight is focused and intense enough.

There is a second part to this equation, which is that you must project with your entire body. You feel (don't peek!) how your arrow is pointed, and put everything into a straight line by drawing with your back muscles, not your arms. You bum a tiny hole in the precise spot you want to hit, while being subliminally conscious of how your muscles are directing the arrow, with it all connected and working in synch. That is the simple secret. There are several ways to screw this up. It is quite possible to look at the spot you want to hit without doing it in a way that promotes accuracy—without really focusing on it. Again, you have to project your sight feels confusing and you become conscious there is little likelihood of making the shot.

Do not even dream of consciously looking at your arrow, bow hand, or the gap between your arrow tip and the target. To do that is to destroy the process, and if you do hit the target after peeking at how your arrow is pointed, it will be largely by accident. What all this amounts to—and why it works—isn't really magic. It's focus. It just feels like magic.

Of course, no degree of perfection in "aiming" is going to help unless you have a good release and follow-through. It really doesn't matter what you do, as long as you do it consistently. We just use an "on»target" draw, a solid anchor point, back tension, finger~slip release, and keeping the bow in place during follow through for the simple and effective reason that all these things are much easier to do consistently than their alternatives. Beyond that, the instinctive release and follow~through should be an extension of "pointing with your muscles." It should be almost unconcious, with no last moment movement of either hand not even a blink. When you get the technique down, it is truly amazing. In certain cases it is more accurate for howhunting than mechanical sighting devices. When you're in the groove, you just can't miss. You can feel that acutely and it feels great.

Describing the perfect instinctive bow shot and how to achieve it is probably the most difficult concept I've ever tried to put on paper. I'd like to go further and describe it as a flow of energy from the eyes to the target back to the hands, a circuit of something like electricity that, provided your form is right, will send an arrow as true as a laser beam. I'd like to say it comes from the heart, or the soul, or maybe our genes that still carry DNA from the hundreds

of generations of our ancestors who depended on bows and arrows every day to stay alive. Something spiritual wells up through your hands, arms, brain and eyes, and when everything is right, there's a spark in the mind that knows with ultimate certainty, the instant of your release, that the arrow will slam into the center of whatever it is in your "sights."

Sometimes you know it before you even draw the bow, which is one of the highest highs in bowhunting. But people who have yet to discover and understand the beauty of true instinctive shooting might scoff at all this as some kind of quasi Zen weirdness. So I just tell them to look hard at your target and shoot.

preventing shoulder injuries [28]

Shooting a bow is a tough job for your shoulders. Your string shoulder is pulling and rotating your shoulder outward while your bow shoulder is pushing and resisting collapse inward. These are obviously opposite activities and subject each shoulder to different types of stress and injuries. In my experience most bowhunters have shoulder problems with their string or "pulling shoulder". This makes sense when you consider that the rotator cuff muscles are the major "pullers". These muscles are pretty small and are easily strained or torn if not properly conditioned. These muscles also get weaker and more susceptible to injury as we age. In fact, the vast majority of rotator cuff injuries occur in people over 40.

Drawing a bow puts tremendous strain on these muscles. If you start slowly and gradually increase your shooting, then the muscles will become conditioned and you should have few problems. If your shoulder starts to hurt then cut your practice back slightly and drop your bow weight if possible. Usually mild pain that only occurs with activity but still allows you to shoot is caused by inflammation of the muscles and tendons. The pain is caused by tiny tears in the muscle or tendon with microscopic bleeding and a subsequent inflammatory response. If you ignore the pain the tiny tears can become more serious and eventually lead to a complete disruption of the muscle or tendon. This can happen gradually or from a sudden injury such as a fall with your arm overhead. At this stage you will no longer be able to perform the motion, not because of pain, but because the muscular attachment is disrupted. Another possible source of shoulder pain is the various bursae which cushion and protect the joint. Bursa are small fluid filled "pillows" which are located between bones in your shoulder to provide cushioning and to keep the bones from rubbing together. These bursa can also become inflamed from overuse or poor form and lead to bursitis. This is an inflammatory process which should respond well to rest and anti-inflammatory medications.

A shoulder strengthening and conditioning program is a great way to prevent many chronic shoulder problems as well as rehabilitate previously injured bowhunters. As noted above, gradually increasing your bow practice and starting with a lower draw weight will get you off to a good start.
A very simple way to even out the development of your shoulders is to start and finish every practice session by switching arms and drawing your bow with your opposite hand. Hold at full draw for five seconds and let down.
Shoulder stretches should be a part of every archer's warm up routine. It is even more important for those of you over 40. These stretches help keep the muscles flexible and limber. They will improve blood flow to the muscles which can help resolve inflammation. They are a great way to rehabilitate a shoulder which already hurts and an even better way to prevent injury.

28 http://bowsite.com/bowsite/features/bowdoc/shoulder/

The first stretch works on the front part of your rotator cuff which is the subscapularis muscle. Hold your arms at 90 degrees from your body and flex your elbows to 90 degrees. Now gently try to touch your shoulder blades together. You should feel a stretch in the muscles of the front of your shoulder. Now straighten out your elbows and repeat the stretch. You should hold each position for five seconds and then release. Repeat five times and then move onto the second stretch.	
This stretch targets the all important posterior muscles of the rotator cuff which are the bowstring pullers and are the most commonly injured. Place your right arm across your chest and rest your hand on your left shoulder. Place your left hand on your right elbow and gently push the elbow toward your chest. Hold this position for 20 seconds then relax. Repeat this stretch five times and then switch arms.	
The final stretch is for the supraspinatus muscle which is the top muscle in the rotator cuff and helps you bring your arm overhead. Put your right hand behind your back and grab your right wrist with your left hand. Pull your right wrist to the left. Gently pull for 20 seconds then relax. Repeat five times then switch arms. You should feel the stretch on the top of your shoulder.	

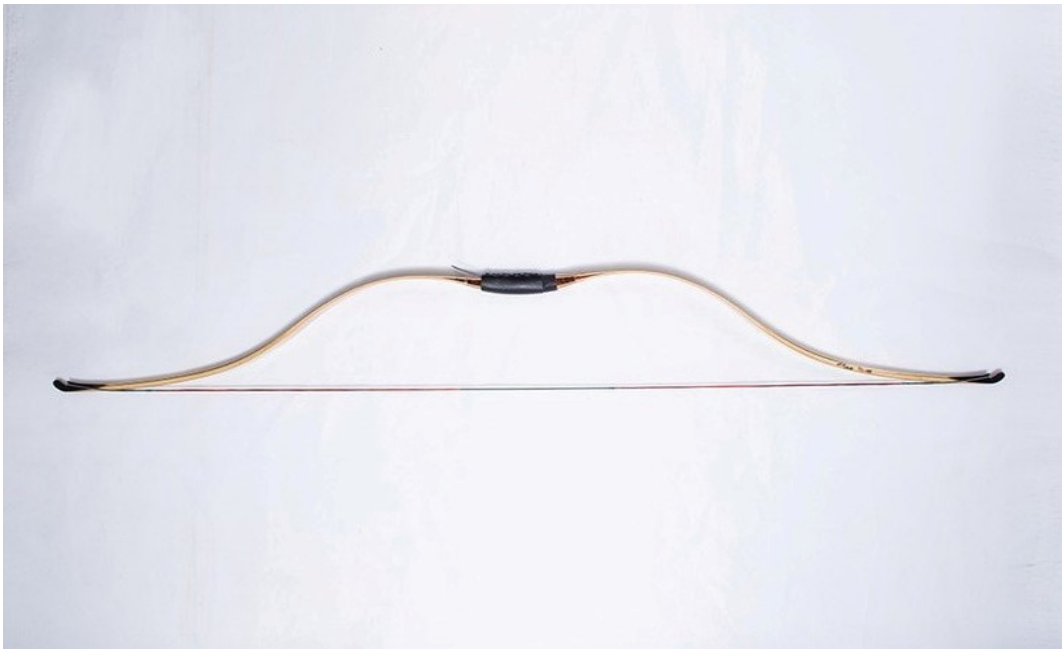
asian bows

One can find nowadays many kinds of asian bows: turkish, hungarian, chinese han, chinese tang, chinese ming, manchu, korean, mongolian, etc. The aim of this chapter is not to delve into the technical details of bowmaking, whether traditional (composite of horn, sinew and wood) or modern (composite of wood and glass or carbon fiber). It is to understand some of their main differences in order to help archers make their choice.

One thing most of these bows share is their stiff tips called "siyah" (Arabic, Persian, the most common name used today, sometimes translated as "ear"), "szarv" (Hungarian), kasan (Turkish). A siyah is said to be *passive* because it does not act as a spring to store energy, it acts as a lever to help bend the active part of the limb. They are meant to increase early draw weight and flatten the draw length / draw weight curve (see p56). Thereby the bow is made more efficient, meaning it stores and gives back to the arrow more energy for a given draw weight than a bow without siyahs.
The main difference between the various asian bows designs lies in the length and angle of the siyahs. Of course other factors impact the performance of the bow: length of the active part of the limbs, their curvature, etc. But the siyahs are an easy way to classify asian bows. Some examples with modern materials:

chinese tang [29]

29 www.alibowshop.com



« Long siya short limb for stability, yet the prominent recurve shape still let it have a good arrow speed. »

chinese ming [30]

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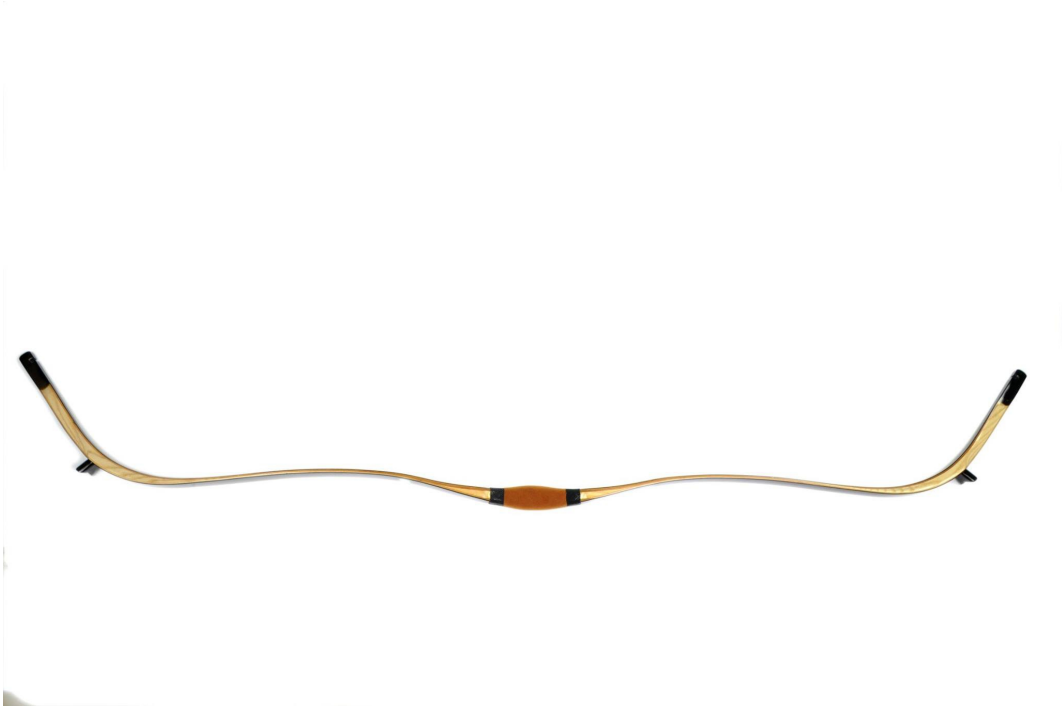
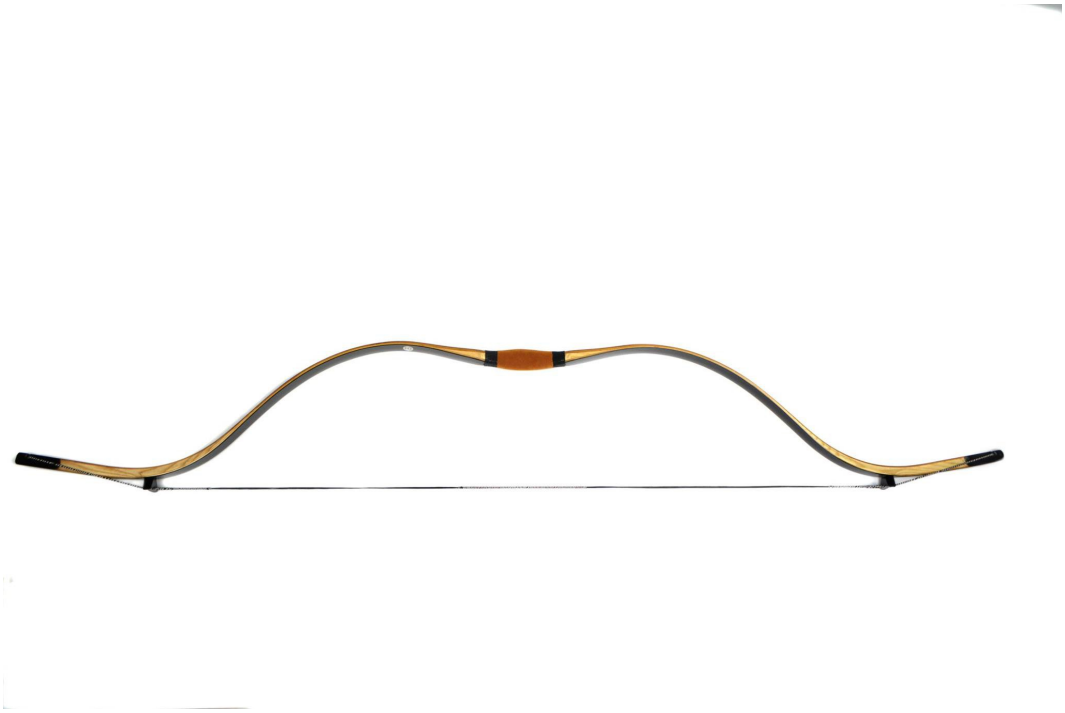
As compared to the tang bow, its siyahs are shorter and more angled. Another major difference is that the string is in contact with the siyah, whereas on the tang and other designs, it goes straight from nock to nock. As a result this bow is more difficult to string and more prone to limb misalignment. That’s why the string stays on a small bridge like this one:

The string also gets a little extra "pop" when it snaps against the bridge after release, giving the arrow a bit more velocity and power. All in all this gives very fast bows.
Korean bows feature quite the same characteristics.

manchu design [31]





Its long and very angled siyahs exert strong leverage, allowing to shoot very powerful bows (around 100 pounds was common in the army, with a record in a contest of 240 pounds) with long (36" draw length) and heavy arrows able to pierce armors.
The main difference between the Manchu bow and its predecessors is the more forward angle of the rigid ear and the presence of a very prominent string bridge. This makes for a flatter force-draw curve, and more stored energy for a given poundage. Disadvantages of the design are that any bow with more

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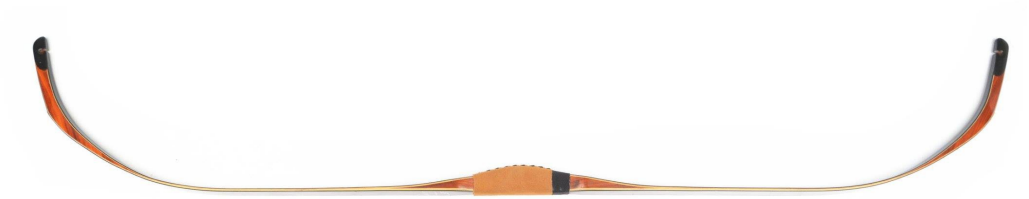
forward pointing ears is also more susceptible to twist, requiring more attention and skill in maintenance. Heavy bows of this type store a lot more energy than static non-contact eared bows or contact bows with less recurve, which are the same draw weight. But they are also harder to string and require more care.

turkish bow [32]



« Used in the Ottoman Empire, it is one of the shortest bow in history. The short limbs give it superior power when shooting lighter arrows over long distance. »

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videos

A picture being worth a thousand words, some excellent videos can be found on the web:

– Stephen Selby, founder of ATARN (Asian Traditional Archery Research Network, www.atarn.org/), posted on youtube: ATARN presents Chinese Archery part 1 to 4

– Armin Hirmer, founder of malta archery (www.malta-archery.com) posted on youtube many videos, in particular: thumb release, stance, and khatras. Also of interest some bow reviews and thumbring reviews.