

Archery Handbook



Fair Play Philosophy

- help your athletes develop a positive self image
- promote respect for the rules, officials and their decisions
- promote respect for your opponents - respect his/her space on the line or in the shooting lane; keep quiet so the other archer can focus on the job of shooting
- load your bow in a vertical position so you do not interfere with other archers on the line; also, when at full draw, be careful not to interfere with the other archer
- when leaving the line after shooting the end, do not leave when the adjoining archer is at full draw
- encourage a constructive attitude toward competition
- develop a sense of dignity under all circumstances
- provide an equal opportunity for all to learn skills
- encourage participants to continue participation in sport
- don't touch another archer's equipment without permission

Introduction

The novice who reads this booklet will be guided in acquiring equipment suited to his purpose. By the study of the shooting techniques contained herein, he can, through strict self-discipline, acquire good shooting form. Whether on the target range, the field course or in the hunting field, the ability to shoot well enhances the sport of archery and increases the recreational possibilities for every member of the family.

- signal to collect arrows with three blasts. A series of short blasts is to signal danger and all shooting must cease.
3. Don't draw a bow without an arrow. Only draw a bow when on the shooting line with the arrow pointed to the target. Releasing the string without an arrow will likely cause damage to the bow limb.
 4. Indiscriminate shooting, such as at objects other than the target or high in the air is dangerous and thus not allowed.
 5. Never aim a bow at anyone.
 6. Don't handle other archer's equipment without permission.
 7. Spectators are to be kept well back of the shooting line.
 8. Keep chatter to a minimum while other archers are on the line.
 9. Keep your equipment in good repair.
 10. Be a good sportsman. Courtesy shown to your fellow archer will earn the same in return.

ARCHERY BASIC HANDBOOK

History

The history of archery dates back to earliest times when the crude bow and flint arrowhead provided our ancestors with their food. During the Middle Ages, the bow was supreme on the battle fields of Europe. In our present society, archery is the sport and relaxation for thousands throughout the world.

The urge to shoot bows and arrows is latent in all of us. Every nation used the bow and arrow and, as time progressed, developed their own individual type of tackle. Early Saxon and Norman Archery perfected the famous, English long bow and the cloth yard arrow. Germany, France, Spain and Italy seemed temperamentally unsuited to long bow archery and developed the crossbow.

With their composite bows, the Orientals reached perfection in the bowyer's art. Shredded sinew in specialized glue formed the backs; a very thin strip of wood separated the back from the horn belly.

The Turks, who produced the most beautiful weapons, left the polished horn belly exposed, while the Persians and the men of India covered the whole bow with rawhide, birch bark or thin layers of shark skin. The bows of the American Indian were all shapes and sizes. They were usually quite crude but nevertheless effective. The Indian was a hunter rather than a long distance archer. His knowledge of woodcraft and his ability to stalk game made up for what his weapon lacked in range.

5. Arrows not matched to bow

B. Arrow slapping bow

1. Bow arm wrist too far inside the bow
2. Arrows not matched to bow
3. Tension in the bow hand
4. Brace height too low

C. Excessive bow noise

1. Brace height incorrect
2. Arrows not matched to bow
3. Compound not properly adjusted causing parts to touch on release
4. Loose parts (including arrows)

D. Arrow falling away from bow on draw

1. Pinching arrow between fingers
2. Not drawing straight back
3. Hook of fingers not deep enough
4. Failure to let the string roll towards end of fingers on draw
5. Back of string hand not straight
6. Tension in the string hand and knuckles

Safety - The bow was originally designed as a very efficient instrument for hunting and war. Although the target arrow is not as lethal, archery still has the capability of being a very dangerous sport and safety should never be taken for granted. Safety is of prime importance both for the hunter and the target archery.

1. Bows should only be drawn on the shooting line when it is safe to shoot.
2. On the target range, all shooting is under the control of a target captain, who will signal the start of the shooting with one blast and a

The Fundamentals of Archery

Keeping Fit - Archery is not recognized as being a physical sport but with a little analyzing, the exercise value of energy expended come to light. The shooting of a single FITA round requires 150 shots. Let's say the bow used is forty pounds. It will take 150 X 40 - 2000 pounds or 1 ton plus a minimum walk of 3840 meters just to the target and back.

Equipment - Today's bows are usually either recurve or compound design. The most used manufacturing process is the composite which consists of a layer of fiberglass on each side of wooden strips. The bow is strengthened near the grip to allow part of the handle to be cut so that the arrow can be shot from inside or on the center line. The long bow and pre-takedown era bows had to be shot outside center. The long bow is still used today by the traditionalists of the sport, but mainly in a simulated hunting environment.

Various refinements and aids are added as desired; these include sights, stabilizers, release aids, etc., however none of these accessories are required to learn the basics of archery. Most recurve bows of today are of the 'take down' type, which aids in convenience of traveling and limb replacement. Most modern compounds also 'take down' quite easily. Many different makes are available at your local archery shop as is much needed advice on any questions you may have.

Compound VS Recurve - While the compound and recurve are very different looking bows, the fundamentals of shooting them or any other bow, are exactly the same. The basic steps of archery are

Nocks must be put on the arrow absolutely straight and be the proper size for your string. Straightening arrows is a job that is often performed by the experts but the skill can be mastered with patience and practice.

Arrow Rests - In recent years the arrow rest has proven to be a favorite with the archery inventor. There are literally thousands on the market. For the beginner's bow, it is important to check that the rest is sturdy enough to hold the arrow from the same point every time.

Bow Sights - The addition of a sight should be checked for correct alignment. The vertical sight bar should be parallel to the string. Assistance should be sought out from your local pro shop or club instructor, if adjustments are difficult.

Correction of Basic Faults - After the initial form has been learned, it is not always possible for an experienced coach to be present when problems occur. It is important to be able to do a least basic self diagnosis. The ten basic steps form the very basics of the sport. Seldom are faults diagnosed one at a time, but usually manifest themselves in groups. One should work on the major fault first.

The following list will help determine where to look when certain problems are noted:

- A. Erratic arrow flight in the air
 - 1. Obstruction to the string, clothing, etc.
 - 2. Poor release, which could also cause the string to slap the arm guard
 - 3. Arrow nock too tight
 - 4. Bow arm wrist too far inside the bow

Exact sizes are determined by charts provided by the manufacturer. It is best to seek out professional advice in arrow purchase. Just to be sure, take your club coach with you when you purchase arrows. Spine is the measurement of the amount of bend caused by a two pound weight suspended from the arrow's center, calibrated in thousandth of an inch. Generally, there are four types of arrow material: wood, fiberglass, aluminum and carbon graphite.

Wooden arrows are not as popular today because it is difficult to find a matching set and they are not as durable as the new manufactured materials. They are still widely used by the traditional or long bow archer.

Fiberglass is good for a beginner class because of its durability.

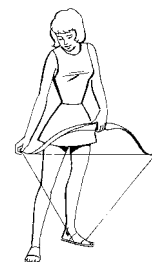
Aluminum makes an excellent arrow that is both consistent and durable. These arrows are also easy to straighten when bent. They are sized by a 4 digit code such as 1816. The first two digits denote the shaft diameter in 64th of an inch. The second two digits denotes the shaft width in thousands of an inch. Therefore, an 1816 is 18/64th of an inch in diameter and 16/1000th of an inch in wall thickness.

A popular choice amongst the top tournament archer is the carbon graphite arrows. These arrows allow for greater speed due to their stiffness, small diameter and light mass weight.

Arrow Maintenance - Arrows should be kept clean and checked for straightness regularly. Fletches must be attached uniformly and must not come in contact with the bow when the arrow is shot.

the same on the world tournament line as they are in the bush in a hunting scenario. Good basics, learned early in one's archery career, will provide an excellent foundation for years of future enjoyment.

Stringing the Recurve Bow - The only method of stringing a bow that is entirely safe is using the stringer. For the purposes of this manual, the most recommended, safest, easiest and best for the equipment is the stringer method. The step through method, if not performed absolutely correctly will cause permanent limb twist. The push-pull method is very dangerous for both personal and equipment safety and is not recommended.



Bow Stringer Method - Place the bowstring on the bow with the larger loop over the upper limb; then place the smaller loop over the lower limb tip, ensuring the loop fills both grooves (a small elastic band may be used to hold this loop in place). Place the larger pouch over the lower limb tip and string loop. Next place the smaller pouch over the upper limb tip; now stand on the cord of the stringer with feet about 12" apart, grasp the bow at the handle with one hand and pull. As the limbs bend, push the upper string loop into place on the upper limb tip. Once it is in place, slowly lower the bow, watching to ensure the string is properly seated in both limb tips. After removing the stringer check the limb tips again.

The stringer's cord length may have to be adjusted to accommodate shorter archers, or open the distance between the feet on the cord.

Stringing the Compound Bow - Bow stringers are also available for the compound bow, but such adjustments should only be carried out by experienced personnel. Serious equipment damage or personal injury can result by improper adjusting. Consult the bow's owners manual or take it to your local pro shop.

Basic Instruction - At the outset, it should be mentioned that during the first lessons, bow weight is most important.

Basic form must be learned at the earliest to give a firm form foundation. Therefore, the archer should be able to concentrate on form and not be struggling with bow weight. A very light bow is needed during the first lessons; as a rule of thumb, 20 pounds is recommended.

Archery is not a test of strength, although physical fitness plays a very important part when a competitor reaches the level of National and International competitions. Archery is a test of skill, and requires instruction and practice to attain any level of proficiency. There is no magic formula that will produce high scores, no short cut that will eliminate the need for personal effort. In archery you compete against yourself and high scores are in direct relationship to the intelligent effort and practice put forth by the individual. Generally, archery is not much of a spectator sport. Satisfaction comes from the skill developed by the individual hitting the mark. The beginning archer should be encouraged to practice as much as possible at close distances, not to move back more than 15 or 20 meters. During the first few lessons, basic form is to be learned. Testing accuracy too early can lead to a discouraged pupil.

Arrows - By far the most important piece of the archer's equipment is the arrows. Arrows must be matched to the bow. Amazing scores can be shot with a third rate bow with matched arrows. Initially, it is a good idea to have arrows that are slightly longer than necessary. Safety is more important with the beginner archer than fine tuning of arrows.

Arrow Length - For recurve style archers, the length of the arrows should be approximately the distance between the chin and the tips of the fingers. Instinctive archers may need to add about one inch due to the side anchor. Beginning archers may also be advised to add an additional 1/2" to allow for stretching out that may occur in future lessons. It is far better to cut long twice than short once.

The most recommended method of measuring draw length for a beginner is to use a piece of doweling calibrated in inches with a nock attached. Have the archer draw a very light bow several times. Then ask him or her to come to full draw with eyes closed. Observe the length, repeating the process several times. The average is the draw length. This process is used for beginners and to check the exact draw of very experienced archers. The actual point is not included in the length measurement.

Hunting arrows must be from 1/2 to 3/4" longer for broadhead clearance.

Arrow Selection - Arrows are sold according to bow weight and arrow length. The heavier the bow, the stiffer the arrow. For the same size arrow, the shorter is stiffer and the longer is more limber.

pinch that happens with a similar recurve bow.

Bow Storage - Recurve bows should be unstrung after each session. This is not necessary with compounds. All bows should be stored in padded cases between sessions. Bows can also be stored horizontally on wooden pegs on the wall.

Strings - Check the limb tips and nocks at both ends for sharp corners or uneven surfaces, which might cause undue string wear. Worn strings should be replaced before breakage occurs; servings should be kept in good condition. Occasionally the string can be lightly waxed and rubbed with a piece of leather. Twists in a string should be few and should be kept in the same direction as used in the single strands which make up the unit. Strings usually break in the loops or at the nocking point. If you break a string, check that part of the bow for rough or sharp edges. A break at the nocking point usually means a too tight or too sharp nock set.

String Material - Dacron strings have a very long life because they stretch slightly on release. This elastic quality allows them to be used for many thousands of shots. This quality is not inherent in Kevlar or Fast Flight strings. These strings do not stretch at all on release. Kevlar strings usually break in under two thousand shots. Fast Flight strings have a much longer life, possibly surpassing the life expectancy of Dacron. Because of this lack of stretch, more speed is attained, but there is a sacrifice of limb life in some bows. Fast Flight is also very hard on some compound limbs and cables. Always check your manufacturer's warranty before using Fast Flight. If in doubt, consult a bowyer or a coach.

However, there are certain basic steps which, when followed, make it easier for the archer to do the same thing every time and to develop rhythm. These steps have not changed a great deal since the days when Roger Ascham wrote "Toxophilus" or the "Art of Shooting the Bow" in 1545 during the reign of Henry VIII.

Eye Dominance - It is well worth the extra time to ensure proper eye/hand dominance before starting. It is most difficult to change later. There are very few cases where someone cannot shoot with their dominant eye. Where these special circumstances occur, it is best to try to start with the dominant eye.

Straighten your arms, cross your thumbs with palms open and away from you. Make a small hole between your thumbs and index fingers. Have someone stand about 10 to 15 meters away and look at his forehead through the hole. The eye he or she sees is the dominant eye.

Another method is to look at an object across the room and while concentrating on it, pull your hands back toward your eyes; the hole will end up over your dominant eye.

Basic Steps - These steps in shooting are the most important part of archery, and they must be concentrated on at all times. The beginning archer must become familiar with these steps, for all archers must come back to review them often.

When referring to the various steps in shooting form, we will deal with the right handed shooter. Items are reversed for the left hander.

1. Stance
2. Nocking the arrow
3. Bow hand
4. String hand
5. Draw
6. Anchor
7. Hold and Aim
8. Release
9. Follow-through
10. Relax

Stance - Take a position on the shooting line with your left side to the target. The feet should be spread comfortably apart, weight distributed evenly on both feet. Toes are touching an imaginary line to the target. Knees are relaxed, not locked backwards. The shoulders should line up with an imaginary line drawn from the center of the target to the archer. This is the regular stance. The opposite is true for left handers.

Another common stance is the oblique method. This stance allows for better chest clearance. The archer stands with the toe of the left foot about ten inches to the left of the line to the target. The body is pivoted at the waist until the shoulders are lined up at right angles with the target.

The important point concerning stance is that the feet should be in the same position for each arrow. Look along the left shoulder at the target. Always stand erect, with the body centered over the feet.

Nocking the Arrow - Hold the bow vertically; draw an arrow from the quiver and place it on the arrow rest, holding it near the fletches with the thumb and forefinger of your right hand.

adjustable and the only accurate way to ascertain peak and hold weight is to actually weigh them on a bow scale. Compound bows should never be adjusted above the weight range recommended by the manufacturer, doing so will most certainly void any warranty.

Bow Weight (recurve bow) - Recurve bows are also marked on the lower limb with the bow weight. This weight is measured at an industry standard. This is usually also marked and will say either 26 1/4 (or AMO) or 28 inches. 26 1/4" is the standard measurement to the bow rest and 28" is the standard measurement to the face of the bow. In most cases, these two measurements may be treated as the same. By using correct draw length we can accurately estimate actual bow weight. Most bows increase at a rate of approximately 2 pounds per inch near 28". So if we take the marked weight and add or subtract 2# for every inch over or under 28" we will have our 'actual recurve bow weight". Some of the more modern competition recurve bows are adjustable for weight over a range of 4 to 5 pounds. While the above methods allow for a fairly accurate estimation, the only way to ascertain exact weight is to weigh the bow at the archer's draw length.

Bow Length - A bow should be selected according to the physique of the archer. A longer bow is more comfortable with target archery, while a short bow is more practical when bowhunting. The most common recurve lengths are 64, 66, 68 and 70 inches. A 70" bow is usually used by a man about 6 feet tall, while the shorter or longer bows allow archers of different stature to take advantage of the full use of the recurve limb. In compound bows, the eccentric wheel allows for a much shorter bow to be used without the degree of finger

After a tournament, returning from hunting or just a practice session, check the bow over from top to bottom. Cracks or dents should be protected at all times with a good quality paste wax or car wax.

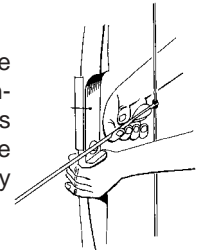
When you first get a bow, a few minutes spent making some critical measurements will save much time during future fault finding. Write these measurements down and store them with the bow for instant referral. The string height or brace height (distance from the arrow rest to the string) is very critical in some bows. This should be checked each time the bow is strung and before each shooting session. Variations of string height at the upper and lower limbs, where the limb core fades into the limb, should also be checked; in most bows this is 1/8 to 3/16 inch greater at the top than the bottom. In many compounds, this measurement is near equal. The string's nocking point measurement should also be checked frequently. This measurement is usually about 1/4 inch above 90 degrees from the rest. Refer to an owner's manual or a coaching manual for diagrams on equipment.

All modern bows, compounds and recurves, are subject to limb twist. On a recurve a twist is noticeable if the string does not cut the center of both limbs and the handle section when strung. A twisted limb on a compound shows up when the eccentric wheels tip to one side as the bow is drawn. Limb twist in a compound bow is a by-product of the transfer of the bow's weight from one side of the eccentric to the other during the draw.

Bow Weight (compound bow) - Most compound bows are marked on the lower limb with the draw weight and the peak weight range. Compound bows are

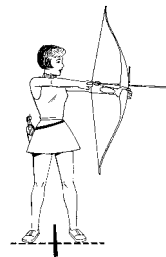
Lay the arrow on the arrow rest and revolve the arrow until the cock feather is perpendicular to the string and bow. Move the arrow back until the bow string is secured to the arrow's nock saddle. The arrow is no longer held by the fingers, but stays due to the nock's snug fit on the string.

It is important to learn not to hold the arrow on the rest with the index finger of the bow hand; this practice is dangerous and with the proper size of nock, it should not be necessary to keep the arrow in place.



Bow Hand and Bow Arm - The hand which holds the bow is called the bow hand. When an arrow is released the bow should have complete freedom of movement. An archer should not grip the bow but rather the bow should be held against the base of the thumb by the tension of the string. Most archers use a bow sling to prevent the bow from falling out of the hand upon release.

The bow arm is simply extended and held out without locking the elbow; it should not be stretched out and locked. For better string clearance the elbow can be rotated down and back. It takes some practice, but it is a skill worth learning early.

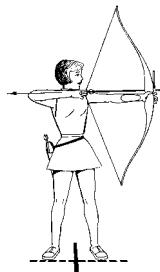


Drawing Hand - The string is drawn with the first three fingers of the string or drawing hand; one finger is above the arrow and two below. The thumb is relaxed in the palm of the hand.

The string cuts across the fingers of the drawing hand at about the first joint. While all three fingers should work almost the same in drawing the string, the middle finger will do slightly more work than the other two. Care should be taken to see that the back of the hand, the wrist and the third section of the fingers are in a straight line. The analogy of carrying a bucket of water is often used here. Bow arm is extended at shoulder level; elbow joint is turned downward away from path of bow string; shoulders are level. Pressure of the bow is centered in the 'Y' formed by thumb and index finger of bow hand.

Drawing the Bow (Barebow style) - The object is to get the bow hand stretched out toward the target and the string hand anchored at the side of the jaw or cheek. This 'high anchor' enables the archer to position his aiming eye directly over the arrow so that the line of sight and the line of flight are similar.

Extend the bow hand toward the target; at the same time swing the bow almost to a vertical position. The upper limb may be tilted slightly to the right to assist in bringing eye immediately over the arrow. Leave the bow arm slightly bent to permit the elbow to turn down and back. This leaves a clearance for the bow string, which might otherwise strike the inner side of the arm. Now, with the drawing hand, pull steadily back using the back muscles. Keep the elbow of the drawing hand high and parallel with the arrow until the forefinger of the drawing hand touches the right corner of the mouth. This is the position of anchor for the barebow archer.



some idea of what purpose they intend to use the equipment for. Bow hunting, target shooting, field shooting, recurve and compound are a number of examples of shooting styles. The novice should consult with an expert coach before purchasing equipment. This extra information cannot do anything but good. For the purposes of this manual, we will concern ourselves with equipment for the new archer who has just begun the sport.

Some of the muscles used to draw a bow are ones which are seldom used for other sports and are often under developed. Care must be taken to ensure the first bow is light enough so that the archer can concentrate on basic form rather than struggling to draw the bow. Therefore the bow used to teach a beginner must be light enough that the beginner can draw it the proper length without undue effort.

After the archer learns the proper form and has developed the muscles needed in the sport, he can then graduate to a bow that is the proper weight for the job or application required.

Most clubs have beginner equipment which can be used for the first lessons, but the first purchase should be a bow of lighter weight in the order of 25 pounds at 28 inches for juniors and women and about 30 pounds for men.

Bows - A modern bow is an intricate piece of machinery and needs maintenance and care to keep it in top form.

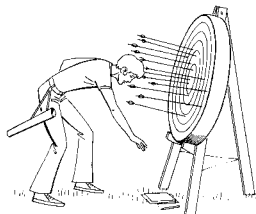
Bows should be checked often for twists, flaws or dents, and if anything is noticed, steps should be taken to rectify damage immediately.

Each arrow must be shot as a complete sequence of events. Nothing from the previous shot should be carried over to the next shot. Therefore, after each shot, relax completely and take several deep breaths before commencing the next sequence.

Pulling out the Arrows - Arrows improperly drawn from the target may cause damage to the arrow or cause personal injury.

Always ensure all arrows are scored before touching them or any part of the buttress, while arrows that were touched can still be scored, it is not possible to score arrows already drawn.

When drawing arrows from the buttress, first ensure no one is directly behind you in case the arrow is withdrawn too quickly and the arrow jabs back. Place one palm against the target so that the arrow to be drawn is between the thumb and index finger. Grasp the arrow as close to the target with the other hand, pull straight back until the arrow is moved. Arrows should be removed one at a time, and each arrow should be placed in the quiver after it is drawn.



Selection of Equipment - Many feel archery's worst enemy is the lack of knowledge of equipment when purchasing. This often results in acquiring too heavy a bow for the age and physique of the beginner archer.

Before one can purchase equipment, one must have

Drawing the Bow (using a sight)

When shooting with a sight, special effort must be made to keep the bow vertical at full draw and not canted or held on an angle. The drawing hand comes back under the jaw bone until the bow string rests snugly against the center of the nose and chin. Muscles of the arm, shoulder and back should be used in sequence during the draw. Right elbow moves in a line parallel to the ground. The string moves in a line close to the bow arm during draw.



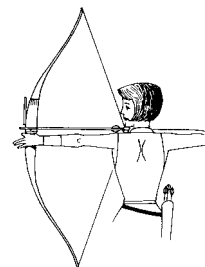
The Anchor - The anchor is the archer's key to consistency because the arrow's trajectory is dependent on the amount of force applied to it and the amount of draw governs the weight applied.

Also, the eye becomes the rear sight and must be a consistent distance above the arrow. Both these factors understate the extreme importance of a good solid anchor. With both barebow and sighted (recurve), it is necessary to be sure to have the side of the hand pressed tightly against the side of the face or under the jaw bone.

Hold and Aim (barebow) -

This is sometimes referred to as the hunting aim and is favored by many instinctive style bowhunters.

Basically, one lines up the arrow with the target and lets go. No short course can be given here as it takes much practice and experience.

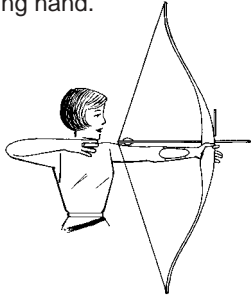


Hold and Aim (recurve) - After the archer is at full draw, the string, sight and target are lined up and the sight held in the center of the target. This position should be held momentarily to ensure there is no movement upon release. Considerable effort is required to maintain full draw and to keep the arrow from creeping forward before the release action takes place. By consciously thinking of continuing to pull while slightly pushing, the possibility of creeping is lessened.



The sight pin is super imposed over the center of the target. The string is positioned on the center line of the bow just to the right of the sight pin.

Releasing - A live release is the normal reaction of the drawing hand moving back as the string rolls off the relaxing fingers. This backward movement is caused by the continued pressure of the shoulder and back muscles in the latter part of the hold cycle discussed above and is initiated by relaxing the fingers of the drawing hand.

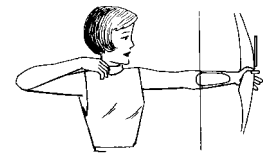


It may look like the fingers are quickly pulled away, but this should not be the case. A release which does not move after the shot is called a 'static' release, and it is employed by some barebow shooters.

Follow Through - The follow through is as important in archery as it is in any other sport. Considerable effort is necessary to stay at full draw for any length

of time and instant relaxation at the moment of release is natural.

The danger in this is the fact that the archer may start to relax before the arrow leaves the bow, resulting with a less than consistent aim and tension leaving poor



groups on the target. The archer must endeavor to maintain his form until the arrow hits the target. Only then should the position of follow through be checked.

After the follow through observe the effects of the actions taken and learn to distinguish between the good and bad reactions. After a short while you will be able to correct your own form to maintain uniformity.

It is generally acknowledged that more points are lost by failing to observe proper follow through than by any of the other steps. All the concentration on the other steps will go for naught if proper form is not maintained throughout the sequence.

Relaxing - After each shot you must relax all the muscles used in shooting. The length of time needed is in direct relation to the condition of your muscles at the time, so it follows that as you become more experienced and tone your 'archery' muscles, the time required will be less. Also, as you become more experienced, this relax time becomes more necessary for 'clearing the mind' than for muscle recovery. In any competition, the archer who can easily and quickly relax has a definite advantage.