



Union Européenne et Méditerranéenne de Tir à l'Arc
European and Mediterranean Archery Union

INFORMATION ABOUT A SWEDISH TRAINING MANUAL

Leif Janson of the Swedish Archery Federation has written an instructive self-educational manual (in swedish) especially suitable for coaching at beginners' level at clubs, which he would like to introduce to those EMAU Member Associations which are interested in using such a manual in addition to the FITA Coaches Manual, level 1.

At present as far as EMAU knows Leif Janson's manual is being used outside of Sweden in Denmark, Finland and Norway where the response is very positive.

A 2nd and 3rd level manual is also ready.

Of course translation from swedish must be done by the interested Federation itself.

The direct contact-address for further information about contents, way of use and cost involved is Leif Janson:

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Eva Thesen, EMAU Councilmember has made a translation of the first chapter, which we add to this information so that interested Federations might obtain an idea about the method of education. In the original manual there are many pictures and also the format is in such a way that it can be used easily.

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Introduction

The Swedish Archery Association

Step - 1

By Leif Janson

We are proud to introduce the Swedish Archery Association's Training Program, hoping that this will prove beneficial for you as an archer and possibly even as a future coach. The program can be as a study group or as a weekend course and aims at qualifying you to participate in your club's training and to prepare you for further studies.

You should have been an active archer or an assistant coach for at least a year to benefit fully from this program.

The program comprises 6 sessions of 3 hours of study or a weekend course of the same number of hours applied. The present material should be made available to the participants who should be familiar with the contents before the commencement of each course.

Recommended development of this course:

Commencement 30 minutes

The coach will introduce himself or herself

The participants similarly introduce themselves stating which club they represent, how long they have been active in archery and describe which function, if any, they have within their clubs. The coach will then describe the progress of the course, duration of each session, pauses, mealtimes etc.

Basic Anatomy 2 sessions

20 minutes will be spent on the skeleton; particularly that children's and juveniles' bone structure is not fully developed until puberty, and further how muscles are constructed.

The next 40 minutes we be devoted to physiology with a study of the muscles, how they contract and how they are governed by connecting nerves.

The next 30 minutes should cover biomechanics insofar as to give an understanding of the importance of all details of stance, balance, positioning of fingers etc. to form a positive basic technique.

Shooting technique 1½ lection, partly theoretical

A basic study of stance, grip, release and follow through. After a theoretical definition of the different steps in the shooting sequence, the participants can go directly to the field and demonstrate what they have understood from this lection.

Materiel maintenance 3 sessions

Basic knowledge about how to maintain your equipment, about spine (the arrows hardness and weight) and the arrow's design (gravity and vanes) and how to trim your equipment.

Method of training 1 session

What is training? How to improve strength and endurance in archery? Some information about the existing Anti-doping program. The Swedish Archery Federation's Antidoping program, rules and exceptions. There should be a handout from a pharmacy about different substances.

How to be a coach 1 session

How to improve the participants' knowledge of imparting instruction through a basic course. How to start a session? What is most important to teach about archery and how to do this well.

Practise archery 5 sessions

A basic course for the instructors. Start by dividing the participants into groups of three, where one will shoot and the two others will discuss how to instruct the archer. The coach will go through the whole sequence of archery. The participants will all shoot and instruct. The coach will also demonstrate trimming of the equipment.

Mental training 1 session

The coach will go through the basic elements: blinking, breathing, relaxation (a beginning in the lesson of learning to know your own body)

End of course 30 minutes

The coach will briefly summarize the course. The participants will share their impressions and reflections on the topics in this course. Diplomas will be given out to all participants.

If you want to study further on your own or in a study group, the following recommend literature may be useful:

SISU idrottsböcker (The Swedish National Sports Study Organisation) have a wide range of related literature about sports scientific topics for further studies.

One recommended title is 'Avspänd Teknik', Leif Janson (1995), SISU idrottsböcker. This book presents a technique of training in connection with how we mentally think and plan. In addition to a basic study on how our body functions, there are many examples on how professional athletes practice their techniques.

The Swedish Archery Association's educational program:

Training planner

Material technique

Field Archery

Session 1

Anatomy/Physiology (60 min)

Anatomy is a science that describes how our organs function. We will see how the skeleton and muscles work. We will concentrate on the bones and muscles that are most valued for an archer.

Physiology is the science about how our cells and organs functions. During anatomy lessons we will see how the involved muscles function from a mechanical viewpoint. Most important is to demonstrate the functions and this means that we will not separate these two sciences in this chapter.

The skeleton

In our body there are ca 106 bones (the amount may vary because of the variation in the number of tailbones).

Most of the bones that are important for archers are formed as pipes and consist of a shaft (diaphyse) and two end pieces. Fig. 1. The bones in our legs are the largest. They tolerate high pressure when we carry something heavy. The most important to keep in mind is that when we use a proper stance, we can also make the best use of our legs when we are standing still. The archer will have to relax in all the muscles that are not in use for the shot. A firm and stable stand gives the best possibility for a good shoot.

If we disregard the importance of the foot position, it will be difficult to perform well. Read more about in the chapter on shooting sequence.

Kids and juveniles have some time until their bones are fully developed (this process is finished just after puberty). When coaching younger archers, the coach must keep this in mind. Thus it is vital that youngsters develop their technique before they advance to stronger bows. We recommend that young archers use bows they are able to stay in full draw for 1 minute; this bow is well adjusted to the individual.

A firm and stable stand is important

To have a good stance is crucial in archery, especially in field archery. The distance between your feet should on a flat ground be as wide as your hips. When shooting outside, e.g. on a steep hill it can be necessary to widen the distance. Read more in our material on Field Archery. See fig. 2.

To be able to have a stable stand, it is vital that the point of balance is located correctly. The balancing point is the point located behind our bellybutton. To stand still you should have your point of balance located somewhat towards your toes. This is normally achieved with the archer holding the bow's own weight.

The most valued bones for an archer

These are located in your arms. This is why the coaches talk about your alignment being so important. As for your feet position, your technique gives you the margins on your side in heavy winds and other demanding situation. See fig. 3.

A crucial detail is that the bowstring must be free of the arm

The bones in the arms may vary in shape. See fig. 4. In some cases the archer has either a bow arm that will be hit by the string or they have an arm with a better angle. See fig. 5.

For some archers it is necessary to learn to rotate the arms to avoid impact in the arm or in the clothing, which will result in poor shooting. This is a more common problem than first appears. It may be difficult to teach the archer to control the bow arm, but it will be worth the effort and hard work to correct this. Teach the archer to rotate the arm to avoid an impact from the string or to enlarge the angle between the flight of the arrow and the bow arm.

Young archers

Children will go through a so-called bone formation process until they finish puberty. This process will start in the middle of the bones, which are softer and like cartilaginous tissue for younger kids. They have smaller bones e.g. in the hand, where there are large spaces between the bones. See fig. 6. After puberty our bones will be more or less the same as a grown-up. It is important that a juvenile do not have too heavy or too strong a bow. This is also the reason why young people should not lift weights at an early age. A Norwegian survey shows that young athletes who began weight training before puberty gained nothing from this training. It is wiser to train the coordination between the nerves and the muscles. We call this Technique training.

The muscles are cross-stripped bundles of so-called muscle fibres.

The muscles are a mix of different proteins, which make the muscles contract so that the muscles shorten and the bones move towards each other. See fig. 7.

We recommend the archer to stand at a full draw throughout the whole shooting sequence. The archer who shoots like this does a concentric muscle work. It is very important for the recurve archer to maintain the movement in the muscles of the back throughout the whole shooting sequence and not to stop. Once the movement is stopped, it will be a heavier task to start the movement again. See fig. 8.

This is called a concentric muscles movement. It is vital that this happens correctly when starting the shooting sequence. An archer who shoots with a draw check indicator (clicker) and stops to aim and hold still will have a harder task drawing the arrow passing the clicker. A 40 # recurve bow will in this respect amount to a 60#. A muscle that is locked or stopped in a movement is destroying a good shooting technique. When we take down a bow without shooting the arrow we call this eccentric muscle work.

See fig. 9.

We perform eccentric muscles movement when we relax our hand at full draw while holding the string or the release. You relax your fingers until you feel stronger. This way you can increase your endurance (up to 30%) and also it will partly make it easier to release the string. The relaxation in your lower arm and the small movement you do with your fingers will function best when done at the end of the shooting sequence. To work with a relaxed technique will reduce the risk of a sudden movement at the release when aiming and standing at full draw.

Some points about mobility

Some muscle fibres build bundles, which are surrounded by fascia. There are three levels of fascia of muscles. The inner ones surround the muscle fibres and hold them together; the middle one binds bundles of muscles and the third type cover the whole muscle. See fig. 10.

If you work out without working especially with mobility it is possible that these fascias will seem shorter. The risk is that you will end up with less mobility, less strength and poorer technique. It is necessary before and after every training session to have a program to improve your mobility. A five minute warm-up will do magic. If you teach the young archer to warm-up and a program to wind down after each shooting practice, this will be a normal part of every practice session. The archers practice their mobility, might not need stretching. A good muscle movement and soft muscles give a better feeling. In your next study program, we will teach you how to work with stretching. It is a necessary evil in some cases. If you have trouble with your muscle movement it is seldom something wrong in the skeleton. It is the muscles that are too tight so that some movements are difficult to perform. If we adopt a good alignment and we ascertain free movement of our arms, we can proceed.

Fig 10.

Cross-section of a muscle showing the three components. The dark fascia enclosing each section needs to be stretched with its muscles section after training to counteract contracting which impedes shooting.

Biomechanics (30 min)

Deriving from early physics this translates as "living engine" or how to make your body work. Our concern is to apply the mechanics to exploit the best angle to the target to facilitate holding still, maintaining the bow aimed whether in dry training or to shoot. If in dry training only we are in a static mode without muscle elongation, if in shooting, we are in a dynamic mode. Our legs are biomechanical stabilizers. The importance of a correct stance has been covered. Of equal importance is getting our arms work optimally. Drawing the bow involves a great number of muscle groups to get this completed to where the load can be borne by the torso and the arm. Fully drawn the arrow should have a minimal angle to the drawing arm with this arm resting against the shoulder with the body aligned as best possible. Try rotating the pelvis to find the best stable position possible. Later in this study on the subject of shooting techniques, you should consider this. Tips on improving your performance will be given.

Nerves and muscles

Muscles will act only on impulses brought to them by our nerves. These are very complicated and originate in our spine extending from a centre through thin nerve fibres all the way to the furthest muscles in our fingers and toes. We can consciously influence our muscles to act by sending messages through the nerves causing the muscles to perform as we wish. If we decide to grip our bow, that decision is transferred into a series of automated motions governed by our brain, generating through the network of nerves a series of muscular movements resulting in the desired gripping of the bow totally without conscious effort on our part. The nerve from our spine and the muscle fibres performing the task on the signals of that particular nerve, constitute a motoric unit. The more complicated the task, the fewer motoric units are involved.

A badly executed task resulting from insufficient training will involve unnecessary motoric units and cause a lot of surplus energy being expended. Similarly nerves will transfer information from your body through your spine and further to your brain, e.g. to tell you if your fingers are correctly placed when you pull your bow. Nerves carrying information inbound are called afferent nerves.

Fig. 11

Nerve cell: From dendrites (treads around the cell body) information is transported to the cell while an axon delivers information to the muscle cell.

Blood circulation

Our veins supply all organs including muscles with necessary fuel, glycogen for quick energy and slower burning fat for endurance.

Physiology

Training will influence muscles in two ways. They can grow to be able to provide more strength or to have a greater endurance. Compare, if you will, the muscle capacity of a weightlifter (body builder) to that of a long distance runner. Our next part of the course will deal with this aspect.

Training brings results – we are concerned with training in archery. We need to train and build muscles that will help us reach our goals in archery.

For further discussions

- 1) *Why is it vital that a young archer have a lightweight bow?*
- 2) *Why should an archer keep up the movement (and never stop or lock a muscular movement) at full draw?*
- 3) *What important biomechanical reasons must be considered when learning a new technique?*
- 4) *Consider what part of your training that is of great importance to you as an archer.*
- 5) *What is the relation between the number of motoric units and a good or bad shooting technique?*
- 6) *What does a motoric unit consist of?*
- 7) *Discuss the meaning of "good working angles".*