



4th WORLD ARCHERY COACHING SEMINAR

Rome, Italy

3-6 November 2009

FITARCO - Federazione Italiana di Tiro con l'Arco



Experiences and operations in archer's physical preparation

By Prof. Roberto Finardi (FITARCO Responsible for physical preparation)

- The Archer as a cybernetic system
- The necessary physical qualities for a modern archer
- Planning and programming: definition of the training tasks and objectives with specific reference to the season's periods
- The development of the conditional qualities: strength, speed, resistance
- The development of the coordinative qualities



The Archer
is a cybernetic system:
i.e. an organism capable of
carrying out a series
of self-regulation proceedings
through continuous adaptive
controls .



- **Adaptive control involves modifying the control law used by a controller to cope with the fact that the parameters of the system being controlled are slowly time-varying or uncertain**



- Physical training must integrate, as much as possible, the conditional elements and the coordinating ones, in the archery system
- Both of them must be absolutely functional to the athletic movement.
- One of the priorities in physical training, is the integration of the conditional and of the coordinating, of the so called “Archery system”.





4th WORLD ARCHERY COACHING SEMINAR

• PSYCHOMOTION

FITARCO - Federazione Italiana di Tiro con l'Arco



- FROM A QUALITATIVE AND SHOOTING TECHNIQUE DEVELOPMENT POINT OF VIEW, IMPROVEMENTS HAPPEN ONLY IF THE CONDITIONAL PARAMETERS ARE DIRECTED IN A CORRECT SELFACCEPTOR DIMENSION, TIME AND SPACE MUST BE REGARDED EXACTLY AS PHYSYCAL SIZES.





4th WORLD ARCHERY COACHING SEMINAR

- The decoding of the self-acceptor and ethero-acceptor signals, the eye-hand coordination, the space and time orientation, the athlete's projection made even bigger by the presence of a piece of equipment, are the discriminating variables that must be decoded by archers in order to perform better.





4th WORLD ARCHERY COACHING SEMINAR

- A cybernetic system must be able to integrate as much information as possible, so to have it reappear in different levels of action
- From here the need of a multipurpose and multilateral preparatory physical training



- **COMPETITION SCENARIO (self control)**
- **Controller >>> system to be controlled >>> output**

- **TRAINING SCENARIO**
- **> system to be controlled > controller > system to be controlled > output**



- **Definition of closed skill:**
- **“Sports gestures characterized, by as much as possible, precise repetitions, of a certain automatic movement, where any external input is constant and predictable”.**





4th WORLD ARCHERY COACHING SEMINAR

**THE BEST
ADAPTMENT
IS TO NEVER
GET ADAPTED**

FITARCO - Federazione Italiana di Tiro con l'Arco





4th WORLD ARCHERY COACHING SEMINAR

- **-INTEGRATION AND DEVELOPMENT OF VARIOUS ABILITIES**
- **-INTERACTION BETWEEN COORDINATING AND CONDITIONAL**
- **-PRIORITY GIVEN TO POSTURAL CONTROL**



THE ARCHERS ATTRIBUTES

- 1 THE MOST ERGONOMIC AND EFFICIENT CONTROL AS POSSIBLE, COMING FROM THE BODY'S SUPPORTING SYSTEM. GOING FROM THE INFERIOR ARTS TO THE HEAD, PASSING THROUGH ALL THE JOINTS OF THE KINETIC SYSTEM (IN PARTICULAR HIPJOINT, RACHIS, SHOULDER BLADE/HUMERUS, CERVICAL)





4th WORLD ARCHERY COACHING SEMINAR

THE ARCHERS ATTRIBUTES

2 A SPECIFIC RESISTANCE ON SEVERAL AND DIFFERENT BODY DISTRICTS, SIMULTANEOUSLY IN USE AND WITH DIFFERENT TYPES OF CONTRACTIONS (ISOMETRIC, CONCENTRIC, ECCENTRIC)



THE ARCHERS ATTRIBUTES

3 AN EXCELLENT CARDIOCIRCULATORY SYSTEM, TO HELP REESTABLISH AS QUICKLY AS POSSIBLE THE HOMEOSTASIS CODITIONS.

OR

AN EXCELLENT CARDIOCIRCULATORY SYSTEM, TO HELP REESTABLISH AS QUICKLY A DYNAMIC BALANCE CONDITION





4th WORLD ARCHERY COACHING SEMINAR

THE ARCHERS ATTRIBUTES

**4 AN EXTRAORDINARY ABILITY OF CONCENTRATING
EVEN IN SITUATIONS THAT MIGHT RAPIDLY
CHANGE.**





4th WORLD ARCHERY COACHING SEMINAR

THE ARCHERS ATTRIBUTES

5 AN EXCELLENT EYE-HAND COORDINATION

FITARCO - Federazione Italiana di Tiro con l'Arco





4th WORLD ARCHERY COACHING SEMINAR

THE ARCHERS ATTRIBUTES

6 HIGH DEGREE OF DEVELOPMENT OF THE ETHERO-ACCEPTOR AND SELF-ACCEPTOR CHANNELS: CAPABILITIES WITH WHICH THE ARCHER-BOW SYSTEM ADAPTS ITSELF TO THE CHANGING SITUATIONS DUE TO INNER AND OUTER AGENTS, THAT CAN MODIFY HIS MUSCULAR TENSION, POSTURE, VISIBILITY ETC.





4th WORLD ARCHERY COACHING SEMINAR

THE ARCHERS ATTRIBUTES

7 HIGH DEGREE OF FLEXIBILITY' AND ARTICULAR MOVEMENTS.

FITARCO - Federazione Italiana di Tiro con l'Arco





4th WORLD ARCHERY COACHING SEMINAR

THE ARCHERS ATTRIBUTES

8 SPEED AND RAPIDITY, NOT AS MOTION/SPEED BUT AS CAPABILITY OF MAKING RAPID MOVEMENTS IN A VERY REDUCED TIMING





PLANNING

- LEARNING
- DEVELOPMENT
- INTEGRATION
- CONSOLIDATION
- NEXT OBJECTIVE





4th WORLD ARCHERY COACHING SEMINAR

- **THE NEED OF INTEGRATING THE NEW MOTION INFORMATION, BOTH CONDITIONAL AND COORDINATING ONES, IN A SEQUENCE OF GESTURES, CHARACTERIZED BY A GREAT PRECISENESS AND FLUIDITY, DEMANDS A METHODOLOGIC PROGRESSION IN THE CHOICE OF THE MEDIA AND IN ITS MANAGEMENT, BOTH FOR QUANTITY AS FOR QUALITY.**





4th WORLD ARCHERY COACHING SEMINAR

- The need for a “development-integration” working method, compels us to a particularly careful and non-invasive management, so to permit the integration of the new elements acquired in the technical gesture.





4th WORLD ARCHERY COACHING SEMINAR

- **The conditional and coordinating elements must live together, and develop in the same way throughout the year, through a wise management of volume, intensity and of all the training equipment chosen**





4th WORLD ARCHERY COACHING SEMINAR

- 1 great variability of the media used in order to avoid stereotyped answers
- 2 strong alternation of intensity and volume within the equipment used
- 3 valorization of the recovery days (unloaded or active rest)
- 4 guarantee full recovery through regeneration equipment
- 5 avoid too long-lasting power training sessions, mostly the volume ones, that besides putting the athlete in great difficulty during the building up of the power itself, can cause a protracted stressful situation that might negatively influence technical action, both in the building and in the transformation moments.





4th WORLD ARCHERY COACHING SEMINAR

- 6 avoid in the same training session, to use agonist and antagonist muscles
- 7 perform any training that might require a strong involvement of the central nerve system only when fresh and mentally alert





4th WORLD ARCHERY COACHING SEMINAR

- **Tiredness often modifies our muscular tension and the successive muscular contractions, thus making us loose our fluidity and discerning chronology in the contraction series.**





4th WORLD ARCHERY COACHING SEMINAR

- **When shooting, with its high level of strength generally distributed throughout unusual body districts, the risk is to compensate the temporary power deficit with the use of an unusual body district**

4th WORLD ARCHERY COACHING SEMINAR

- THE DYNAMIC TIMING ,THROUGHOUT THE YEAR, OF THE COMPETITION CALENDAR, DOESN'T ALLOW THE APPLIATION OF A “MATVEEVIAN” MODEL, SPECIALLY FOR WHAT CONCERNES DOUBLE PERIODS
- IT MUST BE REMINDED THAT MATVEEV'S MODEL RELATES TO SPORTS WITH A CLEAR CONDITIONAL DOMINANT SIDE, AND VERY OFTEN THIS DOMINANCE IS STRENGTH
- CONDITIONING CYCLES THAT ABSORB 75% OF THE UTILIZED EQUIPMENT, CAN VERY HARDLY BY APPLIED IN A REASONING OF DEVELOPMENT OF A MAINLY PSYCHMOTIVE SPORT





4th WORLD ARCHERY COACHING SEMINAR

- **THE KIND OF TRAINING THAT WE HAVE UNDERTAKEN DOES NOT FORESEE, IN ANY MOMENT OF THE YEAR, A STRICT AND UNILATERAL DEVELOPMENT, OF ONE CONDITIONAL ELEMENT OVER THE OTHERS. ON THE CONTRARY WE ARE RESEARCHING A MULTILATERAL AND MULTIPUPOSE DEVELOPMENT**



MEDIA UTILIZED IN THE SELF-ACCEPTOR CHAPTER

- SITTING DOWN
- STANDING UP:
 - NORMAL SURFACE
 - SAND
 - UPHILL
 - DOWNHILL (PROMINENT ECCENTRIC PHASE)
 - WITH EXTRA RESISTANCE (RUBBER BANDS, ETC.)



MEDIA UTILIZED IN THE BALANCE CHAPTER

- **FIXED POSITION SINGLE AND DOUBLE FOOTED (ISOMETRIC OR ECCENTRIC)**
- **IN DYNAMIC SITUATION WITH PREFERENCE FOR THE ECCENTRIC/CONCENTRIC CYCLE (SMALL JUMPS, CHANGES OF DIRECTION, AND POSTURE)**
- **BURDENED SITUATIONS (WITH EXTRA BURDEN, OR ON UNEAVEN SURFACES)**
- **BALANCING COURSES**
- **BALANCING COURSES WITH APARATUS WORK**
- **BALANCING COURSES - BLINDED**
- **BALANCING COURSES - BAREFOOT**
- **BALANCING COURSES WITH PARTS OF THE BODY IMMOBILIZED**
- **BALANCING COURSES WITH DISTURBING ELEMENTS**
- **SELF-ACCEPTOR TABLES**
- **MOVING SURFACES (GYMBALL,ETC.)**





4th WORLD ARCHERY COACHING SEMINAR

MEDIA UTILIZED IN THE N.C.S. CHAPTER.

- GENERAL REACTION TIMING TO DIFFERENT STIMULI (VISUAL, TACTIL, ACUSTIC, ETC.) SINGLE AND/OR COMBINED.
- HAND AND FOOT REACTION TIMING (DOUBLE AND SINGLE FOOTED)
- EXERCISES FOR **BODY-SPACE-TIME** RELATION
- WITH A TIME/SPACE RESISTANT, EYE, EYE/HAND, ETHERO-ACCEPTOR DOMINANCE,



MEDIA UTILIZED IN THE POSTURAL CHAPTER

- **Ambulation (imitative gait) with suspension loading and stretched arms**
- **Uphill ambulation (i.e..) with suspension loading (stretched arms)**
- **Downhill ambulation (i.e..) with suspension loading (stretched arms)**
- **General postures standing, prone, supine, with extra traction created by elastics and hyper gravity: eccentric, concentric and isometric.**
- **Postures on vibrant footboard or on any moving or unusual surface.**
- **P.S. according to the objective, tractions and extra-loading is placed either on the barycentre or on the various body segments.**



MEDIA UTILIZED IN THE CARDIOVASCULAR CHAPTER

- SLOW CONTINUOUS JOGGING UNDER SPEED THRESHOLD
- VARIATION OF RHYTHM (FARTLEK)
- REPETED TRIALS (RARE LACTIC ACIDOSIS EPISODES)
- GENERAL TRAINING CIRCUIT
- SPECIFIC TRAINING CIRCUIT
- MIXED TRAINING CIRCUIT
- TRAINING CIRCUIT WITH SHOOTING EXERCISES



MEDIA UTILIZED IN THE RESISTANCE CHAPTER

- RESISTANCE REFERRED TO SHOOTING EXERCISES
 - RESISTANCE REFFERRED TO AGONIST MUSCLE DISTRICTS
 - RESISTANCE REFFERRED TO ANTAGONIST MUSCLE DISTRICTS
-
- **NOTE: THE DISTRICTS ARE TRAINED ACCORDING TO THE KIND OF CONTRACTION MADE DURING THE COMPETITION.**





4th WORLD ARCHERY COACHING SEMINAR

MEDIA UTILIZED IN THE JOINT MOBILITY AND FLEXIBILITY CHAPTER

- Active and passive stretching
- Leaps



MEDIA UTILIZED IN THE MUSCLE CHAPTER

Eccentric and concentric training sessions

Exclusively eccentric training sessions

Exclusively concentric training sessions

Isometric training sessions

Combination style training



MEDIA UTILIZED IN THE OSTEO-VESTIBULAR ADAPTATIONS CHAPTER

- Basic acrobatics
- Balance exercises, also with extra difficulties (with severe audio and visual disturbance)
- On a balance beam, unusual surfaces (trampoline, big mattress, etc.), or on self-acceptor footboard



MEDIA USED FOR SHOOTING TRAINING SESSIONS IN MODIFIED SITUATIONS

- Visual modifications
- Spatial modifications
- Postural modifications
- Osteo-vestibular modifications
- Auditive modifications
- Tactile modifications (hands and feet)



BREATHING

- BREATHING RHYTHM
- APNEA
- APNEA WITH DEFINED MOTION TASKS

