SOME BASIC HINTS TO YOUNG DISCUS THROWERS

By Lawrie Barclay

New South Wales hammer throw coach, Lawrie Barclay sums up the fundamentals of the discus throw in five major phases from the wind-up to the delivery in order to give young athletes and their coaches a basic understanding of the discus throw technique.

The discus throw is probably the most technical of all the throwing events in the track and field program and therefore the hardest to master. In what follows this author has tried to present the basic aspects of the discus throw broken down to its major components.

THE WIND-UP

Start facing the back of the circle with your weight evenly distributed between your feet and your fight foot flat on the ground. Your feet should be about shoulder width apart and your knees should be slightly bent. Take the discus out in a wide sweeping action as far from the body as possible while keeping your weight between your feet. Try to avoid taking too much weight on to your right foot. Try to keep your knees bent. There is no need to take more than one swing. The purpose of the swing is only to set the discus in motion. Balance is most important here.

THE TRANSITION

From this position shift the left shoulder over the left knee and try to keep them locked together as you turn to face the front to begin the "run" across the circle. This is a most important part of the throw as an overactive left arm will cause the upper body to move before the legs and the discus will move ahead of the hips. This will reduce the final pull and therefore destroy the throw.

THE RUN ACROSS

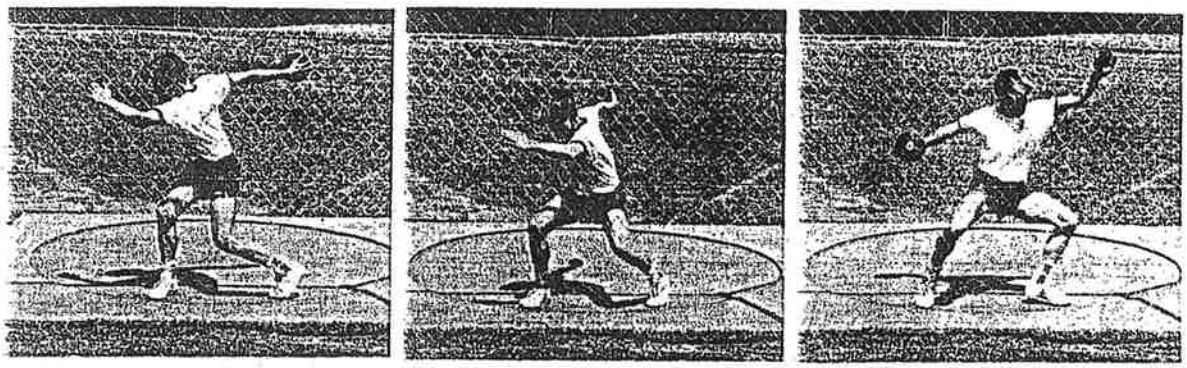
When the body weight has been transferred on tot he left leg you begin to pivot on the inside ball of the foot. When the left foot is facing down the left section line bring the right leg around in a wide sweeping motion, making sure to lead with the inside of the thigh and not the knee. Push off with the left leg and bring the right foot around to land facing down the left sector line and not facing the back of the circle. This is a major mistake!!

THE TURN IN THE CENTRE

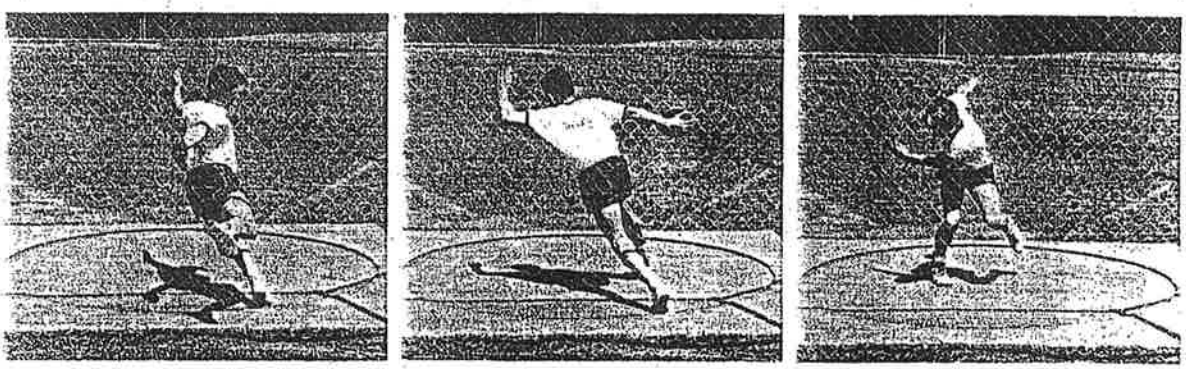
From this position rotate the bent right leg around to the front and try to get the left foot down as quickly as possible, while keeping the discus above the shoulder and trailing behind the right hip. This action is the most important part of the throw as it allows the hips to get around to the front ahead of the discus.

THE THROW

The left side of the body should now stop its rotation. (This is called blocking). It can be made easier by shortening the left arm and pulling it into the body. The right leg now straightens and the discus is delivered at shoulder height as far from the body as possible. Try to deliver the discus as "tall" as you can over a fixed left leg.

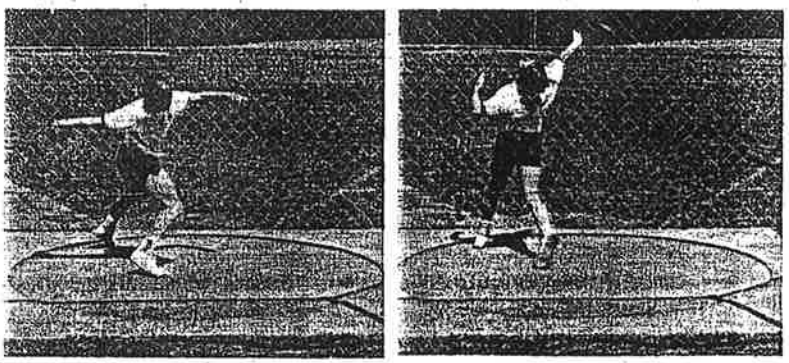


THE WIND-UP AND TRANSITION



THE RUN ACROSS

THE TURN IN THE CENTRE



THE DELIVERY

THE DISCUS THROW

The photo sequence shows the technique of Hayden Knowles, who at the age of 13 threw the 1kg discus over 59m

SUMMARY

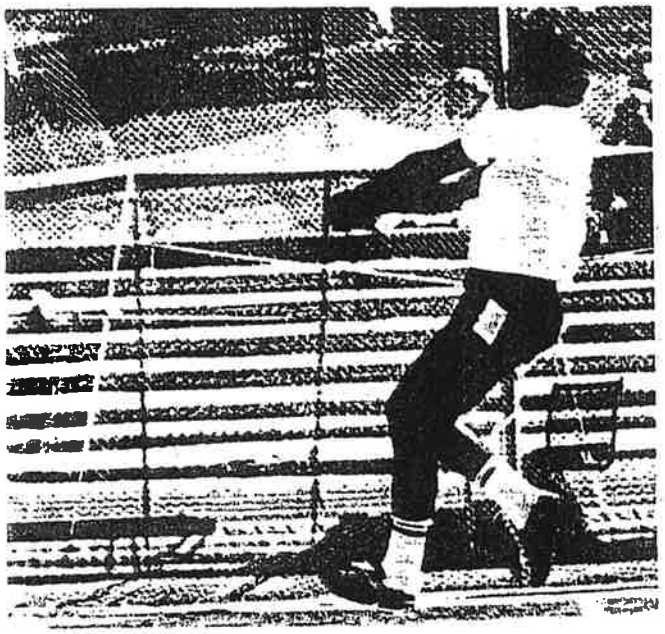
Try to think of the discus throw as a running rotation and not just two little "spins". Starting slowly you turn to face down the left sector line, run to the centre, rotate 360 degrees on your right foot, block and deliver. Most of the top discus throwers in the world are in their mid to late twenties and beyond. As you can see it takes a lot of time and patience to master the art of discus throwing, but if you train hard and try to practise the things I've said, you can make it.

Good luck!

HINTS FOR BEGINNER HAMMER THROWERS

By A.P. Bondarchuck

One of the world's best known hammer coaches, Anatoli Bondarchuck, discusses the learning and initial development procedures in the hammer throw, looking at different learning tasks and the correlation between technique and physical conditioning. The article is based on translated extracts from the author's book The Hammer Throw, published in Moscow (1985).



The format of the movements, as well as their content, make up the hammer throw technique. Coaches and athletes, who underestimate this are making a grave mistake, because the learning of the technique must occur parallel to the development of specific power. It should be added also that there is no correlation between the physical preparation level of an athlete and his form, refelecting basically different movement characteristics. Improved results in lifting weights do not guarantee better hammer performances.

Three methods, the whole, the part and the mixed approach, are used in the learning and the development of the hammer throw technique. Most progressive and effective is the mixed method, where the learning of the

technique is based on a combination of the whole and the part methods. This is because it is rather difficult to execute the complicated movements of the hammer throw as a whole. The centrifugal force, even in mediocre throws, makes a rational distribution of power very complicated.

LEARNING PROCESSES

The learning process of the hammer throw takes place in three basic phases, namely:

1. The establishment of a correct image of technique.
2. The learning of the basic technique elements (preliminary swings, turns, delivery).
3. The development of the throwing techni-

Particular emphasis must be placed on the first learning phase, made up from the following tasks:

1. *The establishment of a correct understanding* of the basic elements of the technique and the structure of the throwing rhythm. Methods: The explanation and demonstration of the technique as a whole and in parts (films, photos, drawings, videos).
2. *The learning of preliminary swings.* Methods: Swings with the left, the right and both arms (poles, different weight hammers).

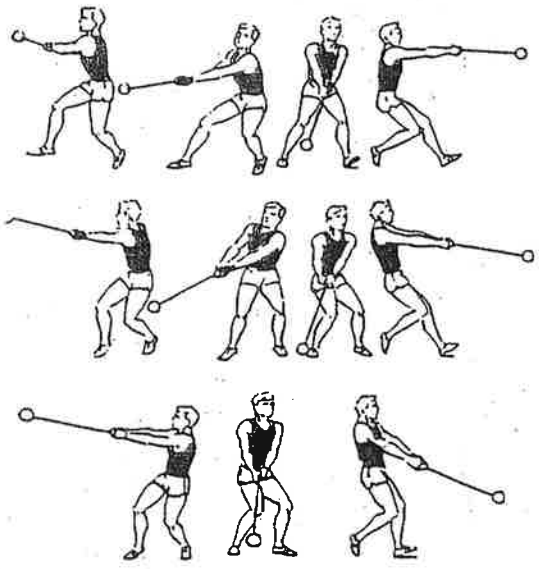


FIG. 2 DOUBLE SUPPORT (ABOVE) AND SINGLE SUPPORT (RIGHT) PHASES IN THE FIRST, SECOND AND THIRD TURN

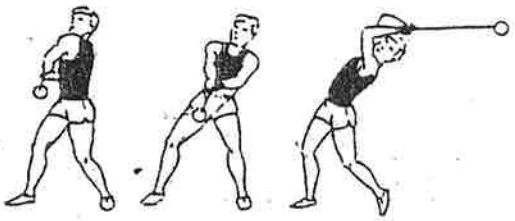


FIG. 1 PRELIMINARY SWINGS

Suggestions: Attention in the preliminary swings is directed to the compensating movement of the body in the opposite direction to the hammer movement. When the hammer is situated on the right of the athlete, the thrower's body mass is shifted more on the right leg. At the moment the hammer is in front or behind the athlete, the body leans a little back or forward, with the weight distributed evenly on both legs. The compensating shifts in the horizontal plane are important for an efficient transfer into the first turn.

It is advisable to perform preliminary swings at different speeds, observing that the lowest point of the hammer plane does not shift to the left. It must be kept in mind that this is not possible when the speed increases, forcing the athlete to let go of the hammer or break its movement with the ground.

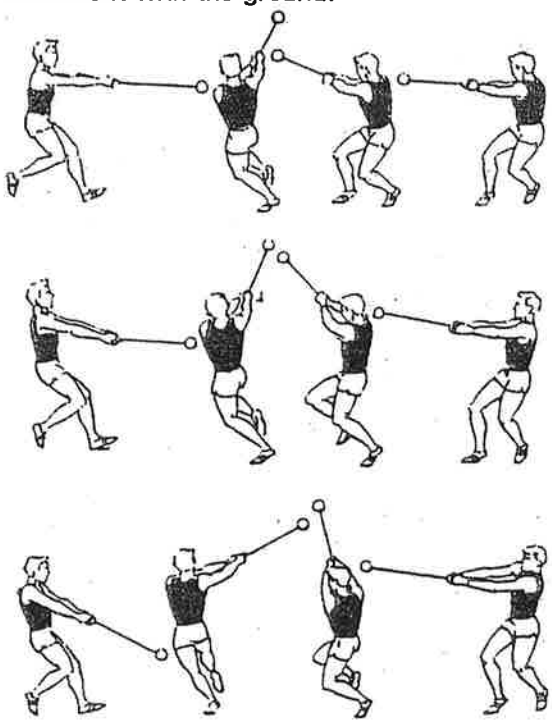


FIG. 3 THE DELIVERY

The legs should be slightly bent and the arms stretched as much as possible, particularly when the hammer is at its highest point after passing the frontal plane of the shoulders and the axis of the hips.

3. *The learning of the turns.* Methods: Turns without the hammer and with different weight hammers.

Suggestions: The hammer must be actively accelerated by the arms, shoulders and body in the double support phases until the axis of the frontal plane meets the hip axis and even further in the transfer to the first turn. Every following turn should be faster than the previous one.

The movement of the shoulders and arms must be reduced as much as possible in the single support phase, during which the athlete performs active work with his right leg and the right hip. This allows to keep balance and leaves the arms virtually straight.

4. *The learning of the delivery.* Methods: Throwing of the hammer left-upward-backward after one, two, three or more turns. Throwing of weights with a handle and shots in the same way, only with the left or with both hands.

Suggestions: The author does personally not recommend to teach the delivery from one turn only, as the effectiveness of the delivery depends largely on a rational rhythm and the execution of the preceding turns. Athletes, who can perform an excellent delivery from a standing position, or after one turn, will not succeed when they lack rhythm and have made mistakes in the turns.

The learning and development of the final delivery should receive less attention than the preliminary swings and the turns in training.

5. *The establishment of the whole technique.* Methods: Throwing of different weight hammers from three or four turns.

Suggestions: Attention in the teaching of the hammer throw as a whole is directed to the rhythm of the throw. The intensity is also important and learning should therefore take place with restricted or medium efforts. Some maximum effort throws at a certain stage of the learning process are acceptable, but should not exceed 10 to 20% of the total throws. It is also important to make sure that the hammer and the athlete are not turning together (as in the discus).

The development of the hammer throw technique basically makes use of the same methods that are employed in the learning stages, namely the throwing of different weight hammers. However, the number of low intensity throws is reduced and employed mainly in the specific warm-up. The number of medium and high intensity throws, on the other hand, is increased with maximum effort deliveries reaching 25 to 30% of the total. The main emphasis is always on a rational rhythm of the throws.

In general, it is advisable to begin training with low intensity loads, followed by maximum and finally medium intensities. This is advisable because low intensities are effective in the learning of single technique elements, as well as the development of the technique as a whole during specific warm-ups. Medium intensities, employed at the end of training, have a most positive influence on the recovery processes.

TECHNIQUE AND PHYSICAL CONDITIONING

The development of technique must occur parallel to the development of power capacities. An artificial separation of these two elements has a negative influence on the improvement of performances. It must also be kept in mind that a good technique, achieved through throwing with medium loads, has little carry-over value to maximum effort throws. Improved performances are therefore achieved by employing a gradually increasing number of maximum effort throws.

Experience has shown that the world's best hammer throwers pay equal attention to the development of power and technique in all training phases of a year. Contemporary

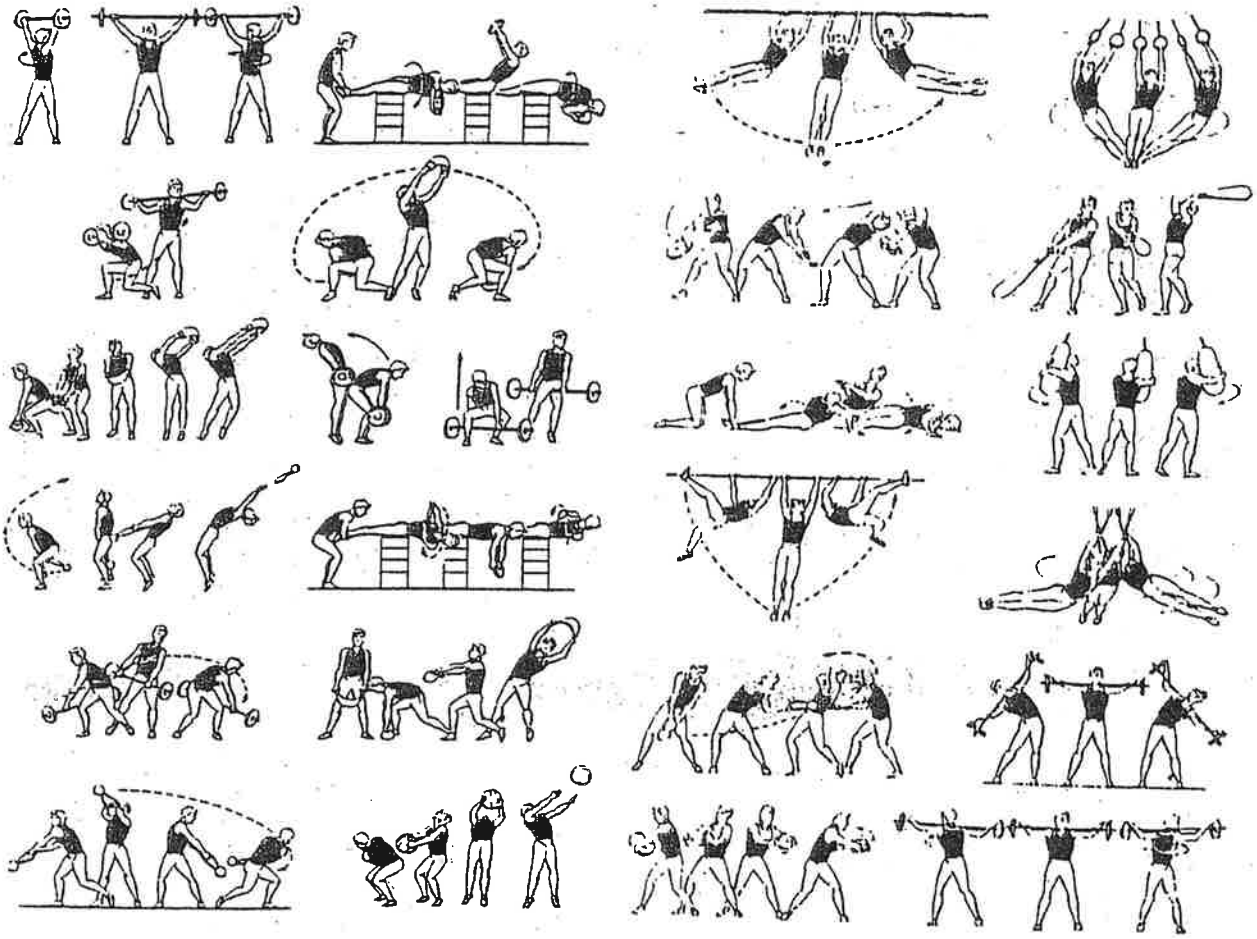


FIG. 4 SPECIFIC CONDITIONING EXERCISES FOR HAMMER THROWERS

throwers are not dividing workouts into ength, speed, technique etc. trainings. This one reason why the Soviet hammer exponents have over the last 10 years dominated the world rankings.

Coaches, who advocate a separate development of physical capacities, are obviously ignorant of the use of varied weight hammers and that the employment of different intensities allows the improvement of physical capacities together with technique development.

Low intensities (20 to 50% from maximum) in strength development, such as in weight exercises, have a positive effect mainly for beginners and low level performers. As the athlete improves, so does his need for medium and maximum intensities. The number of repetitions in the first case is around 7 to 10, reduced, as the athlete improves, to 3 to 5. Physiologists recommend not to exceed 20 repetitions in low intensity lifts, as this will develop mainly strength endurance.

The principles used in weight exercises apply also to the throwing of varied weight implements, particularly to the heavy implements. It should be noted that the world's best hammer throwers used throughout the year systematically heavy (8 to 16kg) hammers to develop dynamic power.

The intensity of the throws with a normal weight hammer is based on percentages from the best training throw during a certain period of the year as follows: low — 50 to 80%, medium — 80 to 90%, maximum — over 90%. The best positive results are achieved in using in one training session 2 to 8 maximum intensity throws. The order of different intensity throws is made up from 5 to 6 low, followed by 2 to 8 of maximum and finally the required number of medium effort deliveries.

THE DISCUS THROW

DESCRIPTION

The thrower stands at the rear of the circle, with the back facing the direction of throw. The athlete makes preliminary swings and fully extends the arm so that the discus is behind the right hip at shoulder height. From this position the athlete pivots on the ball of the left foot and with the sweep of the right leg, drives across the circle. The athlete lands near the middle of the circle on the ball of the right foot and quickly extends the left leg to the front of the circle. The right foot pivots to drive the right side forward over a braced left leg and the discus is released at shoulder height with a long, slinging action.

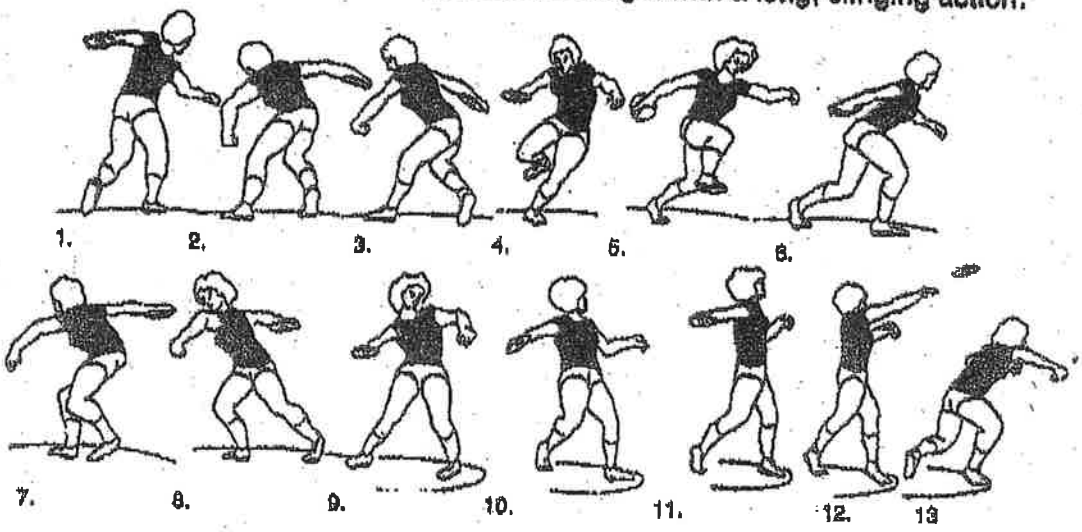


FIG. 1. THE DISCUS THROW

EVENT ANALYSIS

Starting Position

The stance at the rear of the circle is balanced and relaxed. The feet are placed slightly wider than shoulder width apart and the knees are slightly bent. The back is straight and the eyes look forward.

Building up of Momentum

The discus is taken back at shoulder height to a position behind the right hip. The trunk and shoulders follow, producing a 'wound up' position. The left arm is slightly bent and held in front of the body at chest height.

The turn is started by transferring the body weight over the ball of the left foot which pivots, along with the right foot, in the direction of the throw. As the right leg sweeps around, the left leg drives the body across the circle in the direction of the throw. The discus trails behind (Fig. 1, 2-7).

Throwing Position

The ball of the right foot lands in the centre of the circle, the left leg extends quickly to land in the front of the circle. The body weight is over a bent right leg, shoulders are level, facing the rear and the head is upright and in line with the right knee and right foot. The left arm is still slightly bent and held in front of the chest (Fig. 1, 7-8).

Delivery

The right hip is driven vigorously forward by pivoting on the right foot so that the hips face the direction of the throw. The right leg straightens, transferring the body weight forward on to the left leg which extends and the discus is thrown with a long arm slinging action with both feet in contact with the ground (Fig. 1, 9-12).

Recovery

The action of the left leg at the throw is to provide a brace against which the right hip drives. Although this left side will stop some of the rotary motion of the body, after the discus has been released the rotary motion will continue slightly and in order to stay in the circle, the right foot is moved to the front of the circle and simultaneously the left leg is lifted back out of the way. This

2.

TEACHING SEQUENCE

Holding the Discus

The throwing hand is placed on top of the discus, the fingers are spread and pushed forward over the edge until the end pads of the forefingers curl around the rim. The thumb rests on top. The wrist is rigid and the palm is flat against the discus.

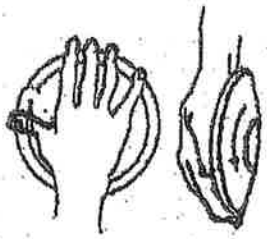


FIG. 3. HOLDING THE DISCUS

Knowing the Discus

Aim: To achieve the correct spin off the fingers, and have the throwing arm in the right path to release.

The discus is released off the index or pointer finger, and this causes it to spin in the air which is necessary for stability of flight.

(a) Holding (as above) and releasing the discus by rolling it along the ground with the index finger leaving last (Fig. 4).

It is a good idea to practice this skill in twos or threes, spaced a suitable distance apart. The discus will travel in a straight line if it is released at right angles to the ground.

(b) Holding (as above) and throwing the discus vertically into the air and making it spin off the index finger (Fig. 5).

The right arm should be kept long and straight and the wrist rigid. The discus should spin smoothly, be vertical in the air and land on its rim. Beginners must watch the discus in flight and ensure that it lands a safe distance away in front of them. The outer edge of the thumb rests gently against the discus and ensures that the flight will be smooth. If the thumb is lifted away from the surface of the discus, the discus will probably wobble in flight.

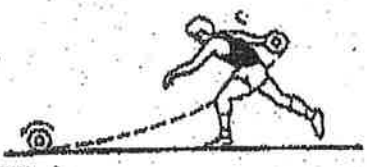


FIG. 4.

FIG. 5.

FIG. 6.

(c) Sideways slinging action

The athlete stands in a position sideways to the throwing direction and holds the discus at the front with the right hand in the holding position and the left hand underneath supporting the discus. Without moving the trunk or legs, the right arm swings back to the rear at shoulder height and then forward in a flat plane to release over the front leg with the discus spinning in a clockwise direction off the index finger (Fig. 6).

THROWING THE DISCUS

Drills progressing to the full throwing action:

Standing throw:

When release drills are correct, the athlete progresses to the standing throw which initiates the delivery from the throwing position (Fig. 7).

Position of the feet

The feet are placed comfortably apart (about shoulder width) at 90° to the throwing direction with the left foot offset to the left to allow full right hip movement. A straight line from the front toe of the left foot will run through the heel of the right foot. Body weight is on the ball of each foot (Fig. 8).

Standing throw

3.

Winding up swing

STARTING POSITION —

- feet correctly placed (as above)
- discus held at the front with the right hand and supported underneath by the left hand
- most of the body weight is shifted onto the ball of the left foot.

TO WIND-UP —

- the right arm swings to the rear in a wide flat circle
- the body weight shifts to the bending right leg with the right foot pivoting to the rear
- the wind up continues until the right foot, right knee and head are in a vertical line
- the shoulders are level
- the right arm is behind the right hip at shoulder height having travelled in almost a full circle.

TO UNWIND —

- the athlete pivots on the right foot thus rotating forward the right knee and hip and extending the right leg horizontally
- this happens against a straightening left leg and blocking left side
- as the right side of the body comes over the left leg the right arm whips around to the side at shoulder height.

There should be three phases in this whole movement:

(I) A deliberate unhurried long movement wind-up.

(II) The unwind when the hips are rotated to the front and the arms and shoulders trail behind.

(III) The unwind of the shoulders when the right arm finishes the throwing movement.

The turn

The purpose of the turn is to have the discus moving before accelerating it further at release. The speed at which the discus is travelling on release is by far the most important factor determining the distance it will travel. The turn can be introduced through a series of drills which progressively lead the athlete to the full throwing action.

Pivoting drills

(I) Half turn pivot:

- the athlete stands at the back of the circle with the feet slightly wider than shoulder width apart
- the body weight is moved onto the ball of the left foot with the trunk and head erect
- in order to maintain a smooth pivoting action, the athlete must stay on the balls of the feet throughout the turn, so the heels must not touch the circle
- the left knee bends slightly as it takes the body weight, but the right leg is kept almost straight
- the athlete pushes off with the right foot and pivots on the left one until the body completes a half turn and is facing the opposite direction
- the right foot lands almost straight but most of the body weight is kept over the left
- these half turns should be repeated several times for balance and co-ordination.

(II) Full turn pivot:

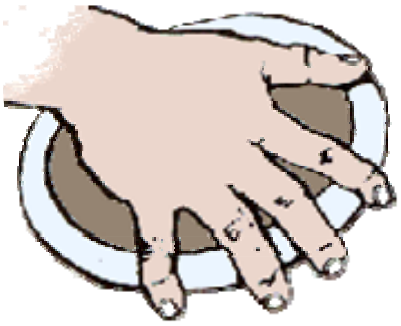
- the athlete uses the same starting position as for the half turn pivot
- pushes off with the right foot and pivots on the left until a whole circle is completed and the original starting position is regained (Fig. 9)

A further progression in both drills is to wind the shoulders and arms back and hold them in that position during the drills.

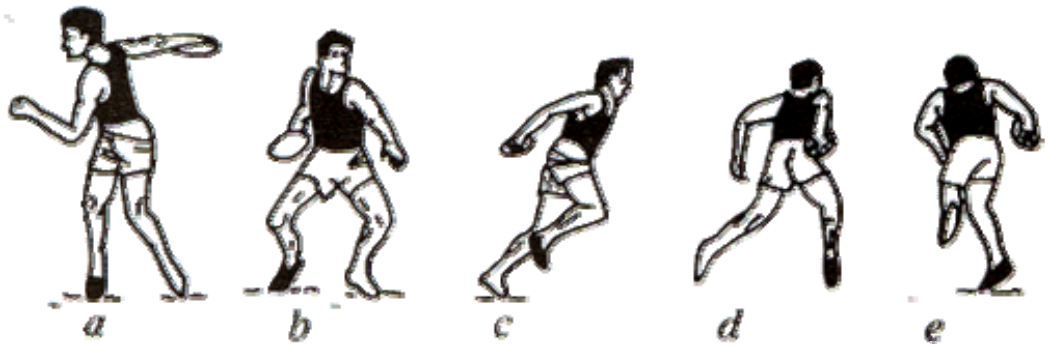
Discus

The hold

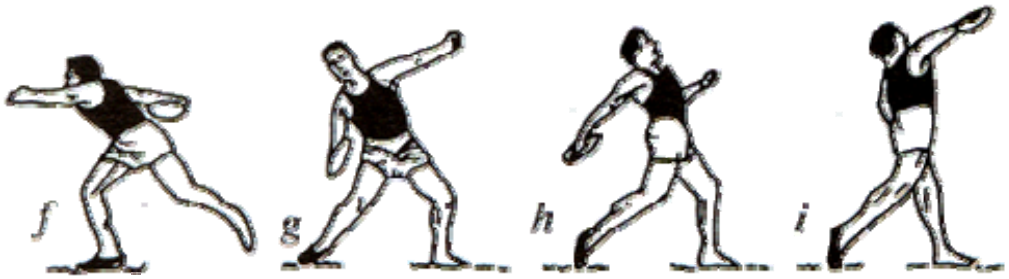
- Place the left hand under the discus for support
- Place the right hand on top of the discus
- Spread the fingers evenly but not stretched
- The first joint of the fingers curling over the rim of the discus.
- Do not to grip the discus
- Allow the discus to rest on the first joint of the fingers with the tips of the fingers over the rim.



Throwing Technique



- Figs a & b
  - Adopt a shoulder width stance and perform preliminary swings
  - Keep everything very long to provide maximum possible radius on the discus
  - Body weight in the middle of the stance
  - Aim for chin over knee over toe on the left leg
- Fig c & d
  - As the right foot leaves the ground the weight must be over the left leg
  - Discus kept high and relaxed, trailing behind the hips
  - Swing the right foot wide of the left foot into the centre of the circle
- Fig e
  - On grounding the right foot pivots on the ball of the foot
  - Keep the left foot low and fast



- Fig f
  - Discus held high and back
  - Keep the shoulders level and balanced
  - As the right foot lands aim for a chin over knee over toe on the right leg
  - Keep the left foot low and fast
- Fig g
  - Real power position is at the moment the left foot makes contact with the ground
  - Left arm points in direction of the throw
  - Right foot pivots
  - Left side of the body is braced
  - Drive the right hip forward
- Fig h
  - Right hip has been driven forward - note the "bow" position
  - The right arm is long and relaxed ready to strike
  - Left side kept firm and braced
- Fig i
  - The right arm comes through fast and last
  - The release angle (angle between the horizontal and the right arm) for the discus has to take into consideration aerodynamic lift and drag. The optimum angle for the discus is about 35 degrees (Bartonietz, 2000).
  - Left foot is kept grounded until well after the discus is released

DISCUS

When discus throwing: -

- Hold the discus flat against your palm; the edge of the discus sits on the pads of the first joints of your fingers; rest your thumb on the back of the discus
- Use a balanced ready-stance; hold the discus up in front of your eyes; your throwing hand on top of the discus; your non-throwing hand underneath for support
- Keep the discus flat and your throwing hand on top while you swing the discus back off your supporting hand in a wide arc
- Swing your feet, hips, chest and shoulders to the front as you move your weight from your back to your front foot
- Stand tall as you swing your arm forward
- Release the discus off your index finger (out of the front of the hand) in a flat spin
- Watch the discus go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DISCUS

Safety

- All throwing and retrieving should be done under a coaches strict supervision.
- The discus should be dry.
- There should not be any throwing back and forth between athletes.
- No-one should stand in the sector when the throw is under way.
- Everyone should stand behind the thrower.
- No-one should ever stand on the right side of a right-hand thrower or the left side of a left-hand thrower.
- The discus must be carried back to the circle. It should not be thrown.
- Throwing should only be allowed in a clearly marked area.

Rules

- During competition each athlete is allowed three throws (and one practice throw if time permits).
- The athlete must commence the throw from a stationary position inside the circle.
- The athlete is allowed to touch the inside vertical face of the iron band or ring (but not the top).

- The discus may be held in one or both hands.
- The athlete may enter the circle from any direction but must leave from the rear half.
- Once an athlete takes up the stance, it is a foul if the discus is dropped.
- No part of the athlete's body may touch the ground outside the throwing circle, including the top of the stop board.
- The discus must land inside the inner lines of the sector.
- The athlete must not leave the circle until the discus has landed.
- Once the discus is thrown the athlete may leave from the rear half of the circle.

Warm Up

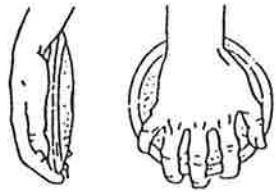
All sessions should commence with a warm up consisting of some short sprints, some stretches and various specific throwing exercises and drills. See the warm up section and the throwing drills section.

Technique

When coaching, each athlete should have a discus to work with. This avoids boredom and long waits between turns. A bean bag may be used as a substitute.

THE HOLD :-

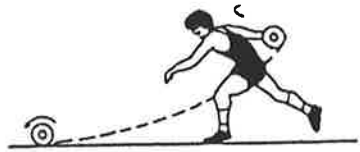
- The discus should be held not gripped. It should rest on the first joints of the fingers with the fingers slightly spread.
- The thumb should be at the back of the discus (not hooked over the edge).
- The throwing arm should hang long and loose (i.e. the wrist must not be cocked).



HOLDING OF THE DISCUS

GETTING USED TO THE DISCUS :-

- Let the athletes get used to the feel of the discus by swinging it around without releasing it.
- Make sure that the athlete has the correct hold.
- Have the athlete bowl the discus along the ground. Make sure that it is released off the index finger last. (Who can roll their discus the furthest in a straight line?)
- The next step is to have the athlete throw the discus vertically into the air letting it spin off the index finger. The throwing arm should be kept long and straight.



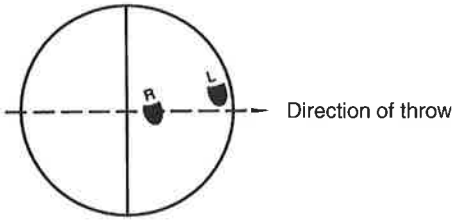
THE SIDEWAYS SLING :-

- Get the athletes to stand sideways to the direction of the throw.
- Stress that the arm holding the discus is to be kept as straight as possible.
- Hold the discus at the front with the right hand and the left hand underneath supporting it.
- Without moving the legs or trunk, swing the right arm back to the rear at shoulder height.
- Swing the right arm forward again and release the discus.
- It should spin clockwise and be released off the index finger.
- The swing should be kept flat.

THE STANDING THROW :- (For Right-Handed Athletes)

- The athlete stands sideways to the intended direction of the throw with the feet approximately shoulder width apart.
- The rear foot is pointing slightly backwards.
- The heel of the rear foot is in line with the toe of the front foot.
- One or two preliminary swings may be made in preparation.
- The body weight is moved back over the rear foot with the knee slightly flexed.
- The chin, knee and toe are in a straight line.
- The right arm is swung back with the hand above the waist.

- The left arm is held high.
- The right foot is turned forward, followed by the knee and then the hips.
- The hips are driven up and forward while the left elbow is driven around and kept high.
- The right arm is pulled through (long arm) and the discus is slung from the index finger.
- 'Watch it Go'. Stand tall with chest high.

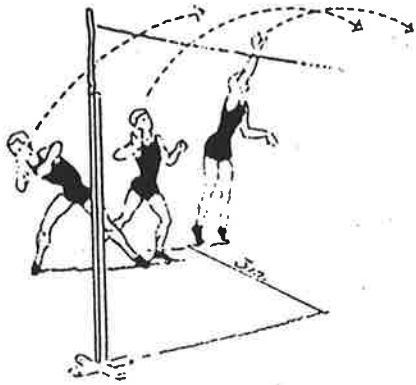



STANDING THROW DRILL

The athlete must be able to completely carry out an effective Standing throw before they experiment with turning throws.

RUNNING - TURNING THROWS :-

- Discus Golf. Place a number of hoops at various distances apart around an oval or large grass area. Nominate a starting position for the players. The object is to see who can throw their discus into the nominated hoops with the least number of turns.
- Wheelbarrow Races.
- Piggyback Races.
- Hopping and Bounding.



The kneeling exercise is for more advanced athletes. The modified version for beginners has them standing.