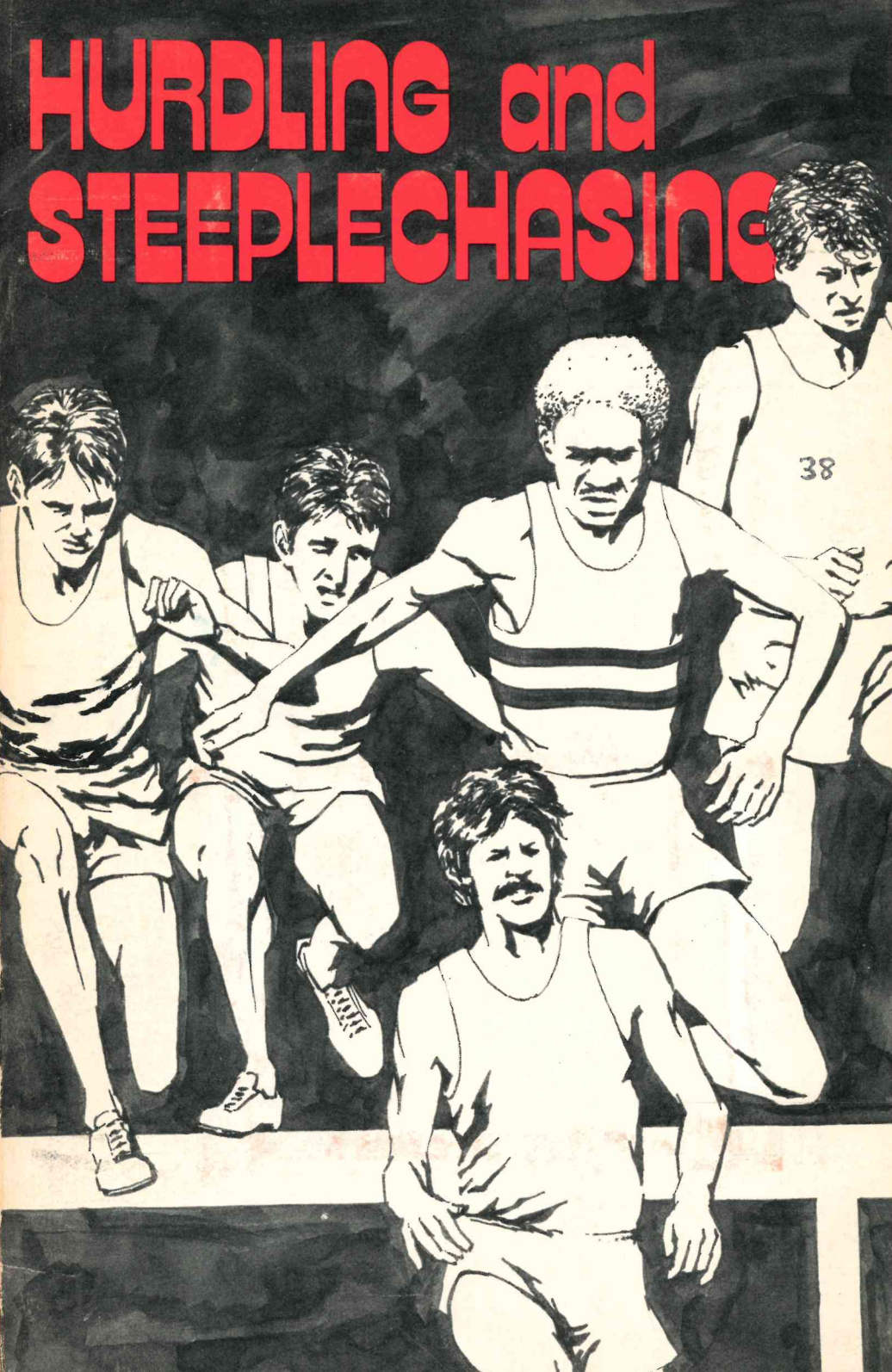
HURDLING and STEEPLECHASING



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HURDLING and STEEPLECHASING

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FOREWORD

Every race has its barriers: times to break, distances to last, human competition to outrun.

Hurdling and steeplechasing are essentially running events. They have all of these elements. All of them and more—as many as 35 more, solid and imposing barriers of 2½ to 3½ feet high, each one waiting to trip up the runner.

Hurdlers need all the speed of a sprinter. Steeplers need all the stamina of a distance runner. This they pick up in training which is not unlike that of flat runners. If they can't run well *between* the barriers, they'll never make it in these events.

But if they can't run well *over* the barriers, these runners will get nowhere. The style of going over is learned in training, too—training of a type no other runner faces. It is more like the preparation a high jumper or javelin thrower goes through. Attention goes to details of step patterns, clearance, etc.

Hurdling and steeplechasing are technical challenges—the most technical in running. They're tough to learn and to execute. This booklet by Vern Gambetta separates these special techniques and emphasizes them. He tells how to learn them, and how to carry them out in training and racing.

As a decathlon man, Gambetta of course has had direct experience with the hurdles. He has had the banged-up knees from hitting hurdles and the skinned hands from tripping over them which every hurdler wears.

Vern also has experienced hurdling from another side. He has taught it on the junior high, high school and college levels—most recently as an assistant coach at Stanford University in California.

His booklet gives particular attention to the beginning steps in these events. He shows coaches how to teach athletes, and athletes how to teach themselves, to *run* the barriers instead of *jumping* them as if they were barnyard fences.

The object is learning to cut down the time spent in the air, since runners move fastest when their feet are on the ground.

A booklet of this type demands good illustrations if it is to make any sense. Toni Nett of Germany, one of the world's most respected track technique authorities, contributes the sequence photography which illustrate Gambetta's text.

After introducing hurdling, Vern examines more closely the ways of training for and racing each of the events: high and intermediate hurdles, women's hurdling and steeplechasing.

The steeplechase chapter is as complete as any which has appeared in an English-language publication. Ironically, the most technical event in distance running has received the least attention in the past.

The skill and complexity of all these events are too little appreciated and are too often perfected only by trial and error. This is largely because so little has been written about running these races. Vern Gambetta's booklet is a long overdue addition to running literature.

—Joe Henderson

Chapter I

Basic Hurdling

Hurdling in high school over low barriers. (John Marconi photo)

WHAT MAKES A HURDLER?

Hurdling is a *sprinting* event. To a beginning hurdler, this may seem an impossibility. The beginner will view the hurdle as a barrier and consider jumping over it. But hurdling is *not* a jumping event. The first lesson in hurdling is that all one needs to clear a hurdle is an elongated running stride, with as little deviation from correct sprint form as possible.

Since hurdling is a sprinting event, a hurdler's most important physical characteristic obviously is speed. To substantiate this, let's examine the time for world records in the hurdles: 13.0 for 120-yards high hurdles, 12.3 for women's 100-meter hurdles and 47.8 for men's 400-meter hurdles. Those are good sprint times even before adding the 1-2 seconds or more spent "in the air," clearing 10 barriers.

Next to speed, the most vital physical attribute of a hurdler is flexibility. A good hurdler must have tremendous "range of motion" in the joints, particularly in the hips, knees and ankles. Also very important and often overlooked is the necessity of flexibility in the lower back and shoulder points. When the average person looks at a proficient hurdler, the first impression is one of suppleness or looseness.

Size is also valuable to hurdlers. Few outstanding male hurdlers have been under 5'8". The average height and weight among male high hurdlers in the 1968 Olympic Games was 6'0", 169 pounds. The only finalist under six feet was Eddie Ottoz, the bronze medalist, at 5'10½". It normally would be possible for a shorter person to be a good hurdler only if he had a high split—long legs.

Coordination and balance are additional key attributes for the hurdler. When sprinting a 42-inch barrier at full speed, a great amount of both is required. These can be improved tremendously through practice of proper technique.

That technique must be learned thoroughly and then practiced regularly. One can learn to hurdle at any age, but I would suggest that the earliest be age 10. This is when the youngster can begin to grasp the concepts of hurdling and attend to the lengthy teaching progressions.

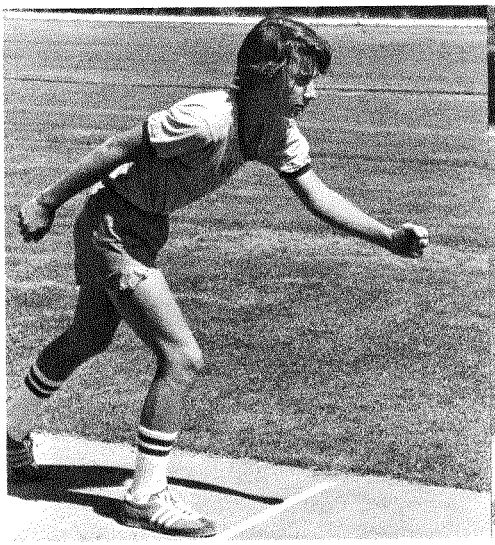
At the start, adjust the height of the hurdle and the distance between hurdles to the individual's stride pattern and height. This will give the beginner confidence and, most importantly, will allow him to sprint rather than artificially adjust the strides to clear the hurdle. Hurdles placed at regulation intervals cause many problems for youngsters. They are forced to run 15 yards to the first hurdle and 10 yards in between. This results in over-stretching the strides, alternating lead legs and jumping. At times, there is little resemblance to sprinting in their action.

In my opinion, age-group hurdle competition should be set up at shortened intervals—for example, 11 or 12 yards to the first hurdle, and 7-9 yards between hurdles—so the race is better adapted to the young runner's stride pattern. If they adjust hurdle placement to their stride pattern at first and then gradually up to regulation spacing, beginning hurdling will be a more positive experience.

LEARNING TO HURDLE

Possibly the best way to learn hurdling is with the "sticks-and-bricks" method developed by Geoff Dyson of Britain, world renowned authority on the mechanics of track and field. I first heard of it at an AAU-sponsored clinic in 1972. Previously, in teaching hurdling to beginners, I had always started them over low hurdles. All the problems of jumping, alternating lead legs, etc., would surface. After being introduced to the sticks-and-bricks method, I realized this was a far better way to lead up to regulation hurdling while maintaining the emphasis on sprinting.

The advantages of sticks-and-bricks are: (1) it emphasizes hurdling as a sprinting event; (2) it can be used with one person or with a group as large as 50; (3) it can be taught in a very short time, and (4) very little equipment is needed—some bricks, shoe boxes or blocks and sticks.



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If you're working with a group, divide the runners into three lines according to the height of the individuals—one line for the shortest people, another for those of medium stature and the third for the tallest ones. People of different heights of course have different stride lengths, and adjustment in "hurdle" spacing are made accordingly.

Now, progress through these steps:

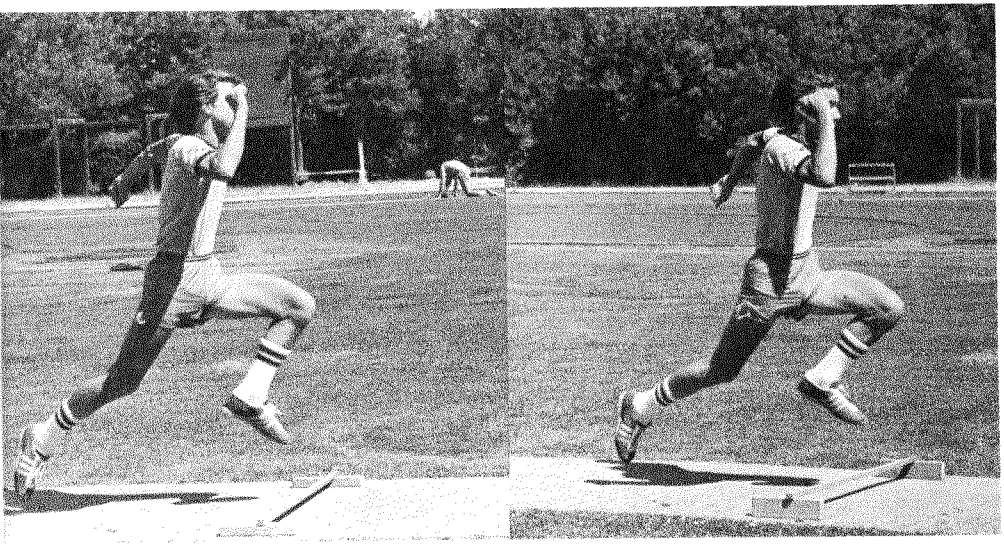
1. **Have each individual sprint 20-25 yards as fast as possible.** Emphasize the need to maintain a constant rhythm.

2. **Teach each individual proper foot positioning at the start.** If the per-

son doesn't find it too uncomfortable, teach him to start with his left leg back and right leg forward. This will result in a left lead leg when hurdling, which is desirable when running intermediate or low hurdles on the turn. Emphasize that he must keep the same foot positioning at the start each time or the stride pattern will change. Using this positioning, have each individual sprint the entire distance once again. (See Photo A.)

3. **Teach the beginners to run eight steps to the first hurdle.** Have each one sprint all-out, counting aloud through 13 steps. His eighth step should be on his right foot. Each individual should do this twice in order to develop a consistent stride pattern. The third time, place a stick midway between the eighth and ninth strides. (See Photo B.)

4. **Have everyone run through again and place a stick on the ground between the 12th and 13th strides.** Emphasize a rhythm as smooth and unbroken as possible. Have them run through again; place another stick between the 16th and 17th strides. (If running more than three hurdles is desired, contin-



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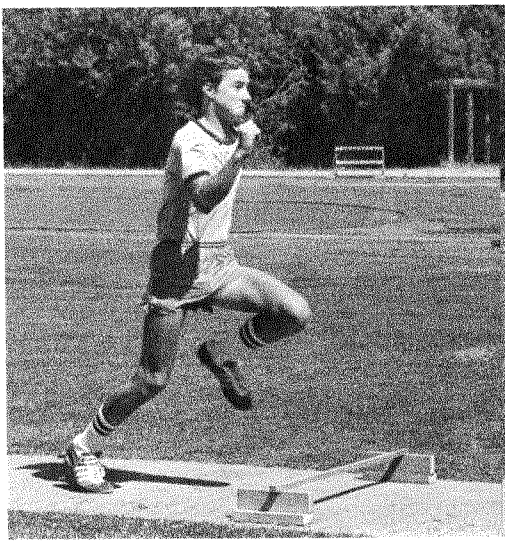
ue this pattern of putting a stick midway between every fourth stride.) The hurdler should not be conscious of the sticks. Constantly emphasize good sprint form: high knee lift, good rear leg push-off and vigorous, relaxed arm action.

5. **Put two bricks flat on the ground for each stick and put the stick on the bricks.** Have each person sprint over these twice. Next, turn the bricks on edge, raising the stick a little higher. Run through twice more. Then raise the bricks up on end and run through them twice. Add the width of another brick to raise the height again, and run through two or three more times.

There should be no mention of the trail leg, lead leg or, for that matter, hurdling until the stick reaches 24 inches in height. (See Photos C-F.)

6. **Point out that normal running action will result in the knee hitting the stick.** Demonstrate trail-leg action: (a) as the lead leg starts downward, the trail leg should start back and up; this will give a split position. (b) As the trail leg comes up, turn the knee and trail leg toes outward. (c) Continue through in normal running action; emphasize the need for a good "first stride" off the hurdle. (d) Emphasize how the arm opposite the lead leg goes forward; it is very important that the arms be vigorously used on landing.

7. **Practice the following lead-leg action a few times without a hurdle:** (a) Stand on the takeoff leg. (b) Swing the leading knee up, flip the leg out and "chop" down. (c) Drive the opposite arm forward at the same time; this lead-arm action is necessary for balance. (d) Cut the trail leg to the side, toes out; the lead hand comes back, outside the trail leg.



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8. **Combine the lead leg and trail leg action.** Walk through the combined action two or three times away from the hurdle.

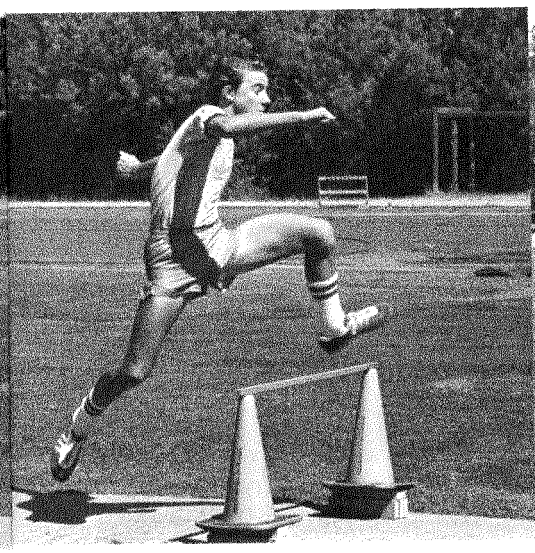
9. **When the stick has reached a height of 24 inches, teach the action of everting (turning out) the toes of the trail leg.** Introduce exaggerated arm action over the hurdle for balance. This is best done by having everyone try the hurdle action on the ground. (See Photo G.)

10. **The athlete should now be ready to run over an actual 30-inch hurdle.** Place the hurdle just where the sticks were, adjusted to the step pattern.

Have each hurdler run through three hurdles about three times. Then place pole vault or high jump standards beside each hurdle and set the crossbar about 18 inches above head height. As the athlete gains confidence over the hurdles, lower the crossbar. This will add him in achieving better "lay-out" position over the hurdle. With increased speed, size and maturity, the athlete can gradually move the hurdles to regulation spacing and still maintain good sprinting action. (See Photo H.)

11. Raise the hurdles about three inches at a time. (This step will take substantially longer than previous ones.) The athlete should avoid training too long over low obstacles. As he gains confidence, he should raise them. Pad the hurdles with foam rubber the first few times the hurdles are at a new height. This will avoid painful bruises and scrapes and will allow the hurdler to be more aggressive.

Remember, this should be a positive experience. Patience is very im-



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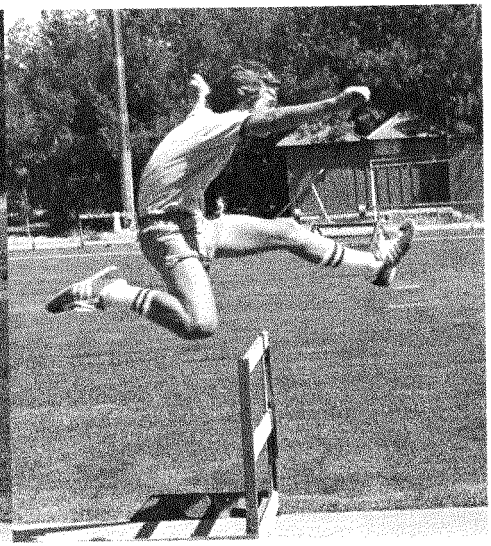

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portant here. The beginner should not move to the next step until he feels confident. Constantly stress sprinting and as slight a deviation from sprinting form as possible. Refrain from timing hurdlers too soon. It is more important that the beginner get a feel for what he is doing before he is timed, although an occasional race with someone of comparable ability could be beneficial.

FLEXIBILITY EXERCISES

Flexibility, like proper hurdling technique, is one of the elements of this event that improves significantly with regular practice. All of the exercises in this section can benefit not only the beginning hurdler but the more experienced one as well. Runners often are restricted by stiffness in the joints which puts limits on their technical advancement. So the hurdler will find that as the range of motion in his joints increases there will be a concurrent improvement in technique.

Do these exercises daily as a part of the warmup before starting hurdle work. A word of caution: before doing these exercises, be sure to jog and do some striding to warm the muscles. This will help prevent injury. Also, in my opinion, these stretching exercises are more beneficial to a muscle that has already been warmed up and can work through a greater range of motion. There is, however, much controversy over this among exercise physiologists.

Another word of caution: never force the exercise to the point of severe pain. Go to the point of pain and stop.

1. **Ground hurdle stretch.** Assume a sitting position on the ground. Lead leg forward and trail out to the side. Have the lead leg flat on the ground, toes pointed up. The trail leg should be flat and bent so that the thigh is at a right angle to the lead leg and the foreleg is pointing towards the back. The toes of the trail leg should be turned out. (See Photo A.)

(a) Bend forward at the waist. Put the chest on the lead-leg thigh and hold for about five seconds. Repeat 5-6 times.

(b) Bend to the side and attempt to put the chest as close to the trail leg thigh as possible. Hold for five seconds. Repeat 5-6 times. (Photo B.)

(c) Seated with the legs apart in a V position, reach out with hands as far forward as possible and hold for 10 seconds. Repeat five times.

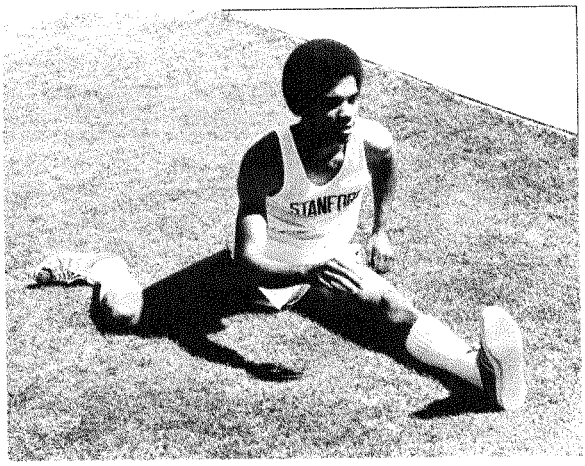
2. **The splits.** This is a good exercise to perform as more flexibility is gained. Put one leg forward and one leg back as far as possible. Try to lower to the ground. Go as low as possible and hold for 5-10 seconds. Repeat two or three times. (See Photo C.)

3. **Stretch on the hurdle.** (a) Place trail leg on the hurdle rail and stand upright, forcing the trail leg hip forward. Bend forward. Grasp ankle of lead leg and put chest on the thigh. Repeat 10 times. (See Photo D.)

(b) Stand facing the hurdle. Place the foot of the lead leg on the hurdle rail. Grasp the rail with both hands, extend the lead leg and put the chest on the thigh. Repeat 10 times.

4. **Stand with trail leg hip about three feet from the side of the hurdle.** Keep the trail leg straight with the toes turned out and circle the hurdle. Repeat 10 times. (See Photo E.)

5. **Stand facing the side of the hurdle about three feet from the hurdle.** Raise the lead leg up and circle the hurdle. Be sure to keep the toes up. Repeat 10 times. (See Photo F.)



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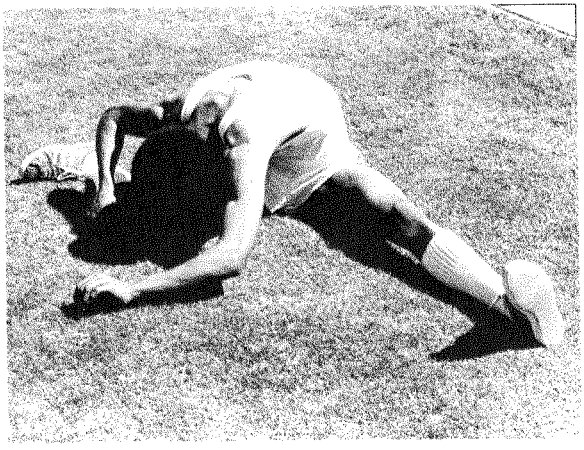

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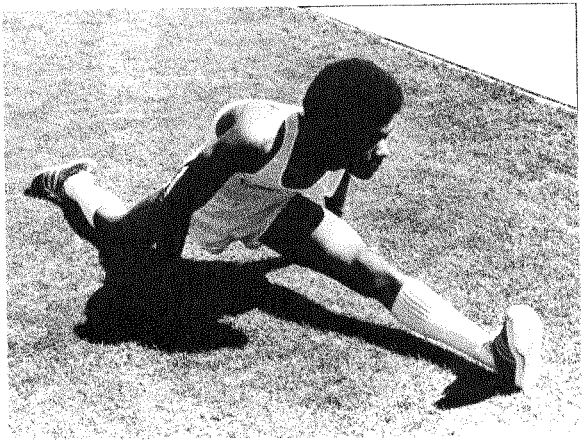

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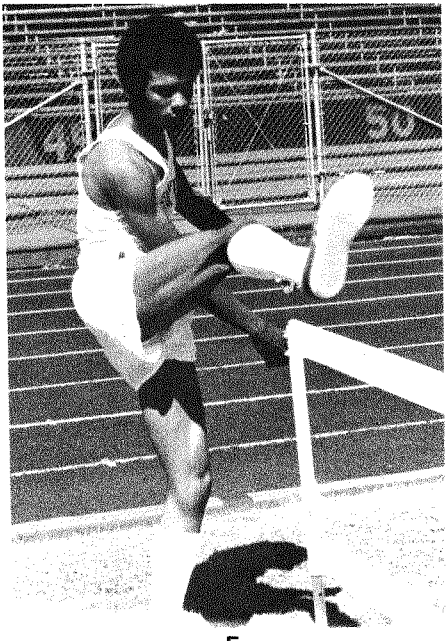

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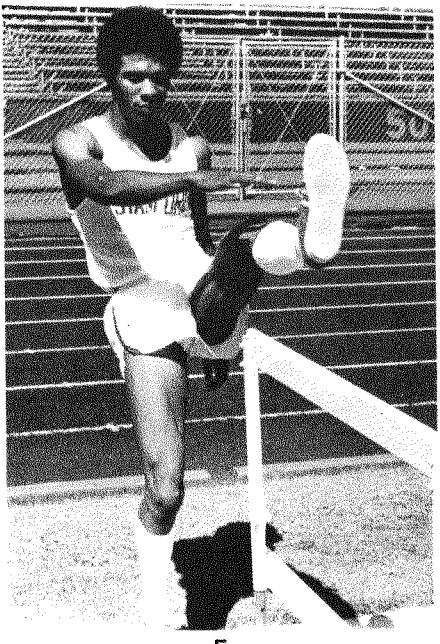

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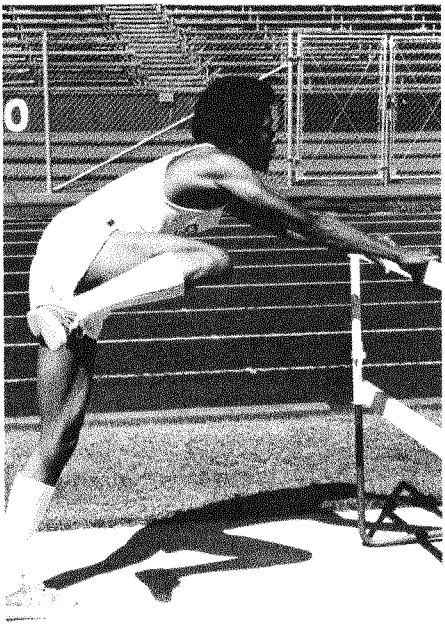

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6. **Ballistic stretch.** (a) Stand facing the hurdle rail. Grasp the rail with both hands. Swing right leg out to the side as high as possible and across the front to the other side as high as possible. Repeat 10 times with each leg. (See Photo G.)

(b) Stand with the left side to the hurdle rail. Grasp the rail with the left hand. Swing the left leg as high as possible in front and as high as possible in back. Repeat 10 times with each leg.

7. **Lead-leg drill.** With chalk, draw a hurdle rail on a wall. Mark an X about three inches above the rail. Stand back two steps. Step forward, raise the lead leg and attempt to hit the X with the heel of the lead foot. Repeat 20 times in quick succession.

8. **Trail-leg drill.** Stand facing the hurdle with the feet back so there is a slight lean. Imitate trail-leg action over the hurdle. Repeat 20 times.

Perform these exercises every day of the week. At first, many of them will be quite difficult. Progress will come quickly and the result will be improved hurdle technique.

Chapter II

High Hurdling

The "high" hurdles for women are 33 inches, and Annelie Ehrhardt of East Germany is the best in the world at running them. She was the 1972 Olympic champion and holds the world record for the 100-meter race. (Mark Shearman photo)

THE HURDLING STYLE

Once the hurdler has mastered the fundamentals presented in chapter one, he should concern himself with refining hurdle technique. Work on each phase of the race.

START

Since hurdling is basically a sprinting event, the mechanics of the start do not vary much from that of the sprint start. Remember that to get eight strides to the first hurdle, the takeoff foot should be placed in the *front* block. If the hurdler wants seven strides to the first hurdle, the takeoff foot should be placed in the *rear* block. (Most hurdlers seem to prefer eight strides unless the individual is very tall and needs to chop his steps to get eight.) Eight strides seem to put the hurdler in a better position into and off of the first hurdle. A run-up of nine or 10 strides leads to a pitter-patter cadence.)

Place the front block 16-18 inches from the starting line and the rear block 16-20 inches behind the front one. Some modification of the position of the block either forward or backward may be necessary, depending on the approach to the first hurdle. If the hurdler is having to jump and feel crowded by the first hurdle, move the blocks back. If he is too far away, move them up. Experiment and find the most efficient, comfortable position.

I think more experimentation should be done using the standing start in the hurdles. It seems to put the hurdler in a better position at the first hurdle than the traditional crouch start because the center of gravity is already raised and the hurdler does not have to straighten up coming out of the blacks. To be truly effective, the beginner would have to start with the standing start and perfect it as he progresses. The main problem with it seems to be remaining still in the "set" position.

FIRST STRIDES

The first three strides out of the blocks are about the same as in a sprinter's start. On the fourth stride, the hurdler begins to concentrate on the first hurdle. This forces him to get up into a normal sprint angle sooner than normal.

In perfecting the approach to the first hurdle, make any adjustments on the fourth, fifth or sixth strides. The first three and the last two should be kept constant. The last stride is slightly shorter to permit the hurdler to get his center of gravity slightly ahead of the takeoff foot. This puts him in a better position to attack the hurdle.

This approach sets the pattern for the entire race. It is as fast as possible so there will be maximum horizontal drive. This drive results in a faster, more efficient hurdle clearance. In competitive situations, a hurdler can put great pressure on his opponents by leading at the first hurdle.

TAKEOFF

The takeoff distance from the hurdle depends on four factors: (1) the height of the athlete; (2) speed of the approach; (3) length of the lead leg,

and (4) speed of the lead-leg action. On the average, the takeoff distance is 6'6" to 7'6" from the hurdle.

Effective takeoff action is necessary to insure sufficient body lean, clearing the hurdle with the least amount of upward movement. The lean or "dip" into the hurdle makes it possible to raise the seat and lower the trunk in realtion to the center of gravity.

The action of the takeoff foot as it leaves the ground is exactly the same as in sprinting. Takeoff should be up on the ball of the foot. Toeing out the takeoff foot, a common fault, results in a loss of drive over the hurdle. It often causes the trail-leg ankle to smash the top of the hurdle.

Good takeoff action, high on the toes, lifts the center of gravity high enough efficient for hurdle clearance. This reduces the time in the air—the object of good hurdle action. Another common fault is to take off flat-footed. This results in lift, which causes the hurdler to clear the hurdle with a jump.

As mentioned, the body's center of gravity is slightly ahead of the takeoff foot. The hip and shoulders should be square to the hurdle. A tendency among beginners is to lean forward with the lead-arm shoulder, which causes imbalance off the hurdle.

The lead-knee action is an exaggerated sprint stride. The hurdler imagines that he is going to drive the knee through the hurdle. Fast lead-leg action causes increased drive off the takeoff leg. The action of the two legs is directly related. The legs, working in opposite directions, have the effect of leaving the takeoff leg behind, causing a split position over the hurdle.

A fault among novices is swinging up a straight lead leg in a goose-step action, similar to punting a football. This requires a greater takeoff distance which, in turn, causes the action to slow down significantly.

According to hurdling expert K. O. Bosen, "Since the speed of the lead-leg action determines the overall speed of hurdle clearance, it is a point to be stressed in training." This is often neglected in the hurdler's technique work. A majority of time is spent developing the trail leg, while little work is done on the lead leg. Sound advice for the young hurdler would be to spend an equal amount of time on drills for each leg.

Many hurdlers have the tendency to swing the lead leg slightly out or in and also toe in or out. This is inefficient. The leg should be directly in front of the hip with the toes pointed straight up.

ACTION IN AIR

The takeoff (trail) leg folds up as a natural reaction to the drive off the ground. The action is essentially the same as when a sprinter's drive leg folds up, the only difference being that the hurdler's trail leg is brought around to the side. As the leg crosses the hurdle, it is bent at the knee with the foreleg against the thigh. The toes of the trail leg are turned out. The action of this leg is continuous, on the move the whole time to prevent a floating or "posed" position in the air.

When viewed from the side, the trail-leg knee crosses the hurdle at the same time as the hip. If the trail leg precedes the hip, the hurdler can correct this by using a more pronounced lift and drive at takeoff. It is wrong to attempt to delay the trail leg in midair.

After clearing the hurdle, the knee is brought through so that just before the lead leg hits, the trail leg knee is under the armpit. This insures a good getaway (first) stride off the hurdle, which puts the hurdler in good sprinting position for the next hurdle. In this first stride, the lead foot comes down 3'9" to 4'6" beyond the hurdle.

The arms work in an exaggerated sprint action. It is important to emphasize the lead arm action, as this balances the lead leg. The hurdler raises the lead arm to about shoulder height and bend it at the elbow. He drives it straight ahead, not across the body. The swing of the trailing arm is very controlled. It swings to the side, but not too far to the rear, off the hurdle. This arm action helps dip the body weight forward and down.

The hurdler leans from the hips with as flat a back as possible. Rounding the shoulders or hunching the back is undesirable. A double-arm action (both arms thrown forward) is not mechanically sound as it deviates too much from normal sprint action. It will get the hurdler lower over the hurdle, with a pronounced dip, but is not effective coming off the hurdle because it can cause severe balance problems. The single arm forward, or what is more commonly termed an "arm-and-a-half" action, is more desirable.

On clearing the hurdle and between hurdles the runner focuses on the rail of the upcoming hurdle. He should avoid snapping the lead leg down, which causes the trunk to rise prematurely. This leg comes down as a result of the pull-through of the trail leg. The faster the trail leg, the faster the lead leg gets back to the ground.

LANDING

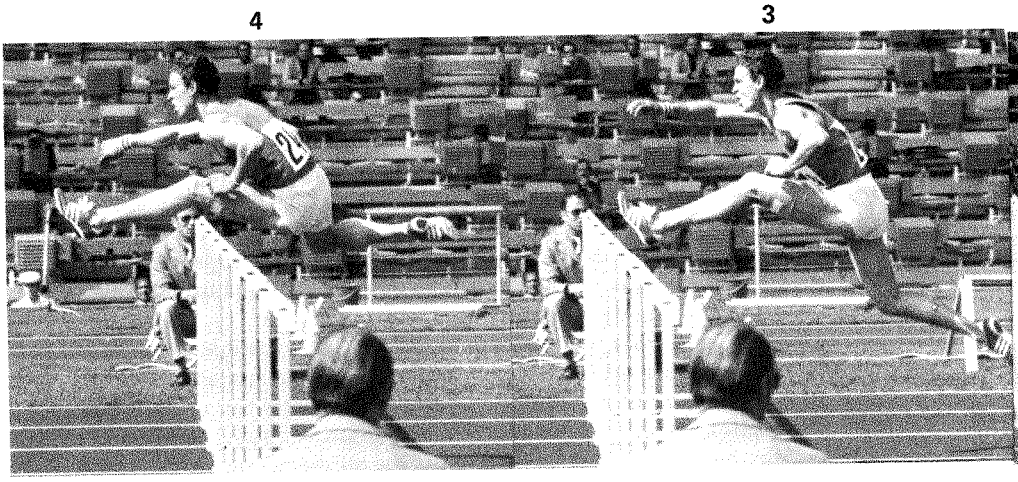
At the landing, the athlete's body weight is directly over or just in front of the lead foot. The landing is on the ball of the foot, not flat-footed. This places him in position for a good getaway stride. It also allows for an immediate pickup in sprint rhythm. The arms come into play as soon and as vigorously as possible off the hurdle.

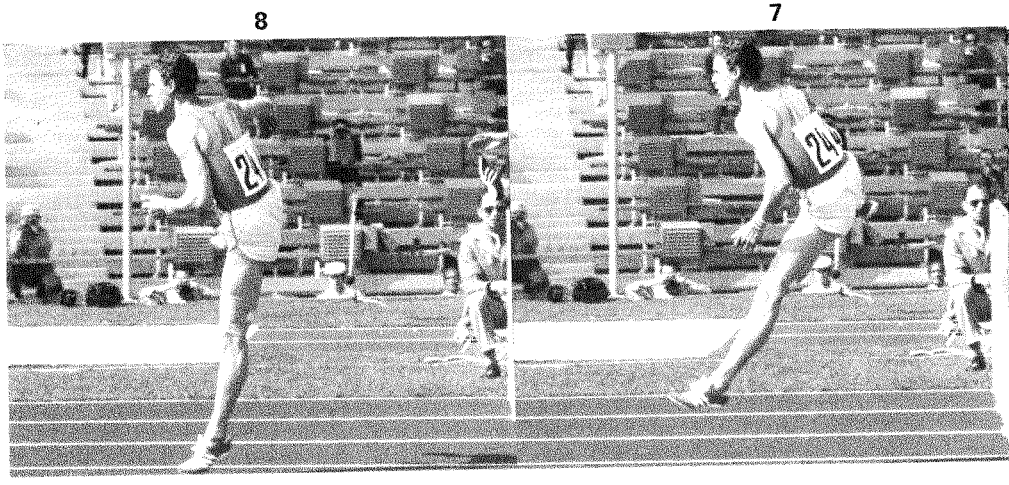
The getaway stride is the result of the high knee action of the trail leg. It is a full, driving stride. A chopped first stride reduces momentum. At times, it is off-center from the other strides. This balance problem causes the hurdler to run an extra distance between each hurdle. Ideally, the lead leg and trail leg land in line with the takeoff point.

The hurdler takes three sprint strides between hurdles. The last stride is slightly shorter than the other two. This raises the center of gravity and places it slightly ahead of the takeoff foot. The hurdler does not stride or bound between hurdles, but drives and maintains a slight lean, staying up on the balls of the feet.

RUN-IN

Hurdle races often are won or lost in the 15-yard run-in after the last hurdle. By this time, most competitors are fatigued. The hurdler who gets back into sprint action soonest has the best chance of winning the race, provided, of course, he is in a position to do that.





Guy Drut

(French silver medalist in the 110-meter hurdles at the 1972 Olympics) Drut leads into the hurdle with his knee (photo 2). His shoulders are square to the hurdle at takeoff. Drut exhibits the single-arm lead action (photo 4). He does not dive into the hurdle nearly as much as Milburn. This erect carriage over the hurdle typifies the European technique of hurdling. Note the trail leg knee (photos 10), which comes through high under the armpit off the hurdle. This will lead to a fast getaway stride.

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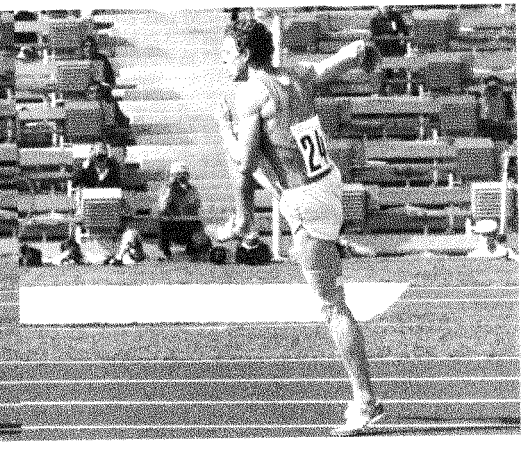

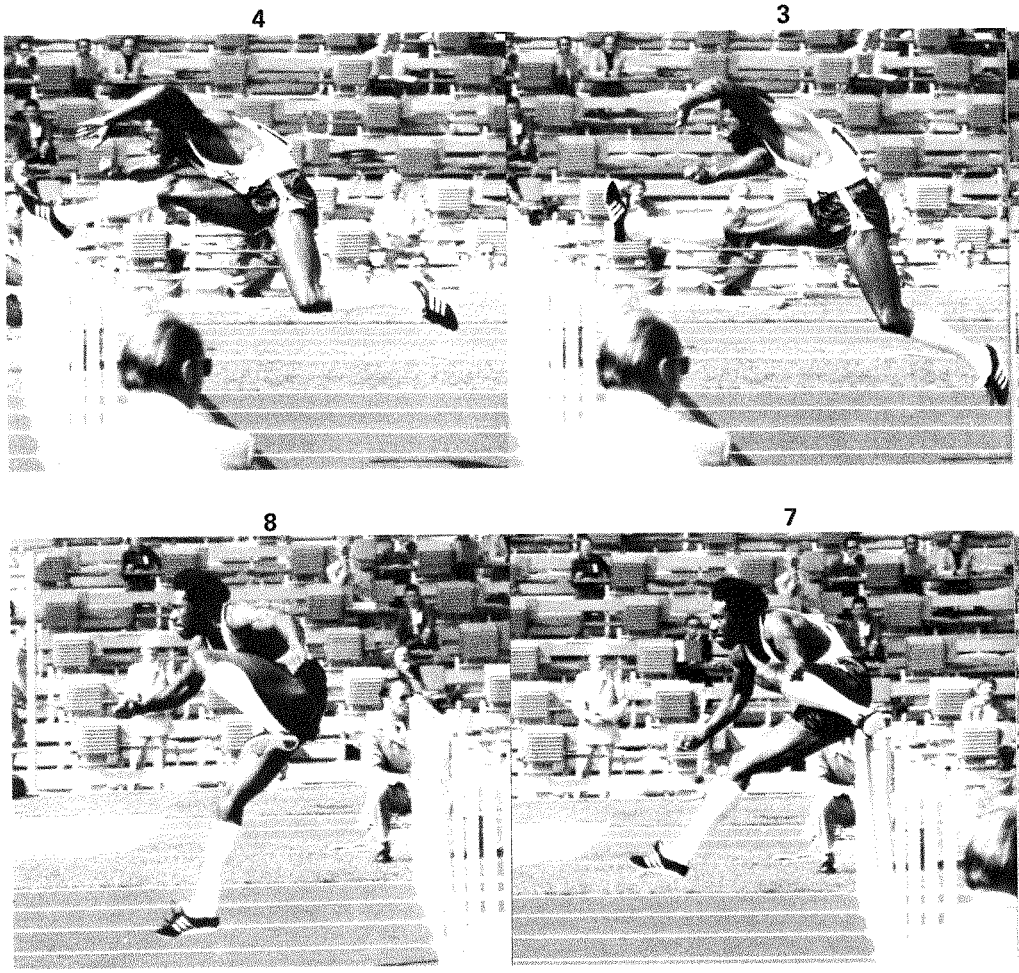

Rod Milburn

(Gold medalist in the 110-meter high hurdles at the 1972 Olympics; world record holder for 110 meters at 13.1 and 120 yards at 13.0) Milburn has a fast flexed lead-leg action (photo 3). Takeoff action is well up on the toes, like a sprinter. Notice his exaggerated double-arm action (photos 2-6). This leads to an extreme dive position (photo 6) with the chest touching the thigh. Especially noteworthy is Milburn's action off the hurdle. He brings the trail leg through quickly and powerfully and returns to sprinting action with no noticeable break in form.

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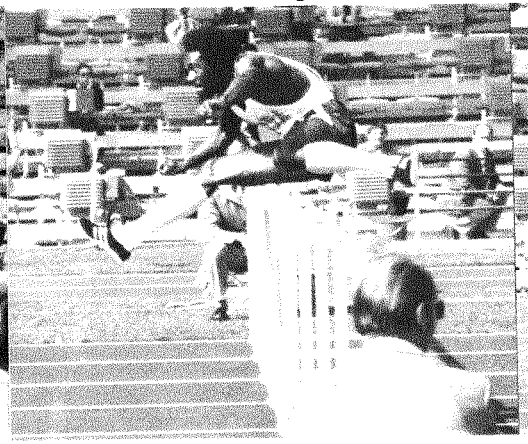

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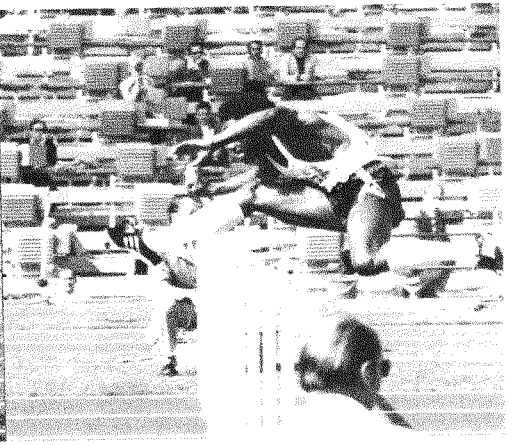

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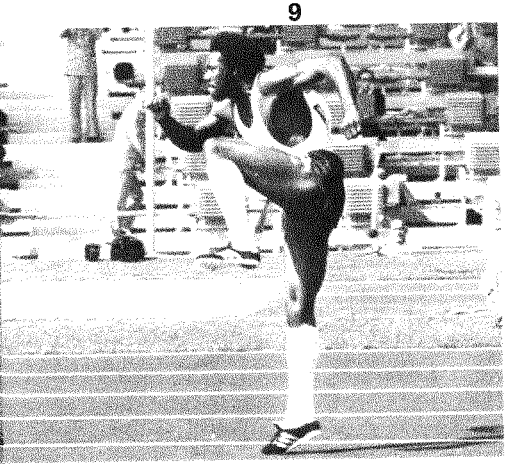

AMERICANS VS. EUROPEANS

Wilbur L. Ross, in his excellent book, *The Hurdler's Bible*, discusses the question of European vs. American technique. There is a slight difference which, although subtle, warrants attention.

Ross feels that the European hurdler remains in a more erect position during the flight phase than does the American hurdler. Ross also states "The European hurdler has a tendency to rotate the hip a little further to the outside of the barrier than the American hurdler, who tends to tuck and bring the knee through directly under the armpit and use a definite step-down thrust into the next running stride..."

Note the sequence pictures of Rod Milburn of the US and Guy Drut of France (first and second in the Munich Olympic 110-meter hurdles), and the differences will be quite evident. I feel it is more a matter of speed. Many good hurdlers get by with defects in technique because of superior speed. American hurdlers have tended to be better sprinters than their European counterparts, and in my opinion this accounts for the subtle differences in technique.

Americans tend to dominate the high hurdles, with Rod Milburn (right) being most dominant in recent years. Milburn, Munich Olympic winner, is the only 13-flat hurdler. (Stan Pantovic)

WOMEN'S 100 METERS

There is very little difference in technique between men's and women's hurdles. In the women's 100-meter hurdles, the stride pattern is the same with seven or eight strides to the first hurdle and three strides between hurdles.

The height of the women's hurdles, 33 inches, does not pose the same problems with raising the center of gravity as does the higher men's hurdles. The hurdle action does not have to be quite as pronounced. Due to the lower height of the hurdles, the action of the lead leg is reduced. The lead leg is never brought to a completely locked or straight positon. This insures that the lead leg gets down quickly and that the return to sprinting action is as fast as possible.

The type of lead-leg action a woman uses depends a great deal on her size. The tall hurdler tends to use a bent lead leg and the shorter hurdler a straight, locked lead leg.

The action of the trail leg is also not so pronounced. Due to the low height of the hurdle, the thigh is brought through at a downward angle. The action of both legs is much closer to normal sprinting action.

Forward lean is not as pronounced because it is not as necessary. Exaggerated body lean would only cause balance problems. This again varies with the size of the hurdler. The short woman hurdler is going to have to use a more accentuated forward lean.

The total clearance stride for women's hurdles is shorter than for men's hurdles. The distance from takeoff to landing is 9'4" to 9'6". The distance from takeoff to the hurdle is 6'0" to 6'6" and from the hurdle to the landing, 3'0" to 3'4".

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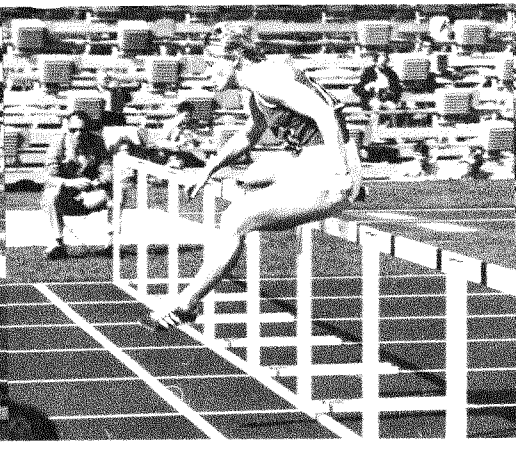

Annelie Ehrhardt

(Gold medalist in the 100-meter hurdles at the 1972 Olympic Games; world record holder at 12.3) She has a good, powerful takeoff with a fast bent lead leg. The arm action is not as pronounced as in the men's hurdles. The clearance (photo 5) is higher than in men's hurdling. The trail-leg thigh comes through at a slight downward angle (photo 6). The trail leg is brought through quickly, but not quite as high as in men's hurdling (photos 7-9). Photo 9 shows a good getaway stride.

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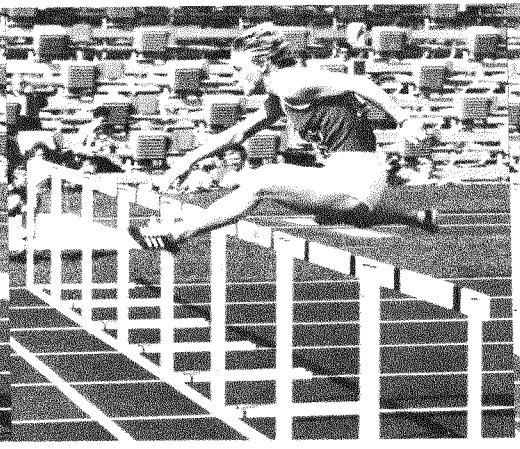

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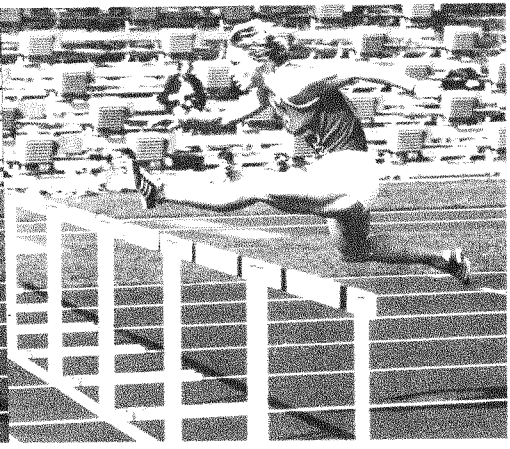

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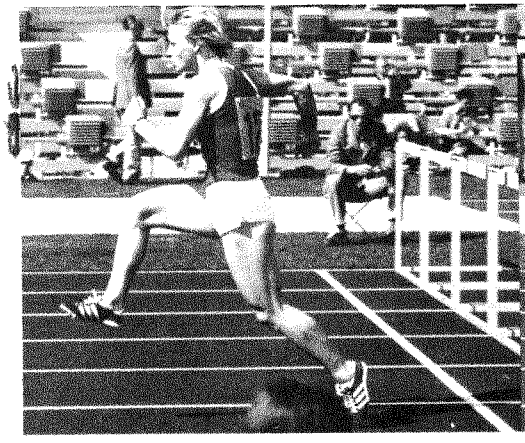

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TRAINING FOR "HIGHS"

In training for hurdles and working on hurdle technique, it is nearly impossible for the hurdler to practice daily over the full 10 hurdles. The solution, then, is to train at full speed over one, three, five, seven, nine hurdles or various combinations.

A good method to insure that the hurdler is working at top speed is to use split timing as a guide to training. Start the watch on the smoke of the gun and stop it when the lead foot hits the ground off a particular hurdle. If the time taken at the third hurdle, for example, was 4.9, it would indicate that the hurdler would run from 14.5 to 15.0 seconds at that pace for the full 10 hurdles. (See accompanying charts.)

Split timing can be taken during a race as well as in practice to pinpoint a weakness in various parts of the race. For example, in the high hurdles, if the athlete's time over the third hurdle was 4.7 and his split was 9.5 at the seventh hurdle, he needs more endurance work.

Another way to predict hurdle times is to take the time at the halfway point and project a final mark. For men, double the 60-yard time and subtract one second. For women, take the time at 55 yards, double it and subtract 0.7. For the less experienced hurdler, less time is to be subtracted. Experimentation will reveal accurate figures for each individual.

HURDLING DRILLS

Many hurdlers do not spend enough time to thoroughly master the techniques of the hurdles. Hurdle drills should be part of each day's workout. Train daily on a specific aspect of hurdle technique, even if only during the warmup period.

1. **Lead-leg drill.** Complete the lead-leg action over the side of the hurdle. Concentrate on leading with the knee and keeping the toes up. Also, do not swing the lead leg to either side. Work over five hurdles about five times.

2. **Trail-leg drill.** Execute a trail-leg action over the side of the hurdle. Concentrate on pulling the trail leg through quickly and emphasize proper arm action. Work over three or five hurdles. A good drill for working on drive into the hurdle.

3. **One-step hurdle drill.** Begin over low hurdles and progress to intermediates. Place 10 hurdles 8-10 feet apart. The object is to go over the hurdle with good technique. The lead foot comes down, one stride is taken, and the hurdler takes off again over the next hurdle. A good drill for working on quickness of the overall hurdle action. This drill can also be done over the side of the hurdle, using either the lead or trail leg. Repeat about 5-8 times in a workout.

4. **Hurdle change-step exercise.** This drill is taken from the book *Hurdling* by John LeMasurier: "Stand close to a low hurdle with the right knee raised: (i) keeping the body upright, hop vertically off the left foot, changing the legs in midair (rather like a scissor action); (ii) direct the left leg over the hurdle and push off the right foot as it comes to the ground (iii), (iv) and (v).

	13.2-13.5	13.5-14.0	14.0-14.5	14.5-15.0	15.0-15.5	15.5-160
Time at landing after						
1st hurdle	2.4	2.4	2.5	2.6	2.6	2.7
2nd hurdle	3.4	3.5	3.6	3.7	3.8	3.9
3rd hurdle	4.4-4.5	4.6	4.7-4.8	4.9	5.0	5.1
4th hurdle	5.4-5.5	5.7	5.8-5.9	6.0	6.2	6.4
5th hurdle	6.4-6.6	6.8	6.9-7.1	7.2	7.4	7.6
6th hurdle	7.4-7.6	7.9	8.0-8.3	8.3	8.6	8.8
7th hurdle	8.5-8.7	9.0	9.1-9.4	9.5	9.8	10.1
8th hurdle	9.6-9.8	10.1	10.2-10.6	10.7	11.0	11.3
9th hurdle	10.7-10.9	11.2	11.3-11.8	11.9	12.3	12.6
10th hurdle	11.8-12.1	12.4	12.5-13.0	13.1	13.6	14.0
Finish line	13.2-13.5	13.5-14.0	14.0-14.5	14.5-15.0	15.0-15.5	15.5-16.0

SPLIT TIME CHART—120y/110m HURDLES

From: "The Hurdle Races" by K. O. Bosen in International Track and Field Coaching Encyclopedia by Fred Wilt and Tom Ecker, Parker Publishing Company, West Nyack, N.Y., 1970.

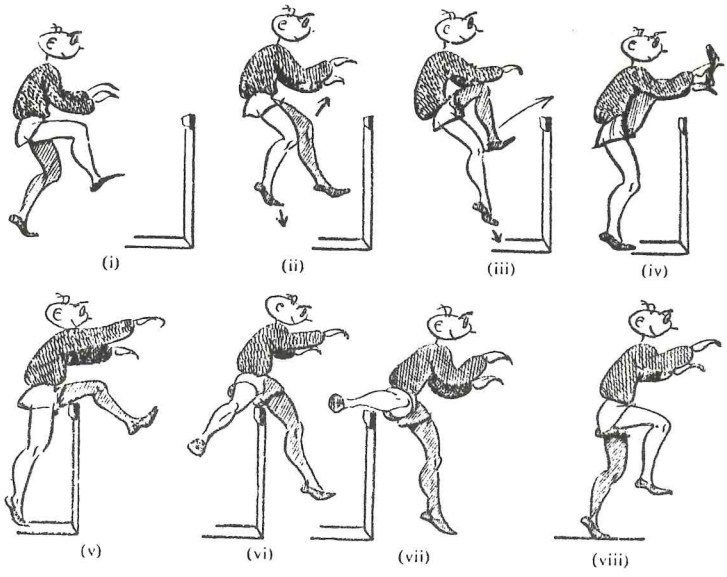
Follow this by rotating the right leg over the hurdle, pulling the right thigh well forward as in normal hurdle clearance (vi-viii). Later, progress by running with a high knee-raising action towards the hurdles and cross them with this change-step action. Use a fast seven-stride high knee action between hurdles. Remember that this is an exercise designed primarily to speed the action of the leading leg, and to assist in the muscular action and mobility of the trailing leg." (See diagram on page 28.)

5. **Five-stride drill.** Place the hurdles 12 or 13 yards apart, depending on the speed of the hurdler. Use five full sprinting strides between hurdles. This enables the hurdler to work on hurdle technique at near maximum speed with a little less effort than is required to three-step. A good drill for endur-

	12.0-12.5	12.5-13.0	13.0-13.5	13.5-14.0	14.0-14.5	14.5-15.0
Time at landing after						
1st hurdle	2.1	2.1	2.2	2.3	2.3	2.3
2nd hurdle	3.1	3.2	3.3	3.3	3.5	3.5
3rd hurdle	4.1	4.2	4.4	4.5	4.7	4.8
4th hurdle	5.1	5.3	5.5	5.6	5.9	6.0
5th hurdle	6.1	6.3	6.6	6.8	7.1	7.3
6th hurdle	7.1	7.4	7.7	7.9	8.3	8.5
7th hurdle	8.1	8.4	8.8	9.1	9.5	9.8
8th hurdle	9.1	9.5	9.9	10.2	10.7	11.0
9th hurdle	10.2	10.6	11.0	11.4	11.9	12.3
10th hurdle	11.3	11.7	12.1-12.2	12.6-12.7	13.1	13.5-13.6
Finish time	12.3	12.8	13.2-13.3	13.7-13.8	14.3	14.8-15.0

SPLIT TIME CHART—WOMEN'S 100-METER HURDLES

From: "The Hurdle Races" by K. O. Bosen, in International Track and Field Coaching Encyclopedia by Fred Wilt and Tom Ecker, Parker Publishing Company, West Nyack, N.Y., 1970.



From "Hurdling" by John LeMasurier (British AAA Booklet)

ance when done over 10 or 12 hurdles. This drill should be confined to fall and early pre-season, since it does tend to change rhythm slightly.

6. **Place hurdles 9-9½ yards apart** so the hurdler can easily take three strides between hurdles. A good drill to work on the proper rhythm between hurdles especially good for anyone who has trouble getting three strides between hurdles.

7. **Five up and back.** Place five hurdles at normal spacing in one direction and five hurdles adjacent in the opposite direction. Using five steps between hurdles, go down and back, making one trip. Begin with 3-5 and try to build up to 10-12 trips. A good drill for hurdle endurance. This drill could be modified for speed-endurance by moving the hurdles 12 yards apart and taking five strides between them. Another variation would be to place the hurdles nine yards apart and take three steps.

8. **Sprint hurdling.** This drill was developed by British coach Fred Housden, advisor to 1968 Olympic champion Dave Hemery. The hurdler must first face the problem of adapting stride length to the distance between hurdles and then increase speed between hurdles without changing the stride length.

In order to increase speed between hurdles, Housden found it advisable to increase the distance between hurdles to seven strides. His rationale was that it allowed two strides to correct a bad landing and left five for sprinting. The drill is set up using hurdles one, three and five. Two and four are removed. Hurdle three is four feet nearer to hurdle one and hurdle five is eight feet closer to hurdle one than normal. For women, the hurdles are moved in six and three feet, respectively.

Other suggested drills: Run the first five hurdles at 42 inches high, the next five to 30 inches. Run the first five high hurdles and next five intermediates (36 inches). Run four hurdles, skip the next two, and run the final four.

The primary concern of the hurdler should be fast *hurdling* in training, not simply sprint training. Too much sprint training on the flat can interfere with the consistency of the stride pattern needed for hurdling.

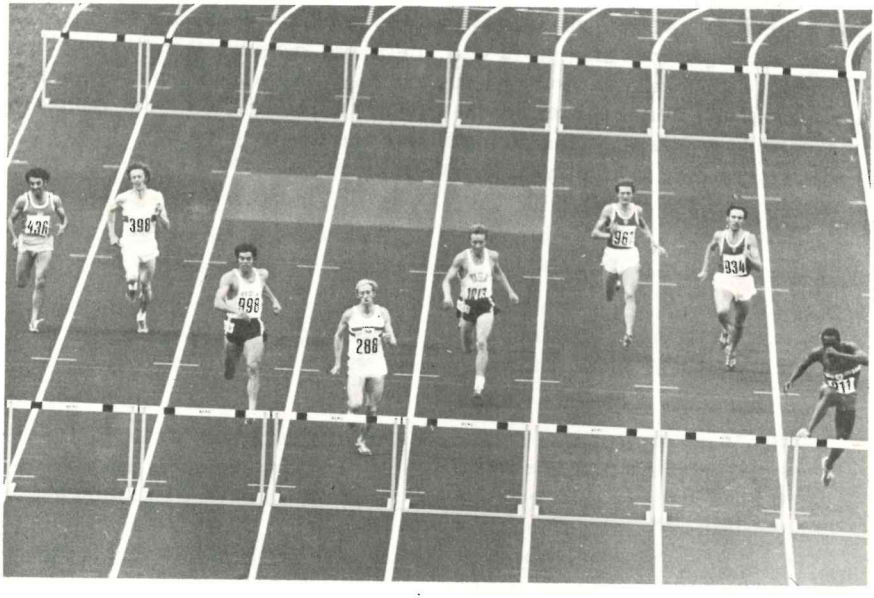
Speed-endurance is an important factor in hurdle training, as form usually begins to deteriorate after the seventh hurdle. This is where races can be won. Many hurdlers make the mistake of training only over three and five hurdles, and lose form and speed in the last part of the race. Train over three, five, six, eight and occasionally 10 hurdles.

Hurdlers should also practice sprint work between two points in a definite number of strides. Occasionally, the hurdler should take starts with an extra stride to the first hurdle in an attempt to increase speed. Gun starts over three and five hurdles should be an integral part of hurdle training.

Training should emphasize the following areas: (1) technique; (2) speed; (3) endurance; (4) strength and (5) flexibility. The emphasis on each of the areas changes with the time of year. In the fall and pre-season, the emphasis is on speed-endurance, strength and flexibility, with some attention to speed and technique. During the season, the emphasis is primarily on speed and technique, while maintaining some strength work and flexiblity training. Keep the training as specific to hurdling as possible at all times.

Chapter III

One-Lap Hurdling



Heading for the wire in the 1972 Olympic 400-meter hurdles, John Akii-Bua (right) leads on his way to a world record of 47.8. Ralph Mann (998), David Hemery (288) and Jim Seymour (1013) took the next three places in that order. (Mark Shearman photo)

LOWER AND LONGER

The intermediate hurdles is one of the most physically demanding events in track and field. It requires the speed of a quarter-miler, the stamina of a half-miler, and the suppleness and technique of the high hurdler. From a technical point of view, the greatest problem facing an intermediate hurdler is deciding the number of strides to take between hurdles and then to master the chosen stride pattern.

Another complication in the intermediates is the fact that the race is run around two curves. It is preferable for the hurdler to lead with the left leg. This permits him to run on the inside of the lane, making the curves easier to negotiate.

The beginner who does not have a preferred lead leg should learn to lead with the left. It is also advisable that he learn to hurdle off the "wrong" foot. This will prepare him for all eventualities. Should the step be off, he will be able to clear the hurdle without losing form. In addition, alternating legs can be used effectively to make a transition in stride pattern.

APPROACH TO FIRST HURDLE

Choose a number of strides to the first hurdle which feels comfortable and which results in a good transition to striding between hurdles. Twenty-two strides is recommended because it closely resembles the stride rhythm that the hurdler takes between hurdles. In the case of 22 steps, place the lead leg in the rear block. For 23, place the lead leg in the front block. Twenty-one, 23 or 24 strides may be acceptable, depending on the individual.

The speed to the first hurdle is slightly less and is more controlled than in the flat 440. The last four to five strides before takeoff are as close as possible to the same stride rhythm to be used between hurdles. The beginning hurdler could benefit by counting the number of strides to the first hurdle to help insure proper step pattern. Count each time the takeoff foot hits the ground. For 22 steps, the takeoff foot will hit 11 times. For 23 steps, the takeoff foot will hit 12 times.

To develop confidence in this run-up, practice to an imaginary first hurdle or place a stick on the ground where it would be. Run through enough times to develop consistency and confidence, then put the hurdle up in the lane.

HURDLE FORM

Form in the intermediates is a compromise between high and low hurdle technique. Many coaches and athletes feel that hurdle form is not as important in the intermediates. This is a serious misconception. Good form allows the hurdler to flow over the hurdler with only a slight deviation from normal running form.

The action is similar to that of the high hurdler except there is less of a "dive" into the hurdle, and less flexibility in the hip is required because of the lower hurdle height. The running action over the hurdles is less pronounced. This allows for an economy of effort and as little disturbance of the stride pattern as possible. The action with the lead arm is similar to that of the high

hurdler, but again not nearly as pronounced. In the intermediates, the hurdler should carry the arms lower to the sides. The lead-arm action should be parallel to the leading leg.

Continuity of action is as important here as in the high hurdles, even more so due to the added factor of fatigue. Willard Hirschi, Ralph Mann's coach at Brigham Young University, describes the hurdle action:

"As the athlete approaches the hurdle, (he) should lean into the hurdle—no elevation of the head, little or no elevation of the crotch, depending on the hurdler's leg length. His lead leg should come up in a regular running stride and he should lead with the knee. The arm action should be as close to that of sprinting as possible, the right arm not extended. He should reach with the elbows with the forearm lying across in front of the body."

Technique for the intermediate hurdler does not receive enough attention. By correcting faults and perfecting his technique, the hurdler can complete a race with much less effort. Remember that fatigue will magnify faults in technique. Keep the shoulders and hips square to the hurdles at all times. Many hurdlers twist their upper bodies over the hurdle, which causes them to land off balance. It then takes them a stride or two to get back to normal running action.

In order to master action over the hurdle around a curve, practice hurdling in all lanes, not only the one that is most comfortable. Training on the bend is even more vital to the right-lead-leg hurdler who has a greater tendency to trail a foot around a hurdle.

The length of the flight over the hurdle is approximately 7'0" to 7'6" in front and 4'0" to 4'6" beyond that hurdle. To avoid disturbing the stride pattern, do not attempt to chop down the lead leg.

STRIDES BETWEEN HURDLES

In oder to excel in the intermediates, develop a stride pattern that fits perfectly into the space between hurdles. This will vary with individuals but should not include any chopping or overstriding. For most athletes, the best stride pattern between hurdles is 15 steps. For the beginner, 17 may be necessary at first. But, this is not practical for too long because it will lead to chopping the strides. A good rule of thumb to remember concerning strides is to use as few strides as possible without overstriding.

It would be best to maintain the same stride pattern for the whole race. Many athletes have used 15 or even 13 all the way, although the former can lead to chopping and the latter to overstriding. A possible solution to the problem of strides between hurdles would be to take 14 or 16, but these would necessitate the added skill of alternating takeoff legs. Due to fatigue, most athletes have to change their stride pattern to a greater number of strides during the race. Usually this changeover takes place after the fifth, sixth or seventh hurdle. It involves a great deal of practice to change without a serious loss in momentum or hurdle form.

How many strides should a hurdler take between hurdles? The answer lies in the hurdler's natural stride length. The following are common stride patterns and the required length of stride for each: 17 strides—6'1"; 16 strides—6'6"; 15 strides—7'0"; 14 strides—7'7"; 13 strides—8'0".

To reach 13 steps requires an eight-foot stride which can quickly fatigue the normal athlete. This can cause serious trouble if carried too far into the

race. The more experienced hurdlers usually go 13 for five or six hurdles and then change to 15. The changeover shifts in rhythm from a longer stride to a quicker cadence. This does not mean chopping. To facilitate the change, some hurdlers find it beneficial to run on the outside of the lane. This has the effect of adding a little distance and thus, extra steps. This does pose a problem of trailing the foot around the hurdle. Fatigue should also aid the changeover, as it will force the hurdler to change to an increased number of strides.

Hurdling on different track surfaces can change the stride pattern immensely. In his warmup, the hurdler should assess the condition of the track and choose his stride pattern accordingly. Tartan and similar surfaces will facilitate a fewer number of strides. The hurdler should also take into account the wind and other weather conditions.

Relaxation and concentration are very important in the intermediate hurdles. The hurdler must stay as relaxed as possible in order to maintain form. Concentration on one's own race plan is of utmost importance. If an opponent inside or outside goes out faster than expected, the hurdler should not panic but have confidence in his own race plan.

RUN-IN

Anticipate the run-in by clearing the last hurdle as relaxed and with as good a form as possible. After clearing the last hurdle, think the same as a quarter-miler finishing the race. Concentrate on pulling with the arms and quickening the leg speed. This is the point where the speed-endurance of the athlete is most evident.

ONE-LAP HURDLES FOR WOMEN

The women began racing the 400-meter hurdles in 1973. A year later, the record for the event was 56.7 by Danuta Piecyk of Poland. Most of the women who have run the event have 400- or 800-meter rather than hurdling backgrounds.

The women's race is similar to the men's. Intermediate hurdle spacing is the same except that the hurdles are 30-inches high. The stride pattern is 22 or 23 strides to the first hurdle. Usually 17 strides are taken between hurdles up to the fifth or sixth hurdle, with a changeover to 19 strides after this point.

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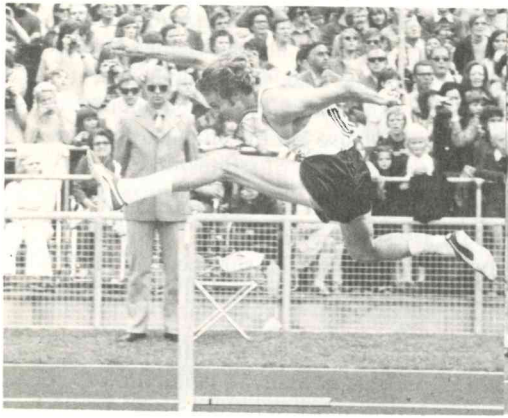

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Jim Seymour

(Fourth-place finisher in the 400-meter hurdles at the 1972 Olympic Games, from the United States; best time 48.64) The general overall action of the intermediates is not as exaggerated as in the high hurdles, due to the lower height of the hurdles. This sequence illustrates the difference. The lead-leg action is not as pronounced and arms are carried lower. The trail leg does not lay out as much as in the highs. The trail leg is not brought quite as high off the hurdle.

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"INTERMEDIATE" DRILLS

Split timings as a guide for training can be used effectively in the intermediates as in the highs. Split timing can determine proper pace at any hurdle and the point in the hurdle race where problems begin to occur. To determine splits, take the time at the landing of the lead foot off the hurdle. Check this time with the accompanying chart to derive the final time.

Pace judgment in the intermediates is of prime importance. Normally, the first half of the race is run two seconds faster than the second half of the race. To determine this pace, take the split time at the fifth hurdle and add 1.8 to two seconds. This will give the 220-yard time, as the fifth hurdle is short of a 220.

Basically, the conditioning for the intermediate hurdler is the same as the training for the quarter-mile. Each hurdler should be capable of running a fast 600 yards. This race is similar in terms of energy cost to the athlete. Fall and early season training should be directed towards running a good 600.

It is my opinion that at least half of the intermediate hurdler's repeats should be run over hurdles to work on pace judgment and economy of effort. In the fall, when running repeat 550s, 440s, 330s or 220s, it is beneficial to put two or three hurdles arbitrarily somewhere in the distance. During this time, the hurdler should not be concerned with stride pattern but with adjusting to an upcoming hurdle, clearing it with good form and coming off the hurdle with good sprint action.

The intermediate hurdler should run his drills over hurdles out of the blocks. Typical workouts are running over three, five and seven hurdles.

In order to work on "*transition*" (changing the number of strides between hurdles), begin at the third hurdle and run the prescribed number of strides (13 or 15) between the fourth and fifth hurdles. Then chop down to

	48.0	49-50	50-51	52.0	53.0	54.0
Time at landing after						
1st hurdle	5.7	5.9	6.0	6.1	6.3	6.4
2nd hurdle	9.7	10.0	10.2	10.4	10.7	10.9
3rd hurdle	13.7	14.1	14.4	14.7	15.1	15.4
4th hurdle	17.7	18.2	18.6	19.0	19.5	19.9
5th hurdle	21.7	22.3	22.8	23.3	23.9	24.4
6th hurdle	25.8	26.5	27.1	27.7	28.4	29.0
7th hurdle	29.9	30.8	31.5	32.2	32.9	33.7
8th hurdle	34.2	35.2	35.9	36.8	37.6	38.5
9th hurdle	38.5	39.7	40.4	41.6	42.5	43.4
10th hurdle	43.0	44.3	45.1	46.5	47.5	48.4
Total time	48.0	49.6	50.5	52.0	53.0	54.0

SPLIT TIME CHART—400M/400Y HURDLES

From: "The Hurdle Races" by K. O. Bosen, in International Track and Field Coaching Encyclopedia by Fred Wilt and Tom Ecker, Parker Publishing Company, West Nyack, N.Y., 1970.

15 or 17 steps and run over the sixth and seventh hurdles to complete the transition to the new rhythm. Repeat five or six times in a workout.

Another good intermediate drill is to run the *first 220 on the flat and the last 220 over hurdles.* This serves as a good indicator of potential time.

A valuable workout in the fall or early season is the *up-and-back drill* on grass. On opposite sides of a football field, place two hurdles facing one way and two hurdles facing the other way. Place both sets the proper distance apart. Attempt to run them in 15 or 17 strides, jog across the field and repeat the same going back. Up and back counts as one trip. Begin with six trips and progress up to 10. This can also be done on the track. It is a good drill for step pattern and endurance.

BYU coach Willard Hirschi suggests the following to simulate the conditions the hurdler will face the *last three or four hurdles* of a race:

"The best way to simulate this condition is at the end of 440, 550 or 660 runs where the hurdler goes over one or two additional hurdles at the conclusion of these runs. Three things are achieved by this: (1) the hurdler learns to adjust his steps quickly; (2) he learns to hurdle when fatigued and it is a regular part of practice; (3) there are only one to three hurdles and he can concentrate on relaxation rather than worrying about hurdles all the way around the track."

Another drill, the *12-hurdle exercise*, is basically a strength workout. Place the 11th hurdle five meters from the finish line and the 12th 30 meters (33 yards) beyond the line. Don't use this drill too often, especially within a week of a race.

Chapter IV

Steeplechasing

Kip Keino (576), hardly an accomplished steeple technician, won the Olympic title with his superior speed. (Horst Muller)

PLASTIC CROSS-COUNTRY

The steeplechase, a hurdling event for distance runners, has been characterized by steeplechaser Mike Manley as "plasticized cross-country." The event had its origins in races over fallen logs, hedges and water-filled ditches that today are found in international cross-country competition.

The standard steeplechase distance is 3000 meters. There are 28 hurdles and and seven water jumps in the race, four hurdles and a water jump for each of the seven laps.

Unlike the other hurdle races, this is an event where the United States has experienced little international success, with the notable exceptions of Horace Ashenfelter and George Young. The steeplechase has been an event dominated since its inception by the Europeans and, in the past few years, the Africans. For the Americans, it has traditionally been an event for the runner who could not quite make it in the mile, two-mile or three-mile. In Europe and Africa, top flat runners have been more willing to try the steeple.

Perhaps another reason for Europeans and African success relates to the type of cross-country running they do. In Europe, courses require the skill of negotiating barriers and water-filled ditches. This is good training for the steeplechase and allows for an easier transition to the event.

In running the event, the Europeans and Africans have been more aggressive. They are willing to force the pace from the beginning of the race and not sit back and kick, as many Americans have done.

For American runners to become more competitive internationally in the steeplechase, I feel the overall approach to the event should be changed. Some cross-country courses should prepare runners for steeplechasing. More and better runners should be encouraged to run the event and run it hard. Also, this event *should* be included more often on the high school level—perhaps as a 1500-meter steeple in a big invitational. This would quickly build up a tremendous base of talent. Ten years ago, the United States was a weak sister in distance running, but with the two-mile being run in high school and longer distances in cross-country, US distance fortunes have improved. The same could be true for the steeplechase.

Barry Brown, a top American steeplechaser, offers further opinions on how the steeplechase could be improved in the US:

"The steeple is probably the only running event that does not have a refined and specialized training program. For the AAU runner, there are very few opportunities to run the event under favorable conditions. Most meet directors treat the steeple as a second-class event, and it hurts the 8:45-8:55 who could improve drastically if given a chance.

"Probably three-quarters of the courses in the US are not conducive to fast times. You either jump the curb approaching the water and leaving the water, or you have to run across a soft grass approach to the jump, or up a slight incline, or in some cases you have to do all three..."

TYPES OF STEEPLECHASERS

Steeplechasers come in three basic types: (1) superior flat runners; (2)

steeplechase technicians, and (3) cross-country types. The superior flat runners possess exceptional speed over the mile, two-mile and 3000 meters and also runs the steeple. They seldom, if ever, practice over barriers and rely on their speed. Two recent examples of the "speed" type are Kerry O'Brien, former world record holder at 8:22.0 who never practiced over barriers but possessed 8:19 two-mile speed, and Kip Keino, who ran the Olympic steeple only as an afterthought and emerged with the gold medal. Keino could run the 3000m in 7:39.5 and the mile in 3:53.1. His technique could be described as crude.

The second type is the "steeplechase technician." This runner possesses the qualities of a good flat runner and has good technique over the barriers. There is very little differential between this type of runner's flat times and his steeplechase times. A good example is Ben Jipcho. He has run 8:16.4 for two miles, 7:44.4 for 3000 meters and holds the world record in the steeplechase at 8:14.0.

The third type, the "cross-country runner," is accustomed to the broken pace demanded by the uneven terrain in cross-country and possesses the type of strength necessary for the steeple. For this runner, it is comparatively simple to make the transition to the steeple. Tapio Kantanen and Gaston Roelants are this type of steeplechaser.

STEEPLE TECHNIQUES

British Olympic coach Denis Watts offers these reasons why the steeplechaser should develop good action over the barriers:

"Bad clearances use up energy which the runner will require during the latter stages of the race. They also mean poor landings and the effort of picking up speed again on the far side of the hurdle. A competitor cannot afford to make a mistake because the hurdles are big and heavy and cause injury if they are struck. The jostling of other competitors makes hurdling difficult—and sometimes dangerous—as the runners begin to tire. Apart from the fact that good hurdling means less time is wasted in taking the barriers, it also means that the hurdler is less likely to run into trouble during the race."

Technically, the action of clearing the steeplechase barrier is similar to that used by the intermediate hurdler. The hurdling action is not as exaggerated or as sharp an action as in the intermediates. The arm action is less pronounced. There is very little "layout" and slightly more of a jumping action over the barrier. Due to fatigue, no definite stride pattern is possible, so this does not enter into the skill of the event.

The actual form of the trail leg and foot is immaterial in the steeplechase although the trail leg should be pulled through as quickly as possible. Tucking the leg under is acceptable as long as it is relaxed and results in landing on the other side with little loss of speed. It is important that the hurdler try to land with with shoulders and hips as square to the track as possible. Any deviation will cause him to weave for two or three strides. This occurrence at each hurdle for seven laps could account for a tremendous waste of energy and time.

STEPPING VS. HURDLING

There are two schools of thought in the steeplechase on how to clear the barriers. One school feels it is best to hurdle the barrier with as good a form as possible. The other feels it is just as efficient to step up on each barrier. Geoffrey Dyson, in *Mechanics of Athletics*, states:

"It must be emphasized that the proper hurdling of the 28 three-foot hurdles is more efficient than clearances where the leading foot is placed on top of the hurdles. This latter method may be necessary for those who cannot hurdle but, since the athlete must raise his center of gravity much too high and interrupt his running action, it is uneconomical and it is slower, as is very obvious when a hurdler and stepper clear the last three or four hurdles in a close race. The would-be specialist steeplechaser should therefore master hurdling techniques."

Most outstanding steeplechasers have been "hurdlers" rather than "steppers." The most notable exception was Kerry O'Brien, who stepped on each barrier. He did this because he felt it was more comfortable for the bulk of the race. He did say, however, that it could be a disadvantage in a tight finish. But he also felt that it gave him an advantage in a tight field because he was less likely to be pushed off balance and he was able to take off on either foot. O'Brien, incidentally, trained exclusively on the flat. He never went over barriers except in meets!

Jim Dare, AAU champion in 1972, says that when his left leg comes up, he hurdles; when the right leg comes up, he steps. He thinks that although stepping takes a little more effort, he does not have to chop or adjust his stride to make the step come up correctly. Most steeplechasers would agree that the choice between hurdling and stepping comes down to doing what is most natural and relaxed, as long as it gives the individual some degree of efficiency.

If the steeplechaser does desire to hurdle, he should learn to hurdle off either foot. This will cut down on the adjustment he will have to make for each hurdle. (However, both Dare and Joe Lucas, 1972 NCAA champion, say that alternating lead legs is not too beneficial and that the situation where it is necessary is rare.)

If the athlete has a preferred leg, he must develop an eye for distance in order to adjust for each hurdle. He must shorten or lengthen the stride 20 yards before the barrier to insure proper clearance with as little deceleration as possible. Some beginners have found in their initial training that using a checkmark 15-20 yards before the barrier can be helpful. However, checkmarks should be discarded quickly, as it is more important to learn how to "eye" the distance to the hurdle.

Many steeplechasers appear to speed up slightly as they approach the hurdle. This acceleration insures a continuous action over the barrier and prevents slowing down on the other side. Possibly the most serious mistake a steeplechaser can make is to slow down just before he approaches a barrier.

WATER-JUMP TECHNIQUE

Geoffrey Dyson explains the technique of water jump:

"In taking the water jump, the skilled performer speeds up several strides before takeoff and gauges this spot without chopping or changing stride. For it is essential to accelerate beyond average racing speed in order to negotiate this wide (12 feet) obstacle.

"He then springs on to the rail, meeting it just above the hollow of the front foot. Now, by maintaining a crouch position over a bent leg, he reduces the body's movement of inertia about the supporting foot, thus pivoting quickly and easily forward. The leg thrust (primarily horizontal) is powerful yet smoothly coordinated. The trunk straightens, the rear leg is kept trailing momentarily and the arms are raised laterally for balance correction. The landing (about two feet from the water's edge) is made on one foot and the first stride is taken onto dry land.

"Experience proves that although in the early laps it is possible to clear the water in one leap from the rail, in terms of energy expenditure this becomes increasingly costly as the race proceeds. It is therefore more economical to negotiate the obstacle in the manner described, and to do this throughout the race."

Remember that in the spring-off, the crossbar should be as forward on the foot as possible. This allows quicker return to running action. Try to land on the crossbar so that the foot is just over the front side. This will facilitate the spring forward.

The landing off the water jump is on one foot. The other foot continues forward in a step out of the water, which is as normal a stride as possible. Some steeplechasers have expressed the step out of the water as a feeling of almost falling out of the water.

Momentum is very important in the water jump. Keep the arms and legs moving, with the weight well forward and the body low and tucked. Straighten up on top of the barrier but remember to push off forward. A small but significant detail is to use the strong leg to step up on the barrier and push off. It might be a good idea to mark the step in the water jump since this is a crucial area. Early in the race, the checkmark should be farther back; later in the race, closer to the barrier.

BEGINNING STEEPLECHASING

Jim Dare calls the steeplechase a strength event. He suggests that before undertaking the steeple, the beginner should have a strong running background in order to become accustomed to the intense type of running necessary in the steeplechase. With the running background, the steeplechaser must master hurdle and water jump clearance, and pace judgment. Technique work on these aspects make up a large portion of the training.

Understanding hurdling can be a tremendous advantage. The beginner is advised to review the first two chapters of this book. If hurdling seems especially difficult, go through the learning progressions in Chapter One. Do not neglect flexibility and weight training, as both can aid steeplechase immensely. Do a majority of the early learning stages on the grass to avoid injury. As proficiency in hurdling comes, beginners need less technical work and are able to concentrate more on flat training.

TRAINING

The steeplechaser should train in one or two directions, toward the 1500 and mile, or 5000 and three-mile, depending on his forte.

In the fall, compete in cross-country, emphasizing hill work for strength. The pre-season and in-season training progresses normally toward more interval and speed work. The amount of work over the barriers depends on the individual's inclinations and ability as a hurdler. In the pre-season, do barriers perhaps once every two weeks. In-season, do them a maximum of once a week, depending on the amount of racing.

Vary the pace of the workouts during these two seasons to simulate race conditions. It is not advisable to try to do faster than race-pace work over the barriers as this had the tendency to disrupt the timing.

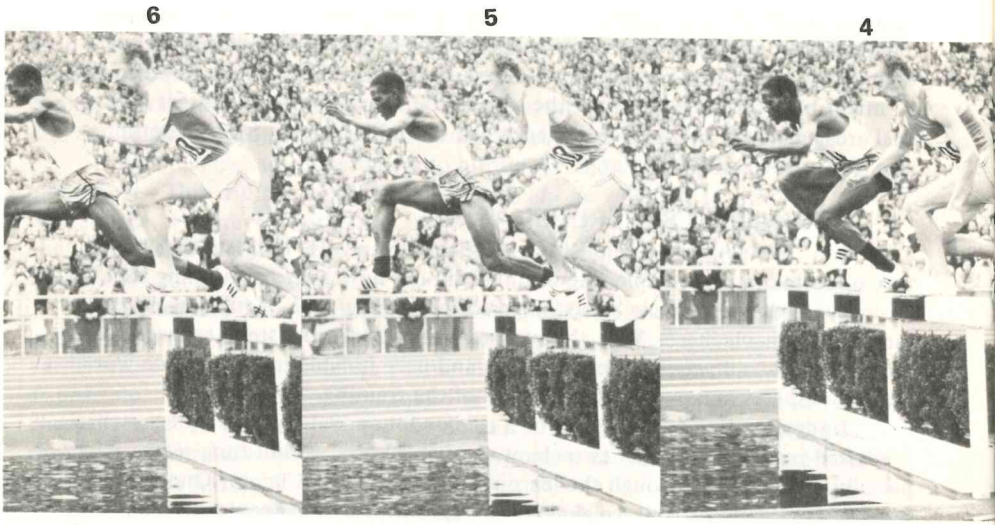
Suggested workouts:

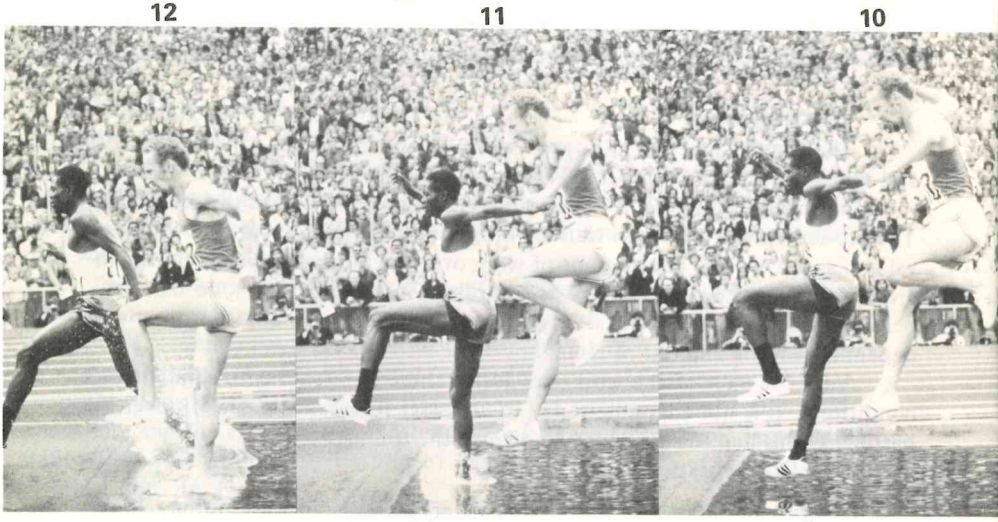
1. Run an 880 at pace with five barriers per lap—no water jump. Jog a 440, then do a 440 over five barriers—no water jump. Jog a 440 and repeat two or three times.

2. Run a 440 on the flat at faster than race pace and run the second 440 over barriers at race pace.

3. For the more advanced competitor, try a mile steeplechase—without a water jump. Then jog 8-10 minutes. Repeat. This is good for testing the state of fitness if no steeplechase race is available.

4. Set up intermediate hurdles at arbitrary distances apart on the grass and do 110 repeats over two or three hurdles. This teaches how to eye the distance to the hurdle and is a good drill to work on hurdle technique.





Ben Jipcho

(Kenyan silver medalist in the steeplechase at the 1972 Olympic Games; world record holder at 8:14.0) Jipcho exhibits a takeoff similar to that of a high hurdler, leading with the knee and with the opposite arm forward (photo 1). He is placing his foot on the

rail in photo 2. In photo 3, he is crouched over the foot, and in photo 4 he is ready to thrust forward off the barrier. Photos 5-7 show this forward thrust. In photo 11, he lands in the water and is ready to take a good first step out of the water (photo 12).

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