

TECHNIQUES OF THE SIX FIELD
EVENTS OF HIGH SCHOOL TRACK

by 503

JAMES ALLEN MAENDELE

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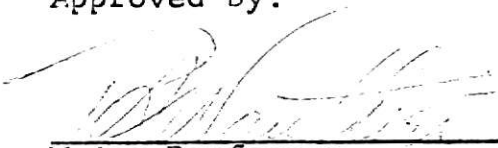
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Approved by:


Major Professor

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INTRODUCTION

Every day, young people of all nations gather on the athletic fields of the world to participate in the sport of track. They participate because it is an enjoyable experience and worth doing solely for the fun of it. As an amateur sport, there is no opportunity for monetary gain. However, within each heart a desire is carried for the perfection and the skill which may someday be rewarded by the highest athletic honor attainable by man. This a chance to participate in the Olympic Games.

Most athletes participating in track realize that to attain perfection they must practice diligently and make sacrifices in their living habits and upon their leisure time. Few, however, understand the essentials of the training process or the fundamental principles of their events. Many practice for years attempting to achieve perfection, but not knowing what perfection is nor how to go about seeking it.

To practice without a knowledge of the fundamentals is a slow process, frequently and sometimes pathetically wasteful of the entire period of an athletic lifetime. To imitate others blindly without understanding the reasons for their actions is an equally inefficient learning procedure which results in a periodic change of style or training with the advent of every new champion.

It is hoped that the thoughts expressed in the following pages will brighten those long hours of practice, make them

more meaningful and, in the process, perhaps a little more fruitful.

PURPOSE

The purpose of this report was (1) to provide the vital information of technique and how to accomplish perfection in the track field events. (2) to aid myself towards becoming a complete coach of track and field.

It is hoped that this report may be of some value to the success of other coaches in the form of improving the athlete.

REVIEW OF LITERATURE

The review of literature at Kansas State University shows no evidence of reports or thesis pertaining to techniques of track and field. The only literature available on track and field is reports of intramural activities in some of the larger high schools of Kansas. Many books have been written by leading track authorities throughout the United States. Some of these books are available at the library at Holcomb High School, Holcomb, Kansas, and were used as reference for this report. However, this report is based primarily upon articles written by leading track coaches and authorities in the United States.

METHOD OF STUDY

The material was gathered from books and magazines at the library, Holcomb High School, Holcomb, Kansas. The articles

were collected from the Athletic Journals, Scholastic Coach, and Coach and Athlete dating back to 1960. This data was compiled to give the best techniques, according to leading authorities, for coaching high school youths in the field events.

RESULTS AND DISCUSSION

Discus. The discus throw dates back to ancient Greece and the first Olympics. This event is one of the more difficult events in track. It takes a little different type of individual to participate in this event than the shot put. This individual must develop the arm muscles so they are long and not the bulky type of muscles.

There are two basic styles of throwing the discus. The Orthodox, or older method, and the Minnesota style developed by Jim Kelly, track coach at Minnesota University. Usually the Orthodox style of throwing is used by athletes learning to throw the discus for the first time, while the Minnesota style is used by the athlete after he has developed. The basic contribution made by the Minnesota style is that greater speed and momentum can be used more effectively than with a $1\frac{3}{4}$ turn of the Orthodox style. The difference between the Minnesota and Orthodox style is one of body mechanics which enables the thrower to be further off balance during the turn, thereby, taking advantage of the speed generated by a falling object. Yet, the mechanics of this style enables the athlete to hop under the falling body into the power position for discus pull and delivery. This is the advantage gained over the Orthodox style. The thrower attempts to keep the center of gravity well ahead of, rather than slightly ahead as in the Orthodox method.

The position of the head is very important at the beginning of the turn. It is tipped down-ward and backward and at the

same instant the hips and trunk pitch forward from the center of gravity. The shoulders, trunk and head are pitched forward toward the front of the circle. Thus the Orthodox style of throwing differs in body mechanics and not throwing technique or foot work, because all are basically the same. Another factor of difference is the ability of the thrower to spin around faster in order to get the foot and particularly the right leg under the body, when the power position is reached. The spin adds speed and more momentum and causes the delivery from the power position to have a greater force than the Orthodox style. When the turn begins, the body weight shifts to the left foot as in the Orthodox style, but as the thrower pivots, he drops his left shoulder toward the center of the circle. This along with the head and trunk cause the body to fall downward and forward. This creates a natural hop as the thrower must hop or else fall completely off balance. The center of gravity is lower on the Minnesota style and this cuts down the danger of landing in the center of the circle on the right leg with it semi-straight. The world's greatest throwers use this style more than the Orthodox method.

With a beginner one must realize that it will take at least three to four years to develop into a good discus thrower. Hence, one should realize that it takes time, practice and patience to teach and learn the proper methods and techniques of throwing the discus. According to authorities, the technique of throwing can be described in the following six essential phases:

1. Grip
2. Stance
3. Arm swing
4. Spin
5. Delivery
6. Recovery

Grip. The first skill a discus thrower must master is how to hold the discus. The discus should be held in the palm of the hand with the first joint of each of the fingers on the edge. Thus, the fingers will somewhat overlap the edge of the discus. The thumb is about forty-five to fifty degrees to the index finger. The thumb tip lies just at the outer edge. The fingers are spread, depending upon size of hand of different individuals. The athlete with a large hand grips the discus so that most of his hand is behind the center of the discus. If one has long fingers the first joints are placed just over the edge. The short fingered individual has the tips of his fingers over the rim. To test his grip, the athlete stands at the front of the discus circle and practices scaling the discus. To do this, he swings his arm back and twists his body to the right. He then swings the arm upward at a forty-five degree angle and lets the discus spin off his index finger.

When one can thrust the discus through the air this way in a flat spin, throw after throw, the athlete is ready for the next step.

Stance. In the Orthodox and Minnesota style of throwing, the thrower begins by facing to the rear of the circle with his feet about eighteen inches apart and straddling the circle diameter line. The actual placement of the left foot from the rear of the

circle varies with each individual.

Arm swing. The preliminary swings of the discus should be in a rhythm and in tempo of relaxed coordination. The discus shouldn't be swung carelessly or without rhythm as this will cause one's coordination to be off and a poor swing will develop. The preliminary swing should be close to the place in which it is to be delivered and at a rhythm and rate consistent with the thrower's actual turning speed. The discus should be swung somewhat parallel to the ground on preliminary swings. It should pass slightly upward from the breast to the left shoulder if the thrower is right handed. The athlete should take no more than three preliminary swings.

Spin. The object of the spin is to enable the athlete to release the discus at a far greater velocity than with a standing method. It must be a smooth, fast move, and the arm, leg and body must be in proper position and rhythmatically coordinated on the throw.

When the preliminary swings are begun, remembering not to take more than three, the thrower takes an extreme twist to the right. At this point the body weight is on the right foot and the athlete shifts his weight over the slightly bent left leg. The hips drop lower and the turn begins. If the left heel is pulled counterclockwise, it will aid the turn and make it faster and easier. The thrower pivots on the ball of his left foot and spins around with the left knee and his arm and shoulder trailing. His trunk is erect and his body is inclined highly forward toward the front of the circle to aid in forward momentum. As the right

foot starts over and around the pivoting left leg the thrower must guard against swinging the discus into too wide an arc. The bent right leg must follow around and forward very close to the left leg. The thrower has completed one-fourth of his turn at this point.

The left leg leaves the ground as the thrower hops down onto a bent right leg. During the turn the right shoulder and throwing arm should be held back so they trail the turning body. With the turn completed the right leg is still bent ready for the drive into the throw. The left leg is almost straight. Pull the discus through at about hip level as the right leg and hip snap inward. The turn should be slow at first but increase in speed, a smooth even spin that leads into a driving throw.

Delivery. The arm of the thrower acts as a whip rather than a pulling force to the discus. The left leg now comes into play activating the lift and straightens as the body weight passes over it. The left arm opens upward vigorously and back in order to put a strong stretch on the chest muscles. The discus is released at the tip of the right shoulder, with a vigorous arm and shoulder pull. It is released in the same plane as the forearm. The discus sails upward at an angle of about thirty to thirty-five degrees from the horizontal.

Recovery. As the thrower builds up speed and momentum for his delivery, he must be ready to check himself after delivery or else swing completely out of the circle and foul. If the left foot is placed too far off to the left of the front circle center, it makes checking impossible. The thrower must reverse soon after

his delivery as possible, but not too soon as it will hinder the delivery. The discus is released and the weight is carried over to the right leg and the left leg is dropped backwards. The right leg goes into a short series of quick hops which control the body and keep it within the circle. The left leg and the right leg must be coordinated and timed properly or a fall in or out of the circle could ruin a good throw. The foot or any part of the body must not touch the ring or the side of it. The result is a foul and loss of the throw.

Shot Put. The technique of the shot put has changed very little since the creation of the O'Brien style in 1950. Perry O'Brien developed his technique to get more momentum, drive, and force from the lower parts of his body.

Here is a breakdown of the standard technique, according to many of the leading authorities:

1. Grip and shot placement
2. Stance
3. Hop
4. Weight shift
5. Delivery and release
6. Recovery and reverse pivot

Grip and shot placement. Listed here are three ways to grip the shot. First, hold the shot with fingers slightly spread so it rests comfortably in the upper part of the hand. No part of the shot should be lower than the ridge which separates palm from fingers. Some athletes bend the little finger forward to furnish better control and also stability.

Second, this grip is for a short fingered individual or the novice. In this grip the shot sits low in the palm of the hand

with fingers widely spread. Third, this grip is a combination of the first two and is generally the one used in high school today, with a few exceptions. It is preferable not to hold it high in the fingers because one can develop more speed by allowing the shot to roll up and off the finger tips as it is delivered. If the shot comes off properly, it will spin. A shot that does not rotate has been released from the palm with subsequent loss of power.

It is best not to place the shot in the throwing hand until the athlete is ready to begin. The shot is then placed against the lower part of the chin about halfway between the side of the neck and the front. The athlete holds the right arm closer to and more in front of the body, relaxed at an angle slightly less than ninety degrees. The left arm is up in the air, this aids in balance.

Stance. The right foot is placed on a straight line to insure a straight line action across the circle. The shoulders face the rear in the manner introduced by O'Brien. The athlete should focus the eyes on a peg, or object, approximately six feet behind and slightly to the right of center. Looking down at the peg or object instead of keeping the eyes on a point at eye level at the back of the ring helps to keep the body lower during the hop. All of the weight is concentrated on the right foot, at this point the right leg is straight, with the toe of the left foot touching the concrete surface for balance. Only when the athlete is perfectly balanced in this position will he go into a crouch.

Hop. The hop is initiated by a bending of the right knee and a lowering of the upper body until the athlete attains a position where the back is almost parallel to the ground. This movement helps to overcome inertia and assists the athlete to move more quickly across the ring. The right knee is bent at about a fifty degree angle in this position. The muscles of the right leg and arm become very tense, while those of the left leg and arm should be as relaxed as possible. At this point the body is doubled up so that the right side of the athlete's chest lies just about on the right leg thigh. The left foot heel is brought in toward the buttocks and kicked quickly in the direction of the throw. This first movement is a glide backward maintaining contact with the circle at all times. The hop must be carried out low, with this in mind the closer the chest is kept to the right thigh during the glide, the lower the body will be at the middle. When the right foot is at the center of the circle, in the same bent position, it points seventy degrees to the thrower's left. The left leg should be extended fully to help it land more quickly at the toe board. The shot is still cradled along the side of the neck.

Weight shift. The left foot has been extended forward and is now planted firmly against the toe board. The long delivery of the upper body is ready to be applied. Power in the shot comes primarily from the legs and big muscles of the body.

When the right toe touches the center of the circle, there is a lateral movement of the body causing the right heel to become firmly planted and the weight to shift forward so that it is more

evenly balanced between the two legs. The instant the right toe lands, the left arm is pulled around at the same angle the right arm will strike. The weight shifts quickly in an explosive action from the right to the left side. The left side becomes the fulcrum. The hips, back muscles, and the chest supply thrust. The feet must be in contact with the throwing surface so there can be a vigorous push.

Delivery and release. The delivery starts at the right heel and carried directly along that line, at this moment the right arm pushes upward and forward.

When the right arm is fully straightened, the shot is released with a forward snap of the wrist and a flip of the fingers. At this point the center of gravity transfers to the left leg, which is fully extended. The athlete should raise upon the toes of the left foot as the shot leaves the hand. The right foot remains on the ground until the shot is in the air.

For the best results the trajectory of flight should be a thirty-eight to forty-two degree angle. To aid in the follow through and also in height of the release, the eyes should be kept on the shot during its flight. A very common fault is letting the eyes and head turn to the left, causing the shot to be released too soon.

Recovery. The momentum at this point is so great the athlete must perform a follow through with the left leg swinging back and the right foot landing sideways against the toe board. The left arm has completed the swing back and once again helps balance the body. Two out of ten athletes end up with their right toe pointing

toward the toe board. This, along with the failure to coordinate the legs and arm during the put, is the chief cause of failing.

Javelin. The javelin has had its ups and downs in the United States and never attained the supremacy held in other field events. Our youngsters are brought up playing throwing games such as basketball, baseball, and football, yet we are unable to interest enough young boys in developing the skill of javelin throwing. Scandinavian youth begin to throw small javelins at an early age and progress slowly to the women's size and finally to the men's size implement. They are brought along slowly and grooved in a style which does not result in sore arms to which we are accustomed.

The technique of throwing the javelin has not changed in the last ten years but the methods of weight training have increased the distance the athletes now throw. Some of the weight training ideas of the Finns have also aided many of our javelin throwers today.

The technique of the javelin throw can be described in these four essentials, according to many of the leading authorities.

1. Grip
2. Approach and carry
3. Delivery
4. Recovery

Grip. Listed here are the three basic hand grips; Finnish, American, and Forked.

The Finnish grip is the most popular style used today. In the Finnish grip, the middle finger is the one that is carefully wrapped around the javelin just behind the cord. The reasons are obvious: The middle finger is the strongest finger and it is

attached to the strongest part of the hand. The placing of the finger behind the cord allows for a better grip, prevents slipping and gives surface resistance. The index finger is placed along the shaft much as you would hold a pen or pencil when writing. This enables one to better balance the javelin, and gives him better control. The other two fingers fall into place around the whipcord. The shaft of the javelin lies in the palm of the hand, just slightly raised from the heel. The thumb is placed parallel to the javelin just behind the cords, falling more or less into a natural position aiding in balancing and controlling the javelin.

In the American grip the index finger is wrapped around the javelin just behind the cords. The thinking behind this technique is that it will allow for a better grip. The other three fingers fall into place around the whipcord. The shaft of the javelin lies in the palm of the hand, just slightly raised from the heel as in the Finnish method. The thumb is placed parallel to the javelin just behind the cords, aiding in balancing and controlling the javelin.

The forked grip is used by a very small per cent of the competitive javelin throwers. In this technique the thrower places his index finger on one side and the middle finger on the other side of the shaft at the rear edge of the cord. The other two fingers and thumb fall into place around the whipcord.

Approach and carry. The approach is to build up as much momentum as possible and then use it to the best advantage. The length of the run will depend upon the speed of the javelin thrower. In most cases the average run distance is about ninety-five to one

hundred feet. At least two check markers should be used, one where the athlete starts his run and the second where the left foot should start on the final five steps. At the second check mark, the beginning of the Finnish five step approach, the run has been completed but the momentum gained must be carried through the next five steps. As the left foot strikes the second check mark it forms a right angle with the scratch line or board. On the first step the right foot strikes down at a forty-five degree angle, second step the left foot comes down parallel to the scratch line. On the third step the thrower makes the actual cross-over step, the right foot crosses over the left, striking the ground at a forty-five degree angle of the scratch board. The left foot comes behind the right foot constituting the fourth step and the foot once again forms a right angle with the scratch line. The fifth step is made by the right foot and the foot comes up parallel to the scratch line with the toes pointing to the left. This final step is a blocking step to block the momentum from passing over the scratch line or fouling.

During most of the approach, the javelin must be carried in a manner that permits a relaxed running position and an easy swing of the javelin back into throwing position. There are four common types of carries. The parallel carry is the most common carry used today. The javelin is carried over the shoulder and parallel to the ground. In this method the arm can be cocked quickly for the throw with very little movement involved.

Secondly, the downward carry is where the javelin is carried pointing downward, between the parallel and perpendicular. This method of carrying the implement is not quite as popular as the parallel carry, but the idea of comfort while running through the approach is the main factor favoring this carry.

In the third carry, which is the above parallel carry, the javelin is carried tilted above the parallel during the approach. This method is used very little today as experts feel if the javelin is tilted back the athlete will hold back somewhat on the approach.

The fourth and last carry is the perpendicular carry, where the javelin is carried directly in front of the competitor throughout the approach run. The main fault with this carry is that the athlete has such a long distance to retract the javelin before throwing.

Although the carry is a matter of choice, it should be the one which is most comfortable for the thrower. The style of carry one athlete may use will not be successful for another boy. So choice becomes a big factor for each athlete.

Delivery and release. In the approach run, the thrower holds the javelin above the head, with the elbow forming about a ninety degree angle. The javelin should be parallel to the ground and held in the direction of the run. The thrower's eyes can check the point of the javelin to see that it does not turn during the approach run. If it does turn, the alignment of the javelin will be off when it is thrown.

When the thrower is taking the second step of the five step Finnish cross-over, the javelin should be dropped back to a position parallel with his arm, which should be extended almost straight. The thrower's body should be rotated to the right side of the chute on the third step, and the javelin quickly pulled over the top of his body close to his right ear. The athlete's head should lean to the left to enable the javelin to be brought to as near the center of his body's center of gravity as possible. The longer and greater the pull of the arm, the more power will be put on the javelin. It should be released at about a forty to forty-two degree angle, off the right foot or step three of the five step cross-over. At the release there is a simultaneous shift to the left foot or step four of the five step cross-over.

Recovery. After the javelin has been released, a quick reverse or fifth step of the cross-over insures a powerful follow through. The flailing right arm should continue down in the same vertical plane as the release. As the thrower runs off his fourth step, the flexed right leg comes through, and quickly extend, reaching out ahead of the body to block forward momentum. The right knee flexes, lowering the center of gravity; thus, giving the athlete more control of his body.

Pole Vault. The 1960's, with the advent of the fiberglass pole, resulted in the biggest change in any one track event in many years. With this new type of pole which quite literally projects the vaulter over the crossbar. This has been such a conventional change that at many of the high school meets the

metal pole has been outlawed. The reason is simply that the vaulting box is now being made of fiberglass, and the metal poles are damaging to such a box.

Pole vaulting is one action; one unified and unseparable action which begins with the first step of the run and ends with the landing. Within that wholeness, there are no separate actions, such as the take-off, or swing-up, or pull-up. These are merely words, devices of understanding and communicating. Pole vaulting is one action, but a complex action with many distinguishable phases. Here broken down is the technique of vaulting according to many authorities:

1. Grip
2. Run and pole carry
3. Pole plant
4. Take-off
5. Swing and pull
6. Clearing bar
7. Landing

Grip. The right hand is slightly behind the body and grips the pole with palm up. The left hand is about eighteen inches away and grips the pole with palm down. When the vaulter lifts the pole to begin the run, the left hand will move forward until it is almost three feet from the right hand.

A good rule for beginners is to place the back hand about one foot higher on the pole than the height of the cross bar. Most beginners have not perfected the technique of clearing the bar and the higher hand grip will compensate for this fault. Experienced vaulters generally have one grip no matter what height the bar is raised. With one grip the take-off, pole plant, and run will always be the same.

Run and pole carry. Just as in other track events the athlete must precisely measure the running approach. This depends a great deal upon the athlete's speed but a happy medium would be around one hundred twenty feet. As to the actual approach distance for the novice, it would be necessary to have two or three check marks to assure the athlete of his approach or stride plan. As the athlete gains confidence in the take-off, one check mark is sufficient. To locate the marks the athlete must first find his take-off mark by placing the front end of the pole in the vaulting box and extending the pole over his head with both hands. The athlete's body should be absolutely erect so that a straight line could join his right hand, back of his head, and left heel.

The mark can then be placed at the side of the runway, even with the toes of the left foot. A right-handed vaulter will take-off with his left foot so that the body can swing past the pole on the right side.

With the take-off set, the athlete proceeds to place his other marks, remembering to carry the pole when running through his approach to set these marks, otherwise they would be useless. The weight of the pole naturally affects the length of the stride. The vaulter's run should be as fast as possible within the vaulter's limits of strength, control and relaxation.

In carrying the pole the body, as a whole, is facing straight ahead as when sprinting. The weight of the pole is carried primarily by the thumb and forefinger of the right hand. The grip on the pole should be just firm enough to hold the weight of the pole, as

excessive effort tends to tighten up the arm and shoulder muscles. As always, relaxation is essential to best momentum, and to a smooth take-off. The position of the pole during the run should be nearly horizontal to the ground. This will minimize the adjustment during the planting of the pole.

Pole plant. The technique of the pole plant is one of the most controversial points in pole vaulting. The problem here is changing the momentum gained from the running down the runway to a vertical lift of action to clear the bar. This movement must be fluid and continuous, avoiding any jerk or irregularity. The right arm moves the pole into position for the plant, it shoves the pole through the left hand, leaving the hands about eighteen inches apart. Actually, the pole should scrape the hip slightly as it is thrust forward. This slight scraping will insure a straight pole plant rather than one to the side which causes the athlete to hit the pole on the ascent. The front tip of the pole is placed on the V-shaped surface of the box and then slides forward until it jolts against the back end of the vaulting box.

Another point to remember in the pole plant is that the vaulter's eyes should be watching the back of the box until the pole hits and then his eyes should move up to the bar.

Take-off. At about the same moment that the pole hits the back end of the box, the left foot hits the ground for the take-off spring. This is quite like the take-off in the broad jump, though not quite as strong, as the arms will help raise the body in this event. At the initial point of the take-off, the arms

are flexed. Thus, they can cushion the shock of transferring the weight of the body to the pole by gradually extending. The knee is slightly bent at the take-off and the foot (left) should be in perfect line with the point of the pole, so that the whole momentum of both body and pole is directly forward. The common fault of placing the foot to the right and the pole to the left of the line of the vault throws the entire vault off-balance. Then the right leg swings past the left leg to lead the body on its upward journey.

Swing and pull. The moment the vaulter's take-off foot leaves the ground the swing should begin. As the body swings forward the vaulter should try to stay as close to the pole as possible with knees drawn slightly up. When the hips are level with the shoulders, the arms begin their pull to bring the body into position of a handstand on the pole. The old geometric axiom which says that a straight line is the shortest distance between two points applies here. A vaulter must keep a smooth straight line of flight up to the headstand. The vaulter pulls his body right along the pole, keeping legs tucked up so that the feet do not touch the bar as they pass. At the top of the swing the vaulter begins the turn. The turn begins when the right leg reaches a point just above the bar, the left leg kicks vigorously upward and outward to reverse the body so that the vaulter is facing toward the pit.

Clearing the bar. Two body positions are used in clearing the bar, the flyaway and the jackknife. The flyaway is used on vaults where the hand grip is above or even with the cross bar. The vaulter allows his momentum to carry the body over the bar,

then shoves the pole back with both hands. The jackknife is used when the grip is below the level of the crossbar. The vaulter drops his feet over the bar, still holding on to the pole, he raises his hips, releases the left hand, then shoves off with his right hand to help carry his upper body over the bar.

Landing. Here relaxation is essential. Some athletes extend the legs directly under their body and slightly bent at the knees so the legs will absorb the shock when landing in the pit. While others will do a half roll over and land on the back or back of shoulders. This technique is advisable only if plenty of foam rubber, or an air mat is used for a landing surface.

High Jump. There are currently two accepted forms of competitive high jumping; the western roll and the modified western roll. Each of these methods have so many variations that, in a way, every high jumper can be said to have his own individual style.

The belly roll, an adaptation of the western style, is the style commonly used today. It is popular because greater height can be obtained than in any other style. The western roll has many names such as; layout, straddle, barrel roll, belly roll, or simply the roll. The technique for all previously mentioned western rolls are basically the same.

Technique of the western roll can be described in these five essential phases, according to many of the leading authorities:

1. Approach
2. Gather
3. Take-off
4. Airborne
5. Landing

Approach. The approach in the high jump will be broken down into four essential parts.

1. Angle of run
2. Length of run
3. Speed of run
4. Method of run

The angle of run. The greater the angle of run, the more the cross bar forces one to jump up vertically, but the more difficult it is to drive a straight leg up from a close take-off, and the greater the lateral distance becomes, but the greater the tendency to dive and slice along the bar. The best angle is approximately thirty-seven to forty-five degrees. With this in mind the straight leg can come up with a close take-off. This run will begin on the left hand side of the cross bar facing the jumping pit. The left side will usually be for right handed individuals taking into consideration the right leg will give more kicking force upward. The same would be true for one approaching from the right side to get more lifting force from the left leg.

Length of run. A run must be long enough to give gradual and smooth acceleration. Two check points are needed along the approach run. One check mark at the start of the run, another check mark at the point of gather. These check points are a must to be a successful jumper. Once the check points are mastered they can be measured very easily for all competition at any meet.

Speed of run. Great speed is not essential in the approach, although the jumper should seek to attain some gradual acceleration

in the run. Rather than speed, concentration on making the run smooth and uniform on every try is very important.

Method of run. All high jumpers use three or four fast steps just prior to the take-off. Jumpers differ in the number of preliminary steps, the number of check marks, the speed of the early steps, the lowness of the crouch, and the angle of the body at the take-off.

Gather. The conversion of momentum from a fast run toward a vertical jump requires great strength of related muscle groups. At the third stride from the take-off there is a natural "gather" of the body preparatory to springing. At this point both arms are pulled back and down; then forcefully up to aid upward drive. The eyes are focused well above the bar, this aids in a backward lean. The heel strikes the ground first and hard. At this one instant, the left leg is straight so as to block forward progress, then it bends to aid forceful left leg extension.

Take-off. The right knee is bent on the swing forward, but will straighten out on the vigorous kick up. The kick of the right leg should not be at the bar, but rather at the standard on the right side and almost parallel to the bar. Both arms should help with the take-off by lifting up. Then the right elbow and shoulder drive above the left as the left arm and hand drops down toward the crotch. As the body prepares to leave the ground the jumper rocks up on the toe of the take-off foot, completing the extension of knee and ankle to obtain proper body lift. The jumper is conscious that the big toe is the last part of the leg

to leave the ground. Inertia will assist in carrying the body forward and upward if the hips and shoulders are back of the take-off foot.

The method of clearing the bar is largely predetermined by the angle of take-off, the degree of extension of the lead leg, the degree of forward inclination of the head, arms and shoulders; and the extent to which the powerful take-off leg extension is diminished by a twisting attempt to aid body rotation. If the forward momentum of the run has not been fully blocked, so that the jump continues forward toward the crossbar, the jumper's style will necessarily be some variation of a dive. In contrast, if the lead leg is fully extended and driven well above the bar; and the head and chin are erect so as to rise momentarily above the bar, then dropped quickly down: if the direction of the body's center of weight is close to the vertical, then the jump can be called an orthodox straddle or belly roll.

Airborne. When the body is in flight the left leg is tucked quickly, preparatory to clearing the bar. This occurs by an upward kick or a complete roll. The leg must not drag.

One problem that is encountered at this point is the left arm or trail hand. The arms themselves aid the jumper by punching upward at the take-off. Getting the vertical height first, then concentrating on "lay out" by extending the body along the bar, belly parallel to it, face down. The left arm can either be put out of the way or used to help rotate the body over the bar. This position is usually determined by the jumper himself. Brumel puts his hand on his abdomen. Shelton puts his almost

flat along his left side and John Thomas placed his left hand in the crotch and as he cleared the bar it was pulled out and up.

The two pivotal points of the body must now be considered. These two points are the shoulders and the hips. In order to complete the jump, the right leg and right arm are thrust across the bar and toward the pit. At the same time the jumper ducks his head as if to look underneath the crossbar, to pivot the shoulders over it. The left knee and hip also roll over.

One very important factor to remember at this point is the principle that governs the movement of the ends and the middle. In the high jump this principle is related in the following ways: as the lead, hand, arm and leg clear the bar they are forced down thus causing the rest of the body, especially the hips, to rise. As the head clears the bar and is forced down this will cause the body to rotate around its center of gravity which at this point will be outside the body and somewhere near the bar itself.

Landing. The jumper should then land on his back in the pit.

Long Jump. For various reasons, the long jump has not progressed as rapidly as other events. Few high school boys specialize in this event. The outstanding long jumper often has the talents of an excellent sprinter, quarter miler, hurdler, high jumper, or polevaulter. With this in mind and the limited number of events one can participate in each track meet, usually eliminates the long jump. However, long jumpers without outstanding sprinting ability may become top performers if they

specialize in the event and perfect all of the details of technique.

The long jump can be broken down into four steps, each of which must be mastered by a champion, according to leading authorities:

1. Approach
2. Take-off
3. Action in the air
4. Landing

Approach. Many factors influence the length of the run, such as; maturity, age, strength, and speed. In general, older, stronger, and more mature boys will be capable of handling longer runs. Faster boys, who accelerate more rapidly, can use shorter runs than the slower boys. The approach run should be long enough to attain near maximum velocity. As a rule, the high school jumper will run between one hundred and one hundred forty feet, or nineteen to twenty-three strides, but there is not a set standard or pattern that can be established as the best distance.

Regardless of the length of the run, at least two check marks should be used. The athlete should stand on his mark at the head of the runway and start hard and relaxed in the same manner each time. The second check mark should be placed approximately sixty feet from the take-off board and is merely a green light when the runner passes this mark, concentrating on maximum speed for his run.

For the individual who consistently arrives beyond the take-off board, the athlete should move both check marks back the same distance until the right distance has been obtained. Runway

surface conditions and wind velocity will cause changes in the check marks.

One of the most common faults among novice long jumpers is looking down at a take-off board. It is extremely important that the habit of looking down at the board not be developed, for it destroys mental concentration of running off the board and a long jump.

Once the athlete is sure of his check marks, then he can concentrate on obtaining maximum relaxed speed. Confidence in the approach is very important and can only be gained through a minimum of change.

During the last three or four strides the trunk should be brought upright or erect, the hips slightly lowered so the powerful extension muscles of the legs are in an excellent position for a vigorous, explosive, take-off. It is important to accomplish these points with little loss of speed, because speed and spring together give the jumper the long jump.

A jumper should also change his mental concentration from speed to actual jumping. The presence of any doubt about hitting the board correctly will destroy his mental concentration on jumping.

Take-off. The take-off foot should come to the board in advance of the body, with the take-off leg partially flexed. As the body passes quickly over the take-off foot, the leg should extend powerfully and the foot should complete a heel-ball-toe action. At the instance of take-off, the center of gravity should be directly over the take-off foot. As the rocker action

of the foot develops, the center of gravity moves ahead of the foot and is well out in front as the jumper actually leaves the ground. The jumper tries to get his center of gravity as high as possible.

The free leg should be swept forward and upward quickly and powerfully to assist in lift at take-off. Every part of the body aids in the lift: both arms go up vigorously, the head and chest go high into the air, and the back is well arched, aiding the lifting action of the hips. Keeping the chin up helps the jumper keep his head in proper position.

Maximum power is generated by keeping the take-off foot in contact with the board as long as possible. A good rocker motion of the foot is a must in producing this action.

Action in the air. The first movements off the board are concerned with getting maximum height. The head and chest are up, the back is arched, the lead-leg is flexed, the arms drive forcefully. Some such movements are natural, even unavoidable. Any school boy will demonstrate them on his first attempt. But their exact timing, their maximum force, and their optimum direction are far from natural, and must be carefully evaluated, and persistently practiced.

Subsequent movements in the air depend upon the manner of take-off. In this, jumpers vary greatly. At one extreme of little action, there is the sail style by which a jumper jumps high, sits down in the air, and waits for the ground to come up. Next in simplicity is the hang, a style which emphasizes the arch

of the back and backward throw of the head, with a forward jack-knife action just before landing. Then there are two running-in-the-air styles; $1\frac{1}{2}$ strides is often called the hitch-kick, by far the most common style used today, but some do use $2\frac{1}{2}$ strides.

Some years ago, there was much argument as to the relative value of these styles for increasing momentum in the air. But there is no scientific basis for such opinions. For every forward action there is an equal and opposite backward action. Momentum is a resultant of the run and take-off and cannot be changed while in the air.

But these styles do have different values in terms of efficient landing. There must be relaxation and balance in the air so that at exactly the right moment, not too soon and certainly, not too late, the heels can be extended forward as far as possible and the buttocks can be brought through without touching the pit. In general, no movement at all, as in the sail style, tends toward tension and imbalance. The hang is an active style but must be precisely timed. Most champion jumpers today find the hitch-kick very satisfactory for balance, relaxation and action.

The exact method of action in the air is not crucial, but the exact timing, the exact degree of relaxation, and the exact balance which a jumper uses in whatever style he masters is very crucial. Mastery of one's own style in the run, in the take-off, in the air, and in the landing is very crucial and must be attained by practice.

Landing. In landing, the jumper should drop the chin to his chest, break forward at the hips, flex his knees, swing his arms downward and backward, and keep his buttocks low so that they will come between the legs. This entire action must be quick, smooth, and coordinated.

SUMMARY

Discus. A beginner must realize it will take at least three to four years to develop into a good discus thrower. It takes time, practice and patience to teach and learn the proper methods and techniques of throwing the discus. At first after the beginner has learned the grip, swing and release from a standing position, he should try stepping forward and dropping into a throwing position and throwing. This improves the hip and leg action which will come later in teaching. The discus is one of the events which must, and can only be taught in parts. When these parts are mastered and then coordinated, a real discus thrower begins to develop.

Shot Put. The technique of the shot put has changed very little since the O'Brien style was introduced in 1950. Randy Matson has changed one technique of the O'Brien style, that is at the back of the circle at the hop. Matson pushes off with the toe instead of the heel like O'Brien. This is effective for Matson because of his size, he has little trouble getting to the center of the circle which many high school boys encounter.

The explosive move of the shot putter across the circle is a very important factor. The athlete must have this explosive movement but must also have control. When the sixty foot put became a reality the technique remained the same but training did change. At this time weight training was introduced into the athlete's schedule. Working with heavy weights during the

off season and lighter weights when the athlete was in competition, the athlete achieved this explosive power and movements necessary for control and put the shot farther.

Javelin. Why is Finland, with only four and a half million people, controlling world competition in the javelin? The answer is their training methods. Why can't our athletes be as determined and make a better competitive showing?

This country has a fantastic amount of talent available for track and field, it is a real tribute to Finland that they are able to so easily defeat us in the javelin event. Their success is the result of knowledge. Only in the last ten to fifteen years have we been able to beat the Europeans in the distance events. Some of our runners while in Europe observed their training methods. A few of the European coaches came to our country, and now because of their assistance, we are as good or better than any country in these events. The same is true with the javelin. The Finns have shown great success as a result of their training methods. Coaches today attempt to approach the perfection of Europeans in this event.

In recent years much controversy has been in favor of dropping the javelin from high school competition. The main reason given is that the javelin event is dangerous. If so, we need to instruct individuals at an early age of this factor and possibly this could aid in its perseverance.

With the javelin an Olympic event it should be retained at the high school level in hopes this event will flourish and that

someday with the European technique, this country will have talent able to compete with all other nations.

Pole Vault. The pole vault is an attempt to convert the horizontal momentum of the body, gained through a run to a vertical direction through the aid of a light pole.

There are many factors which contribute to pole bend, but the three most important are the weight of the vaulter, the height of his top hand on the pole, and his speed at the time of the pole plant. An increase in any of these will increase the degree of pole bend.

The vaulter should select a pole that requires a maximum effort to bend. The stiffest pole he can find that will bend and react. It must be remembered that a vaulter only gets out of a pole what he puts into it.

Since the advent of the fiberglass pole the record seems to be in jeopardy in each and every meet. In no other track event has the record increased two feet in only eight years. At the beginning of the 1960's track officials talked in terms of a sixteen foot vault. It seemed that by the time people accepted the sixteen foot vault, the vaulters were clearing seventeen feet. Now many individuals are accepting the seventeen foot vault and no one knows just how high or what the limit will actually be for the fiberglass pole.

High Jump. The "belly roll" gives a slightly greater lifting force and brings the center of gravity even closer to the bar than any other style. The heights that have been obtained in the past

twenty-seven years have been greater than any other technique. It is possible that some phase of the belly roll someday will possibly be revised as we learn and understand more about gravity. But, as the knowledge of man, the performance of athletes, equipment, and training methods continue to improve, this style of jumping will be around a long time.

The "Fosberry Flop" of the 1968 Olympics, a new technique of high jumping, which one man has developed for his own personal capabilities would not possibly work for many of our athletes today. This style could be very dangerous to the young athletes because of the method of landing. Most of our high schools today actually lack the facilities for such a style of jumping.

If one desires to be outstanding in any event he must be prepared to practice and train year around. Once the technique has been mastered it is very difficult to change to an entirely new style of jumping.

There are many complex mechanical problems associated with jumping, but my objective is merely to point towards a better understanding of techniques. One must be familiar with Newton's laws of motion, and able to interpret and apply them intelligently.

Long Jump. The long jump has not progressed as rapidly as other events in track and field. Very few high school boys specialize in this event. The qualities that make up a good long jumper are so numerous and events are so limited, that the long jump is usually eliminated. Some boys without this outstanding ability do become top performers if they specialize in the

event and perfect all of the details of technique.

The possibility of the long jump progressing in the future depends upon the triple jump. If the triple jump becomes a part of every track and field meet, it will influence more coaches, and inspire the athlete to compete in this event. From this assumption the athlete will have two jumping events instead of the usual one, the long jump.

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TECHNIQUES OF THE SIX FIELD
EVENTS OF HIGH SCHOOL TRACK

by

JAMES ALLEN MAENDELE

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The main objectives of the field events are to jump farther, jump higher, and throw farther than the other competitors. The only way to accomplish this is through the perfection of technique. According to authorities of track and field the techniques in this report are considered the best, but alterations must be made for individual differences.

The information in this report has been gathered from articles written by leading track and field authorities of the United States. The articles were taken from the Athletic Journal, Scholastic Coach, Coach and Athlete, and other books. These articles dated from 1960 to 1969.

The two basic styles of throwing the discus are the Orthodox and the Minnesota style. The difference between the two styles is one of body mechanics. The Minnesota style enables the thrower to be farther off balance during the turn, thereby taking advantage of the speed generated by a falling object. According to authorities the technique of throwing the discus can be described in six essential phases: grip, stance, arm swing, spin, delivery and recovery.

The technique of the shot put has changed very little since the creation of the O'Brien style in 1950. The purpose of this style was to get more momentum, drive, and force from the lower parts of the body. Here broken down are the standard techniques of this event: grip and shot placement, stance, hop, weight shift, delivery and release, recovery and reverse pivot.

The technique of throwing the javelin has not changed in the last ten years, but the methods of weight training have increased the distance the athletes now throw. According to many of the authorities, the javelin technique can be described in these four essential steps: grip, approach and carry, delivery, and recovery.

With the advent of the fiberglass pole in the 1960's the biggest change in any one track event resulted. Pole vaulting is one action, but a complex action with many distinguishable phases. Authorities have broken down the technique of pole vaulting into these phases: grip, run and pole carry, pole plant, take-off, swing and pull, clearing the bar, and landing.

Currently there are two competitive forms of high jumping, the western roll and the modified western roll. All high jumpers have their own variations of these forms. Techniques of the western roll can best be described in these five essential phases: approach, gather, take-off, airborne, and landing.

The long jump is the result of properly combining many skills. The better long jumpers have developed the proper approach, take-off, action in the air, and landing that is best for their individual needs.