

A STUDY OF HOW TO DEVELOP ATHLETES
IN THE JUMPING EVENTS IN TRACK AND FIELD

by 4589

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INTRODUCTION

Records in track and field have been broken each year at an amazing rate. Many people have been asking themselves: How much can these records be broken by, or where is the stopping place for this athletic excellence in track and field?

There are many reasons for this great success in track and field. The new tartan tracks and improved pole vaulting poles have been a major reason for many of these new records. But, with all these improved facilities and equipment, we still have a human athlete doing the running or jumping. Through new techniques and training methods this athletic excellence may continue at an unpredictable rate.

Purpose

If records in track and field continue to be broken, coaches and athletes need to learn the best techniques and follow the best training program. There are many athletes who could break records, but somewhere along their athletic career the coach has probably failed to teach the proper techniques or train the individual properly. Possibly many athletes are ruined by using improper techniques and training methods.

The purpose of this study was to present new and improved techniques and sound training procedures that jumpers can use in the perfection of their jumping in the long jump, the triple jump, and the high jump.

Method of Study

The information for this study was collected from the author's involvement in track and field the past seven years, as a participant and as a coach.

Much of this information came from the track program used at Kansas State University during the years 1963 to 1967 while participating in track and field. Information was gathered from articles written by leading track and field coaches while coaching at Wakefield High School, Wakefield, Kansas, the past three years.

A great deal was learned about the jumping events from trial and error procedures used over these past seven years.

Many tips were received from leading coaches in track and field through informal talks and coaching clinics.

One of the best sources of new techniques on track and field was found to be the Athletic Journals, published monthly by the Athletic Journal Publishing Company, Evanston, Illinois.

Information for this report also came from the files of Mr. Deloss Dodds, Head Track Coach, Kansas State University.

DISCUSSION

The purpose of this study was to give some useful techniques to aid track and field athletes in the jumping events. The first part of the report is divided into three sections: The Long Jump, The Triple Jump, and the High Jump.

The Long Jump section is divided up into the approach, the take off, the jumping style, and the landing.

In seven years of competition and coaching, one of the most disconcerting things to watch in track and field has been the poor fundamentals employed by athletes, especially in the jumping events. From observation of many performers in this event, one can conclude that too many coaches and athletes rely on the natural ability of the jumper and neglect the fundamentals which are so important in any jumping event.

An interesting fact in track and field was that of all existing world records, only the long jump remained on the record books as the oldest record, standing for twenty seven years before it was broken by Ralph Boston. In fact, jumping has only improved two per cent in thirty three years.

In order to be a better than average long jumper, an athlete should have a few of the physical characteristics necessary to excel in this event. The first characteristic is speed and the second is spring. Concentrating on those who qualify, the coach must instill the attitude that the long jump takes as much time to perfect as the pole vault or high jump. This is the area where many coaches have trouble convincing their athletes to develop the proper attitude. Too many athletes want to jump, just on the day of the meet; if they do this they will never reach their full potential.

At Kansas State the jumpers jumped for distance several times a week in preseason, although once the competitive season started they did not jump for distance as much.

A lot of the practice time should be spent on the individual components of the long jump, and then the true test of skill development should eventually show on the day of competition.

The Approach

The first component of the long jump to master is the approach or more commonly called the step.

Learning the step in the long jump should not be attempted until after four weeks of practice. On the year around or the nine month training schedule used on the college level, this practice period presents no problem. But, on the high school level the ideal training procedures are often hard to follow due to the short track season. Many high schools are still playing basketball the first of March, and the first track meets start the end of March. Trying to learn the step too soon will only cause disappointment, because the stride will change as the jumper gets into shape, causing the step to be inconsistent. During the first few meets on the high school level, the step will probably be inconsistent. As the championship meets approach, the jumper should have complete confidence in his step.

Working out the step should be done with the coach. The simplest way is to have the jumper reverse his run in the following manner. Start behind the board at the jumping pit side of the runway. When beginning, measure two walking steps starting with the foot opposite the take-off foot. The take-off foot should be the last to leave as the jumper starts his walk.

Then, take four jogging steps hitting the board with the take-off foot on the fourth step. The jumper should work on this, adjust the distance until he is consistent and then measure the distance. Now, when the take-off foot hits the board, then the jumper should begin his sprint down the runway. Ten steps, or about 90 feet down the runway, he should simulate a jump and his partner should mark the spot of the take-off foot. Sometimes the wrong spot is marked for take off because many jumpers do not gather and simulate a jump at the end of ten steps. Instead, they run straight through causing their step to be wrong when the jumping starts. If the speed down the runway is inconsistent for some reason during competition, the mark used may have to be moved a little to compensate for the inconsistency. After having found the step coming from the take-off board, reverse the procedure. With two walking steps, four jogging, and ten sprinting strides, the jumper is on the board. The jumpers over all run should be around 125 feet. There has never been a world champion who covered less than this distance to get his best jump. With a little practice and an adjustment here and there, the jumper will be charging into the take-off board with the necessary confidence to jump his best. Many jumpers, especially on the college level, will have another marker, usually placed four strides before the take off. This enables the jumper to have a last second look at his step before he takes off.

The Take Off

The next component of the long jump is the take off. There are two schools of thought regarding the take off. Some coaches say to roll from the heel to the ball of the foot, lifting with smoothness. Other coaches say to stomp the board vigorously in order to lift. The technique used at Kansas State and the one the author is most familiar with is the one in which you stomp the board. Many coaches have their jumpers stomp the board so they can hear their foot slap the take-off board. The technique used should be decided by the coach and the jumpers. The most important phase is to get as much lift as possible. The lift is aided by lifting the arms and opposite knee high into the air. As the jumper is approaching the board, the last two steps should be relaxed or smoother than all the other steps in order to gather for the spring.

The idea of the gather is outdated by certain coaches. A step adjustment is now a popular concept. Later on in the report several training techniques will be given to use in developing this take off.

Style of Jumping

There are several styles used in long jumping. The two most common styles are the hang style and the hitch kick. The hang style is the one where the jumper just hangs in the air after the take off and then pulls his legs up to land. This is the style used by many high school jumpers. In college most jumpers develop the hitch kick or commonly called running in the

air. Most leading jumpers today use this hitch kick style of jumping. An article written by Ted Runner, Athletic Director, at the University of Redlands, described the style of jumping used by Jerry Proctor, the winner of the NCAA long jump. One point of importance to note was that, "Proctor uses two running steps in the air while Ralph Boston uses three steps in the air."¹ The purpose of this running step is that it is used for balance and control; the more steps a person can get in the air demonstrates how stiff the person is, thus affecting the length of the jump.

There are several ways of developing the run in the air. One way that has been used is to have the jumper hang on a bar and run in bicycle fashion. Also, the jumper can practice on the grass by jogging down the field and then leaping into the air and running in a climbing fashion with the head up. The position of the head is very important in practicing running in the air and in actual jumping. The head and eyes should always be up. The body will always follow the position of the head, when the head and eyes come down, so will the jumper.

The Landing

Many coaches consider the landing the most important phase of the jump, and probably the least amount of instruction is given on the landing. Many coaches feel this phase of the jump is the natural part and spend 90 per cent of the time on other fundamentals.

¹Runner, Ted, Style in the Long Jump, Athletic Journal, Evanston, Illinois, Vol. 50 January, 1970, p. 12.

Men's natural instinct when landing is to land on his feet, similar to the natural instinct of a cat. However, man does not have the balance or flexibility of a cat. In landing with the legs extended, coaches are teaching something quite unnatural. This type of landing with the legs completely extended is referred to as the side swing.

The side swing technique in landing is fairly new and most high school coaches don't teach it. Most jumpers extend the legs, except they just drop their legs so they don't fall back in the pit.

The coaching staff at Los Angeles Valley College at Van Nuys, California, conducted a study of high school and college jumpers using the side swing landing technique and the conventional straight landing into the pit. They found that, "In most cases the jumper could gain at least a foot by using the side swing technique."²

The side swing technique begins when the jumper's heels hit the pit and his body drives forward with one knee bent. The bent knee gives and he drives his body forward as though he were doing toe-touches with a sit-up. The jumper's body revolves around the bent knee and the stiff leg acts as a fulcrum of action as the buttocks skim above the sand and he rotates sideways. The jumper gains the additional distance by rotating around the fulcrum, which is the feet, instead of going over the fulcrum.

There are several training techniques that will help the jumper develop the side swing landing technique. To develop this skill

²Giovinazzo, Nick, Teach Them to Land, Athletic Journal, Vol. 50, January 1970, p. 16.

the jumper should do 10 to 20 standing long jumps every day. The jumper should take off, arch his body like a drawn bow, and then snap to a sitting position in the pit landing on his buttocks with his legs extended. This practice develops the hip swing and teaches the jumper to land with his legs extended and his toes or ankles flexed. When practicing the standing long jump, the jumper should land with one knee stiff and the other knee bent. Practice and more practice is the only way to continue to develop this skill.

On page 10 is Table I a sample progress graph that has been used to record the distance of a long jumper for his sophomore year of competition.

This progress graph is a good way of showing the consistency of your athletes. The chart itself consists of the most likely distances that might be obtained by long jumpers. These are the vertical numbers on the left side of the graph.

The first row of horizontal letters is an abbreviation of the meets attended. The second row of horizontal numbers are the dates of the meets. The third row of horizontal numbers are the temperatures the day of the meet.

On this graph you can record all four years of competition on one graph, thus giving you an indication of the yearly progress made by your jumpers. This type of graph also is a good motivation factor for the athlete, he can see if he is improving or not.

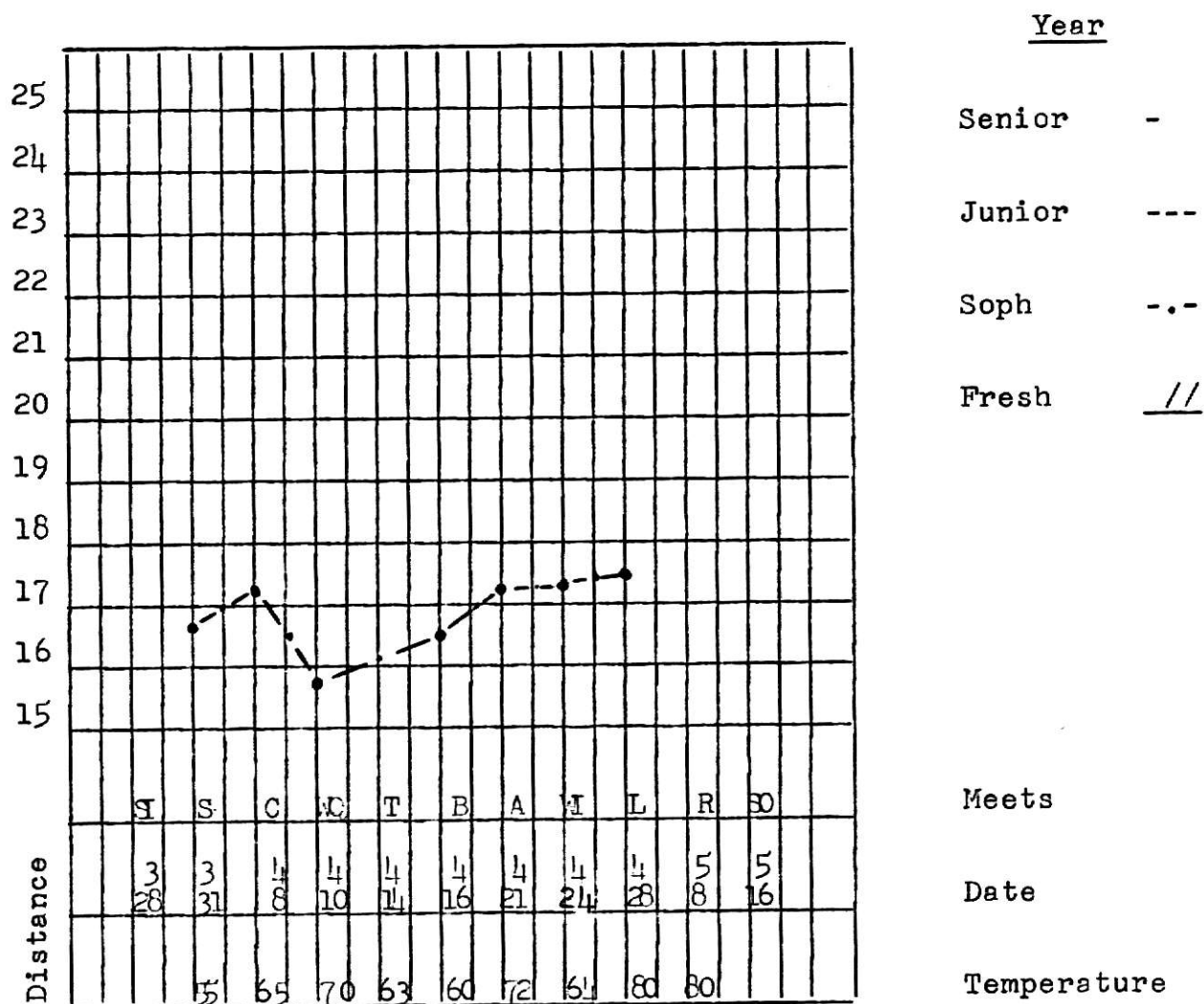
TABLE I

SAMPLE PROGRESS GRAPH FOR LONG JUMPERS

NAME:

EVENT: Long Jump

Wakefield High School



EXPLANATION OF PLATE I

The following illustrations show the body position during the Long Jump:

Fig. 1. During the take off the jumper should be crouched some with head and eyes up.

A hard drive off the board, driving the take-off knee up.

A lift with the arm opposite the take-off knee.

Fig. 2. During the middle of the jump arms and legs should be apart in a long running fashion, lifting with the arm to help maintain balance and control.

Fig. 3. Just before the landing the legs should be extended straight with the body being in a jack knife position, and the arms coming forward to aid the jumper from falling back into the pit.

PLATE I

Fig. 1

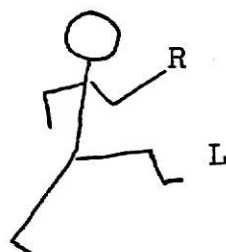


Fig. 2

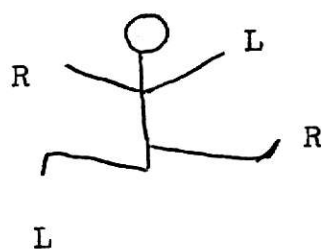


Fig. 3



The triple jump is divided up into three parts: the hop, the step, and the jump.

In this section of the report suggested techniques are presented which will help in competitive evaluation of the triple jump. The relationship of the three parts of the jump will be covered, and the phases of the run will be broken down into the hop phase, the step phase, and the jump. No one part of the total jump should be emphasized to the point where the other segments are appreciably affected. It is important that as the jumper completes one part of the jump, he is in position for the next part of the total effort. The height of the hop and the step must be minimized to maintain horizontal speed for the jump phase. The more height there is at the take off, the less horizontal speed will be maintained for the jump. Take off angles for the three parts of the jump will be shown at the end of this section.

First, in discussing the run, speed is of great importance, but so is position at the take-off board. A jumper should approach the board with controlled speed. The crouch or gather is not emphasized as it is in the long jump, because height on the hop is not desirable. The hips should remain forward and not level as they do in the long jump.

The Hop

While the jumper is in the hop phase, the take-off is forward of the board, and speed is the important factor at this point. The jumpers body weight should be forward so as not to lose too much horizontal speed during the hop phase. A low angle of flight off

the take-off board is important in maintaining this horizontal speed. The jumpers opposite knee should glide forward and not be driven up. If one gets too much height here you are defying gravity thus losing speed. During the hop, the jumper's center of gravity should be only slightly behind the take-off foot as it makes contact with the board. The arms should work alternately as they do in sprinting.

In the flight the jumpers opposite leg, not the take-off leg, should drop back behind the vertical plane of the take-off leg as far as possible, without causing the upper body to lean forward. It should be brought through again during the step phase. The take-off leg should be flexed slightly for balance and in preparation for landing at the conclusion of the hop. The jumpers head and chest should be up, eyes straight ahead, back straight, and weight slightly forward. Both arms should be dropping back behind the vertical plane of his body.

The Step

The step phase of the triple jump is felt by many coaches to be the hardest phase to master, but the jumper who is going to win must develop a step or he will not meet with much success on the college level. During the step phase, the take-off leg should be in the same position it is in the hop. The take-off foot should touch flat with the foot moving backward, leg pulling, before the foot makes contact with the runway. As the take-off foot makes contact with the runway, the knee, not the foot of the opposite leg should drive forward and up to a position even with the

horizontal plane of the jumper's hip. The jumper's foot should be in a flexed position, toes up and directly below the knee. The knee should be brought through high for position and not for added lift. If the knee is driven too high and pulls the hips up, the jumper loses horizontal speed which is the primary factor to maintain throughout the triple jump. The arms should be brought forward and upward for balance and added forward momentum.

The jumper should keep his head and chest high and his weight slightly forward.

When in flight, the jumper's take-off leg should flex slightly and remain back behind his hips. The opposite leg should remain in knee high position, delayed at hip level, until just before landing. In landing coming off the step phase the jumper will land on his heel and often times bruise his heel. To prevent injury, the jumper should wear a heel cup in his shoe to protect his heel. Holding the knee at hip level as long as the jumper can adds considerable distance to the step. Again the foot should be flexed and under the knee. The arms begin dropping back behind the vertical plane of the body.

The Jump

In the jump phase, if speed has been maintained through the first two phases (the hop and the step), the horizontal speed should be sufficient for the concluding phase (the jump). The take-off angle (the height) should be greater for the jump, because horizontal speed is not important at the conclusion of this phase (the final landing).

Some steps in obtaining the lift are as follows:

1. Increase the take-off angle with the take-off leg.
2. The knee of the opposite leg should be driven through high.
3. The jumpers arms should be driven upward.
4. His head and chest should be held high.
5. In order to retain forward speed, it is important for the body weight to glide forward before leg extension begins.

In the flight, if the jumper has good position and speed going into the jump phase, then the hitch kick can be used. For many jumpers the speed at this point is not adequate and the length of time in flight will not enable the jumper to use the hitch kick. The jumper should then use any method available to get his legs extended and his heels high in front of his body.

In landing there are several techniques that can be used. The side swing as described in the long jump section can be employed, or as the feet break the sand, the knees should bend and the body weight should pass forward through the knees.

EXPLANATION OF PLATE II

The following illustrations show the body position during the triple jump.

Fig. 1. The height and angle of each phase of the triple jump are shown as to relationship of each other. The hop and step should be long low jumps with a low degree of take-off angle. The jump phase should be higher with a high degree of take-off angle.

Fig. 2. Figure 2 illustrates the hop take off and the hop landing.

During the hop take off the jumper should:

1. Keep center of gravity low.
2. Glide forward.
3. Alternate arms as when running.

During hop landing the jumper should:

1. Land with weight just a little behind landing foot with knee slightly flexed.
2. Pull back.
3. Arms should be back to gather for step.

Fig. 3. During the step take off the jumper should:

1. Stay low.
2. Drive knee to hip level and hold.
3. Both arms should be forward.

During the step landing jumper should:

1. Have back straight in a semi-sitting position.
2. Knee and foot reach forward the pull back.
3. Arms back to gather for jump.

Fig. 4. During the jump take off the jumper should:

1. Drive up after gliding forward.
2. Drive arms and knee up.
3. Head and eyes up.

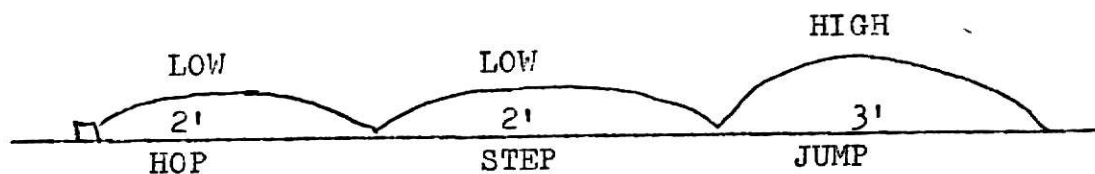
During the jump landing jumper should:

1. Hold feet and legs in an L position.
2. Drive arms back.
3. Bend knee and use side swing when heels hit the sand.

PLATE II

The Run

Fig. 1



Hop Take Off

Fig. 2

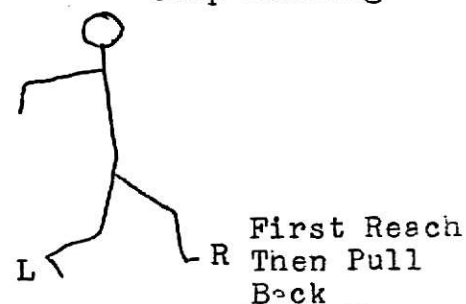
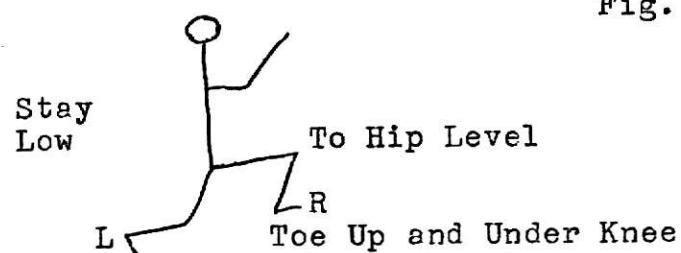
Hop Landing



Step Take Off

Fig. 3

Step Landing



Jump Take Off

Fig. 4

Jump Landing

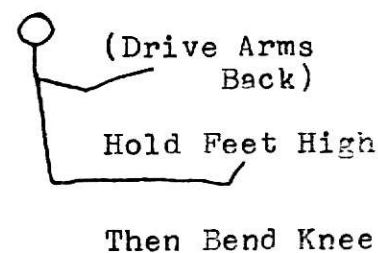
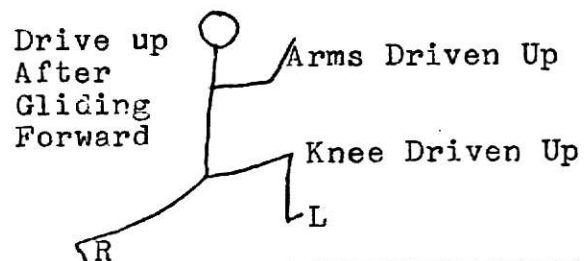


TABLE II
SAMPLE PROGRESS GRAPH FOR TRIPLE JUMPERS

NAME:

EVENT: Triple Jump

Kansas State University

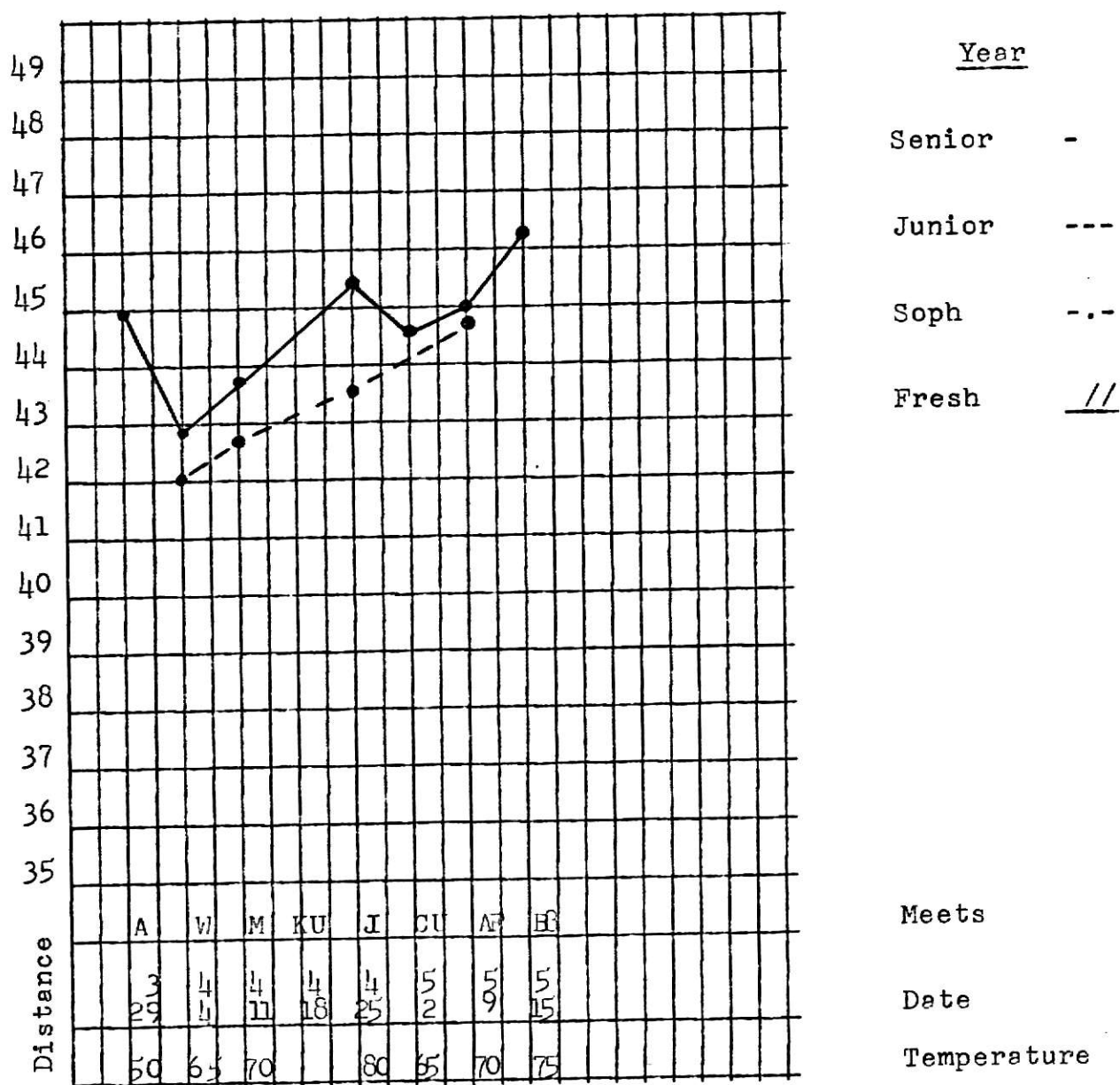


TABLE II is a progress graph showing the distance of a triple jumper during his junior and senior years of competition.

In the high jump there have been two major types of jumping form used the past few years. The oldest and the type used most by high jumpers has been the conventional Straddle Jump. The other type that has gained much support only in recent years has been the Fosbury Flop, made famous by Dick Fosbury, the Olympic High Jump Champion. This section of the report was set up to analyze both of these two jumping styles.

The conventional Straddle Jump or often referred to as the straddle roll has many various varieties, depending on the jumper. The mechanical style has always been much the same.

The approach in the high jump should be determined by the coach and the jumper, it may vary considerably from jumper to jumper. One of the most popular approaches is the seven running step approach. The angle of the approach may also vary with the jumper, but it is usually at an angle of 30 to 50 degrees.

The approach itself should be as relaxed as possible, so that the jumper can reach the cross bar without tension. The approach should be an accelerated run, carefully measured, and the approach speed must be at a controlled tempo at take off. Special emphasis should be placed on a double arm action, with the arms back when the right foot is in contact with the approach area. The hips should begin to settle during the last two strides of the approach. The jumpers last stride of the approach should be low and flat with heel-to-toe action of the left plant foot. His jumping foot is kept in the line of direction of approach. At this point the jumpers upper body mass is in back of his center of gravity, which is essential to get proper body lift at take off.

The body mass passes over the braced left take-off foot. Both arms and the lead leg start forward in a coordination action. This type of action of the lower center mass, lay back action, and initial action of the bent lead leg will enable the jumper to exert as much force as possible downward against the ground. The jumper can apply more force for a longer period of time and get the vertical lift from his body strength.

The arms and legs come up at the same time. The jumper starts the take off with a bent lead leg and shortens the lever in order to get greater speed with his lead leg. As he lifts off the ground he should use a straight leg thus having a longer lever and greater force applied to lifting action for a longer period of time.

The timing of the lead leg and double arm action of the body is very important in the height of lift. The jumper comes off the toes of his jumping foot with the high point of the lead leg placed above the crossbar. Timing must be perfect to exert the greatest amount of force on the ground.

The bar is cleared by maintaining a wide spread of the thighs with a spin roll over the bar. The right arm should reach up over the bar as the lead leg goes up. The left arm should be tucked in close to the body. The downward action of the right arm will quicken the spin roll, thus enabling the left side of the body to clearly roll over the bar. The toes should be kept in an upward position to complete the roll over the crossbar. The trail leg should remain in a bent position, with the toe pointed upward.

If the jumper has had good transfer of horizontal speed approach, to vertical lift at the take off he should land in

the center of the pit on his back.

Surprising as it may seem to many high jump experts, close analysis of the Fosbury Flop is not only scientifically sound, but it is mechanically a more efficient high jumping style than any of the various varieties of the straddle roll.

The flop allows for additional energy to be expended on upward lift, provides a very efficient lay out position, and requires only minor technique changes as the crossbar is raised.

"The two primary factors which contribute to successful high jumping, no matter what the style, are the take-off, which is said to contribute 90 per cent of the height obtained, and the lay out."³

The Take Off

In all efficient high jumping the body rotation which turns the jumper as he clears the bar must be created while the jumper is still on the ground. Rotation around an axis cannot be initiated in the air.

There are three ways in which this rotation may be started:

1. Through eccentric thrust.
2. By checking linear motion.
3. Through transference of angular momentum.

Eccentric thrust is the means for creating body rotation over the crossbar in all straddle roll jumping. It is the upward force applied through the body at take off, but the line of force

³Ecker, Tom, The Fosbury Flop, Athletic Journal, April, 1969, p. 67-71.

does not pass directly through the bodies center of gravity. In order for straddle jumpers to get the rotation necessary for lay-out, the jumper must drive upward from the take-off foot along a line that is not through his center of gravity. The farther away from the center of gravity this imaginary line is, the more rotation in the jump, and the less height achieved in the jump.

Check linear motion or motion in a straight line is when an object is interrupted at one end of the object, the other end continues ahead but at an increased speed. During the flop, the jumper checks his linear motion in order to get frontal rotation which is rotation around an axis through his hips. When his right foot is planted for take off, his upper body continues to travel forward, giving his entire body the rotation needed for achieving his lay-out position during bar clearance, but his "Height-getting" ability is not checked appreciably.

Transfer of angular momentum is also used in the Fosbury Flop, in order to get the longitudinal rotation, which is rotation around an axis through the length of the jumper's body. This principle enables the jumper to turn over on his back. He transfers momentum by swinging his leading knee upward and across his body during take off. The longitudinal rotation created at that time is transferred from the leading knee to his entire body, giving him approximately 90 degrees of longitudinal rotation from take off to landing.

The Lay-Out

The ideal lay-out position, no matter what the jumping style, is one in which the largest possible amount of the jumper's body mass is below the bar during bar clearance.

Since one doesn't bend backwards, analysts have been surprised at the large amount of mass that is below the bar during Fosbury's backward clearance. His center of gravity passes very close to the bar, meaning that his clearance style is probably as good as the best traditional methods of bar clearance.

Parabolic Curve

The moment a jumper leaves the ground, his entire flight path has been determined. The combination of forward-upward lift and gravity causes the jumper's center of gravity to follow a perfect regular curve called a parabola. The depth, or distance from take off to landing, of this curve is determined by the approach speed of the jumper; the height of the curve is determined by the jumper's take-off spring. No matter how efficient the jumper's lay-out may be, it is worthless if the take-off has not been efficient. It will probably take a great deal of time for most jumpers to learn and perfect the flop. Some may never master it.

EXPLANATION OF PLATE III

The following illustrations are an explanation of the conventional straddle jump:

- Fig. 1. The last step of the approach.
1. Hips should settle back.
 2. Both arms back.
 3. Jumping foot kept in line of approach.
- Fig. 2. The Take Off.
1. Heel-to-toe action with left foot.
 2. Straight leg action.
 3. Both arms lift.
- Fig. 3. The roll over the bar.
1. Right arm action should pull weight over bar.
 2. Bent trail leg.
 3. Left arm tucked close to body.

PLATE III

Fig. 1 The Last Step of the Approach

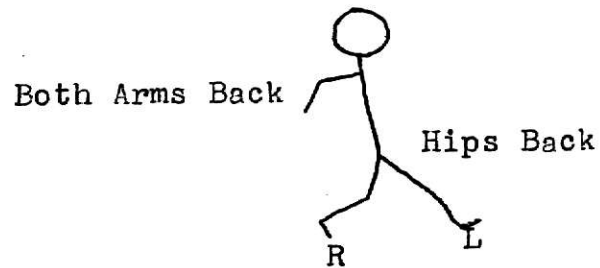


Fig. 2 The Take Off

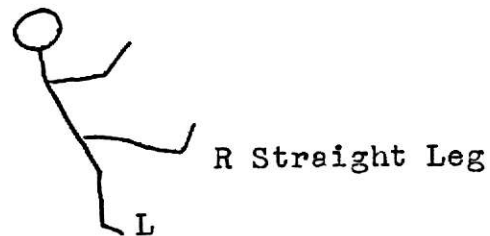
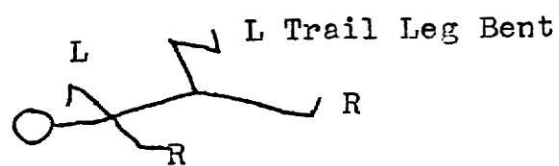


Fig. 3 The Roll Over the Bar



EXPLANATION OF PLATE IV

The following illustrations are an explanation of the Fosbury Flop:

- Fig. 1. The Take Off.
1. Slight backward lean.
 2. Left knee and right arm lift at the same time.
 3. Knee slightly flexed.

- Fig. 2. The Lay-Out.
1. Legs draped.
 2. Arms straight to side of body.
 3. Back arched.
 4. Head up.

PLATE IV

Fig. 1 The Take Off

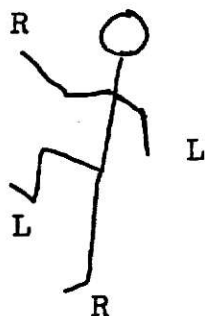


Fig. 2 The Lay-Out

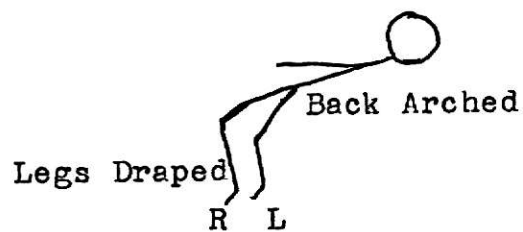


TABLE III
SAMPLE PROGRESS GRAPH FOR HIGH JUMPERS

NAME:

EVENT: High Jump

Wakefield High School

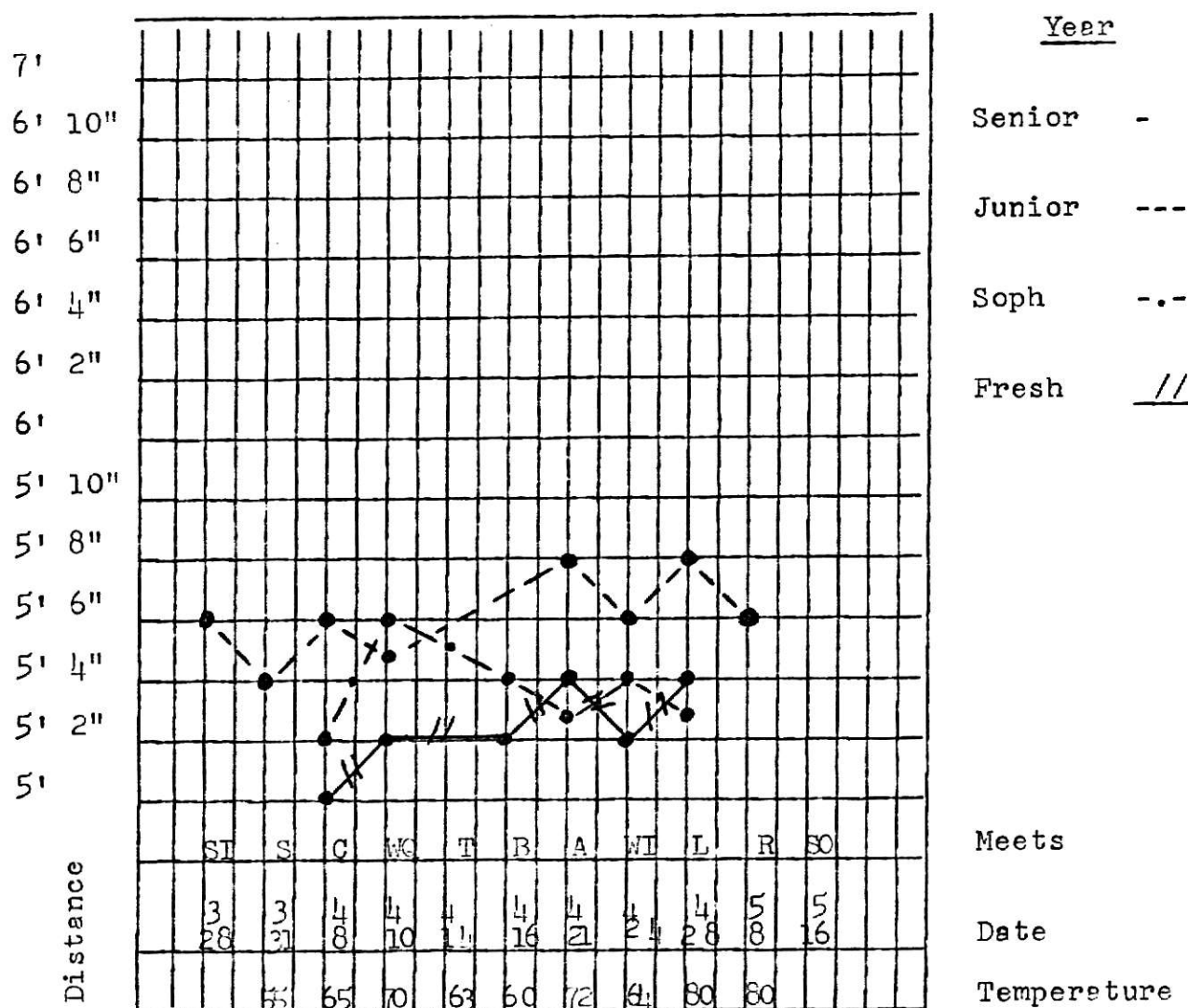


TABLE III is a progress graph showing the heights of a high jumper during his freshman, sophomore, and junior years of competition

The following section discusses training techniques for jumpers. There should be two distinct training periods for jumpers. They are preseason and competitive season. The purpose in this section of the report was not to set up complete work-out schedules for jumpers (for this will vary with the coach), but to give some training and work-out techniques that have been proven to be very useful.

First, during pre-season there should be a greater emphasis placed on developing the body strength, by the use of running work-outs and weight training. In the first part of pre-season there should be little emphasis on event work. Most of the work-outs should involve running over distance such as a cross country runner would do. Also, playing games such as touch football helps to get back into shape.

Two to three days a week, depending on the weather, work-outs would be on the track. These work-outs should be striding work-outs, hardly ever full speed. They should vary from:

1. Step downs, in which you begin with a distance and work down such as 330-220-110= 1 Set. The first part of the season there should be a smaller number of sets, such as 2 the first week, and increase 1 set per week up to 5 or 6 sets.

2. Six to eight 220's. This type of work-out would consist of 220's with a fairly long interval and not too fast of time. In pre-season times should be 28 to 32 with 3 or 4 minute interval.

3. 20 to 30 110's. This work out should be a little bit faster. One hundred and tens should be at $\frac{3}{4}$ speed. Interval

would be to walk across the end zone on the football field. At least three days per week in pre-season, much emphasis was placed on weight work-outs. The work-outs should consist of the following stations as shown on Table IV. The first few weeks of the weight training program are set up to stress repetition and to get the muscles back into shape. After the jumpers get into shape, the weight work-outs should be set up to develop strength and endurance.

TABLE IV

WEIGHT WORK OUT CHART

First few weeks all work-outs done with weight athlete can handle.

Bench Press	2 Sets of 10	Leg Machine (Develop Thighs)	2 Sets of 10
Military Press	2 Sets of 10		
Squats	2 Sets of 10	Sit Ups	2 Sets of Maximum
Heel Rises	2 Sets of 10	Leg Lifts	2 Sets of 15

After jumpers become accustomed to the weights, work-outs would change to more weight, less repetition and the weight should increase each week or so.

EXAMPLE

Bench Press	1 Set of 10 - 145 1 Set of 5 - 160 1 Set of 3 - 175	Heel Rises	1 Set of 10 - 25 1 Set of 5 - 27 1 Set of 3 - 30
Military Press	1 Set of 10 - 125 1 Set of 5 - 145 1 Set of 3 - 165	Sit Ups	2 Sets of Maximum
Squats	1 Set of 10 - 250 1 Set of 5 - 275 1 Set of 3 - 300	Leg Lifts	2 Sets of 15

This schedule should be followed until competitive season and then weight work-outs should change to twice a week and the amount of weight being lifted should not change much once the competitive season starts, because the change in weight would change the muscle development of the jumper. Thus, it could foul up his step, approach, and jumping technique.

Other training techniques that are very useful to jumpers are:

1. Stadium Step (running and hopping up steps on one leg).
2. Hopping length of football field. Often times with weight jackets and ankle weights on.
3. Running over hurdles will help develop stride and rhythm for jumpers.

As the competitive season gets closer and during the competitive season more emphasis should be placed on less repetitions and increased speed. In order to be a good jumper the jumper must develop as much speed as possible; thus during the competitive season all work-outs should:

1. Decrease in repetitions.
2. Decrease interval.
3. Increase speed.

Also, as the competitive season gets closer, much more work needs to be done on the various phases of the event. Care should be taken that the jumpers don't jump for distance or height too much in that many jumpers become stale or go into a slump in the middle of the competitive season. The coach should develop work-outs that will enable the jumpers to peek out for the championship meets.

Table five on the following page is a chart that can be used to set up track work-outs. It consists of twenty-one types of work-outs that can be used. The coach may make up a work-out by listing the numbers and letters that correspond to the work he needs done during the work-out. An example of a daily work-out schedule that may be devised from Table five follows:

1. Jog - d. Mile
2. Warm -Up
15. Repeat 220's - g. 10 times 33 sec.
5. Stadiums - a. - 10 sets
4. Weights

TABLE V
KEY FOR ALL TRACK WORK-OUTS

1. Jog	12. Relay Work	19. Repeat 880's
a. 440 Yds.		a. 2:40.0
b. 880 Yds.	13. Pre-Meet Work Out	b. 2:36.0
c. 1320 Yds.		c. 2:30.0
d. Mile	14. Repeat 110's	d. 2:26.0
	a. 20 Sec.	e. 2:20.0
2. Warm-Up: Stretch and Calisthenics	b. 18 Sec.	f. 2:16.0
	c. 16 Sec.	g. 2:12.0
3. Body Building Exercises	d. 14 Sec.	x. Specific Time
	e. Specific Time	
4. Weight-Training	15. Repeat 220's	20. Repeat 1320's
	a. 40 Sec.	a. 4:00.0
5. Stadiums: Sets of	b. 39 Sec.	b. 3:54.0
a. 10	c. 37 Sec.	c. 3:45.0
b. 15	d. 36 Sec.	d. 3:39.0
c. 20	e. 35 Sec.	e. 3:30.0
d. 25	f. 34 Sec.	f. 3:24.0
	g. 33 Sec.	g. 3:18.0
6. Interval or Fun Running Frequent Bursts	x. Specific Time	X. Specific Time
	16. Repeat 330's	
7. Wind Sprints	a. 60.0 Sec.	21. Fartleack
	b. 58.5 Sec.	a. 3 Miles
8. Starts	c. 56.25 Sec.	b. 6 Miles
a. 30--50 Yds.	d. 54.75 Sec.	c. 12 Miles
b. Over HH & LH	e. 52.5 Sec.	x. Specific Time or Distance
	f. 50.0 Sec.	
9. Low Hurdles	g. 48.0 Sec.	
a. 120 LH	x. Specific Time	
b. 180 LH		
c. 220 LH	17. Repeat 440's	
	a. 80.0 Sec.--5:20 Mile	
10. High Hurdles	b. 78.0 Sec.--5:12 Mile	
a. 70 HH	c. 75.0 Sec.--5:00 Mile	
b. 80 HH	d. 73.0 Sec.--4:52 Mile	
c. 120 HH	e. 70.0 Sec.--4:40 Mile	
d. 130 HH	f. 68.0 Sec.--4:32 Mile	
	g. 66.0 Sec.--4:24 Mile	
	x. Specific Time	
11. Sprints	18. Repeat 660's	
a. 30 Yds.	a. 2:00.0	e. 1:45.0
b. 40 Yds.	b. 1:57.0	f. 1:42.0
c. 50 Yds.	c. 1:52.5	g. 1:39.0
d. 60 Yds.	d. 1:49.5	x. Specific Time
e. 100 Yds.		

CONCLUSION

This and other studies seem to indicate that the correct teaching and execution of jumping techniques will probably provide the soundest basis for improvement and success in the long jump, triple jump, and high jump. Perhaps, the best conclusion to make is that success depends upon more than just going out and using one's natural ability. Attitudes, well-kept records, and correct techniques seem to have a definite correlation to success in the jumping events, in all track events, and in life.

After a careful examination of proper techniques being used by leading jumpers in track and field, it was concluded that track records should continue to be broken if new and improved techniques are discovered and used by future track athletes.

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A STUDY OF HOW TO DEVELOP ATHLETES
IN THE JUMPING EVENTS IN TRACK AND FIELD

by

HARRY L. KITCHENER

B.S., Kansas State University, 1967

AN ABSTRACT OF A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Physical Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1970

The purpose of this report was to present new and improved techniques in the long jump, triple jump, and high jump by illustrating some sensible and useful training methods that either high school or college track and field coaches could use.

The major portion of the findings for the proper jumping techniques were gathered from readings done over the past years and from the involvement of participating and coaching track and field.

A considerable amount of this report came from the track program instituted for and followed by the field event track men at Kansas State University during the years 1963 to 1967.

One of the most up-to-date sources was that of recent magazine articles written by some of the outstanding leaders in track and field. Probably the best source of articles written on all phases of athletics was the Athletic Journals.

Information passed out and discussed at coaching clinics and coaching schools was very useful in comprising this report.

The report was divided into four separate categories:

1. The techniques of the long jump.
2. The techniques of the triple jump.
3. The techniques of the two most popular high jump styles:
 - a. The conventional Straddle Jump.
 - b. The Fosbury Flop.
4. Useful and proven training methods which was discussed in three areas.
 - a. Running work-outs.
 - b. Weight training.
 - c. Event work.

Each category in this report was broken down into the various phases of the jump: Coaches should teach the parts of each type of jump and then put the parts together to form a whole event, because this is one of the better methods of teaching fundamentals. A measure of the knowledge of the event and the amount of training will be evident on the actual day of competition.

Several charts and tables were used in the report to give some useful illustrations that can be implemented in a Track and Field Program.

A complete work-out schedule for jumpers was not included in the report since most coaches will vary their own work-outs for the conditions they have available. Several training methods that have been tried and used were given to aid the jumper in his perfection of his event.

An examination of proper jumping and training techniques will enable athletes to be more competitive and meet with more success. Through success, athletes tend to develop attitudes which are important in shaping their lives.