A HISTORY OF FIBERGLASS POLE VAULTING

By

AUBREY CHARLES DOOLEY

Bachelor of Science

Oklahoma State University

Stillwater, Oklahoma

1961

Submitted to the Faculty of the Graduate College of
the Oklahoma State University
in partial fulfillment of the requirements
for the degree of
MASTER OF SCIENCE
July, 1966

A HISTORY OF FIBERGLASS POLE VAULTING

Thesis Approved:

Orin B. Harrison
Thesis Adviser

Allyn P. Warner

J. S. Bonnell
Dean of the Graduate College

PREFACE

The author recalls the beginning of his pole vaulting career as starting in the third grade at Coats, Kansas, when one day my teacher's boy friend was visiting school. He told the third grade class, after recess, and we were back in our classroom with its fourteen foot ceilings, that he had pole vaulted about as high as the ceiling.

The story stayed with me and was recalled a few years later when I was in the sixth grade. My parents at that time were living on a farm near Burlington, Oklahoma. One day they received a rug they had ordered and on the inside to keep the rug straight was a bamboo pole. The pole gave me an idea and I began to work on the project. I went behind the barn, dug up the dirt, placed two boards with nails in them in the ground for standards, used a cane fishing pole for a crossbar and dug a small hole in the ground for a planting box and began vaulting.

In the seventh grade one of my teachers was conducting a recreation period on track. We were asked to try several events. I soon came to the conclusion that I was not fast enough to win the short races nor strong enough to win the shot put or discus events. From observing the high school pole vaulters and through past experience, I decided that this was the event for me. That year I tied for third in the county track meet held at Cherokee, Oklahoma.

My parents moved to Braman, Oklahoma, where I continued each year to pole vault in the Spring. My junior year in high school was one of

regret as far as vaulting was concerned until the last track meet of the season. I had placed second in almost every meet that year until the Cowboy Relays held at Stillwater, Oklahoma, in 1955. I was determined to win that meet.

I recall the wind blowing so hard at the beginning of the track meet that both vaulting standards were blown over and onto the track. My previous best vault was 11". My chief competitor had gone 11'6".

That day after four hours of vaulting, I found myself winner of the event with a new meet and state record. I had vaulted 13'2¼" to erase the old mark of 12'6" set twenty-five years earlier. This was an important day in my life because it opened the door to my education as I was offered a scholarship after my senior year in high school to attend Oklahoma A and M College, now Oklahoma State University.

The vault mark in high school was established while using a swedish steel vaulting pole which I continued to use during my freshman year at college. However, I had heard about the accomplishment of Jim Brewer who had set a new national high school record at 15'1/8" using a fiberglass vaulting pole.

During my sophomore year in college, Coach Ralph Higgins ordered a fiberglass pole. I began working with it and found it difficult to control. When it would bend it felt like it was going to break. I did not get discouraged because I believed in the pole and felt it was the answer to attaining a greater height in the pole vault event.

I was able to vault 15'5" with the fiberglass pole for a personal best, but I knew that this pole could help set the world record. I attempted to talk various leading vaulters into switching poles, but some had already tried the fiberglass pole and did not like the bend,

nor would they jeopardize their present status.

While in the Marine Corps in 1962, John Uelses approached me and asked that I teach him how to use the fiberglass pole. This I did and the result was the first 16' vault in history.

Today's marks speak for themselves. Continued improvement of equipment, knowledge and coaching techniques will make the vaulting records continue to climb.

The author gratefuly acknowledges the assistance from Mr. Herbert Jenks of the Browning Arms Company and Mr. Virgil Jackson, who have given of their time and effort to verify facts and other data for this manuscript. Indebtedness is also acknowledged to Dr. A. B. Harrison for his valuable guidance, to Coach Ralph Higgins for the loan of materials and his personal guidance through the years, and to my wife, Patsy Gene, for her assistance in typing this manuscript. To the many people who answered the questionnaires, thanks is also given.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Pole vaulting is nothing new; however, the implements used and the surroundings have changed.

> "Boo" Morcom was in England in 1958 competing in the invitational track meet. The day before the meet "Boo" and a friend of his, John Grey, went out into the country side. They met an 84-year-old man who claimed to be one of the original pole vaulters of his country. John invited him to go with them to the track meet. They said that as the old man went into the stadium, he asked the question? [sic] "Where is the brook that you are going to jump over?" John said, "There's no brook." John then ran down the run way, jumped into the air, vaulted over the bar and landed in the pit. The old man exclaimed, "Boy, pole vaulting has changed a lot since my day."[1]

We should be grateful these changes take place, but, as can be seen with the fiberglass pole, changes make for progress, and progress causes controversy.[2,3] As Cornelius Warmerdam expressed it,

> Vaulting's the same with bamboo, steel or fiberglass. It's never the pole. It's how you use it. How can they legislate against progress?[4]

Truer words were never spoken, but it is turning out that vaulting

---

[1]R. Morcom, "Pole Vaulting," National Collegiate Track Coaches Association, Clinic Notes, (1962), p. 85.

[2]D. Bragg, "The 16-Foot Pole Vault is a Fraud," All Sports Magazine, (December, 1962), p. 34.

[3]R. Richards, "Fiberglass Poles are Killing Pole Vaulting," Complete Sports, (January, 1963), p. 20.

[4]C. Warmerdam, "A Pole is a Pole is a ...," Newsweek, (February, 1962), p. 89.

is not completely the same with fiberglass. The International Amateur Athletic Federation did not legislate against the pole because of its own rule which states,

> The pole may be of any material and of any length or diameter, but the basic surface of the metal, where metal is used, must be smooth.[5]

The fiberglass pole, now used by approximately 100 percent of the top United States competitors, was used in international competition as long as thirteen years ago. Bob Mathias won the decathlon at the 1952 Olympics for the United States, and George Roubanis of Greece took third in the 1956 Olympics; both used fiberglass poles. At no time was any international action considered.

Much has been done to make pole vaulting a progressive event; much can still be done. There is a need for a mechanical analysis of the fiberglass pole vault, such as Ganslen did for the metal pole,[6] which would show the variances in methods and styles used by the different vaulters.

---

[5]C. Warmerdam, "A Pole is a Pole is a ...," Newsweek, (February, 1962), p. 89.

[6]R. V. Ganslen, Mechanics of the Pole Vault, (St. Louis, Missouri, 1963).

CHAPTER II

STATEMENT OF PROBLEM

This study was initiated through a desire to leave to posterity a clear and chronological understanding of the history of fiberglass pole vaulting. This new material "Fiberglass" is one of the causative factors which has changed our pole vaulting technique of today and has contributed a great deal to the setting of numerous vaulting records.

Many types of vaulting poles have been used, such as wood, bamboo, aluminum, and steel. None, however, has caused so much controversy or change as the fiberglass pole. Some of the changes caused by this pole have been in the landing pit, the pole vault standards, and the pole vault planting box.

Basically, the problem was to determine who developed the fiberglass vaulting pole. How did such a pole get its start? Who were the men contributing to its success? Why has this pole been successful and what does it hold for the future of track and field?

The purpose of this study was to answer these questions and provide a factual background for future investigators of pole vaulting. A subproblem was to note the changes in the pole vault event caused by the fiberglass pole.

Limitations of the Study

Most of the necessary materials were present here in the United States; however, all sources of foreign material were not available, nor

could they be obtained without great expense.

It is recognized that the writer's own experience in vaulting may have affected the contents of this manuscript.

Definition of Terms

1. Fiber-Fibre: A thread or thread-like structure or object. Collectively, any tough substance composed of thread-like tissue, especially when capable of being spun and woven.

2. Fiberglas: A trade-mark applied to fine, flexible glass fibers made by attenuating molten glass streams flowing from small holes, used especially for making textile fabrics and, in cotton-like felted masses, for heat or sound insulation. This term is basically used in industry and manufacturing circles.

3. Fiberglass: A modern term denoting a specific type of fiberglas material used in making fiberglass vaulting poles. This term is used when referring to pole vaulters who use a vaulting pole made of this material.

4. Technique: The method or the details of procedure essential to expertness of execution in any field. In vaulting with fiberglass vaulting poles the technique involved is in knowing how to utilize the pole which thus causes some changes in the execution of the pole vault event.

5. Laminating: To make (a material) by bonding together superimposed layers of fabric, impregnated with a resinoid, by simultaneous application of heat and pressure, into a dense, tough, homogeneous solid.

6. Maximum Controllable Speed: That speed which a runner (pole vaulter) is capable of maintaining through a set distance with control and dependability.

7. Sky Pole: A trade name given to the fiberglass vaulting pole produced by Browning Silaflex, a subsidiary of the Browning Arms Company of Costa Mesa, California.

8. Hitch Kick: A two-leg action in which the lead leg swings forward, back, and then forcefully forward and upward again until the vaulter has crossed the crossbar. This is sometimes thought of as running in mid air for three strides.

9. Rock Back: A movement performed by the vaulter in order to maintain position during the swinging phase of the vault and then at the finish of the pulling phase of the vault which enables the vaulter to get his feet and lower torso elevated to the required height for the handstand and push off phase of the vault.

10. Push-Off: A common term used for this phase of the vault. A more correct term would be a "push-up" indicating that the vaulter's action is one of an upward nature such as would be in the performance of a hand stand push up when begun on the upward movement. This movement should be done whenever the pole reaches a vertical point and is the most difficult phase of the vault. The distance of the push-off can be measured between the top hand hold of the vaulter while holding onto the vaulting pole and the height of the crossbar.

CHAPTER III

PROCEDURE

This study was made through library research, questionnaires, personal correspondence and personal interviews. Much of the enclosed data was available through the use of Coach Ralph Higgins' personal library. Questionnaires were sent to various manufacturers, athletes and coaches. Letters of a specific nature were used to collect data from key people. Personal interviews were conducted with such people as Herbert Jenks and Coach Ralph Higgins.

As questions were asked and answered, the next procedure was to put these answers into a logical sequence of chronological order. The following chapter is the result of this report.

CHAPTER IV

HISTORY

The fiberglass pole for vaulting originated in Costa Mesa, California. It was in August of 1949, when a man named Herbert Jenks, partner and manager at Costa Mesa's Pacific Laminates Company originated the fiberglass pole. This company was in the early stages of experimentation in fiberglass products. Jenks, a research chemist had developed a phenolic resin bonding material while he was with Consolidated Aircraft during World War II, a material used in the manufacture of fiberglass hot air ducts.

Associates of his at Consolidated had often observed that the laminated fiberglass with which they were working might make good fishing rod material. In January of 1948, Jenks with three partners opened Pacific Laminates in Orange County, California. They obtained a license from Consolidated to use the resin which Jenks had developed and began manufacturing fiberglass fishing rods. It was not long before the company expanded to the point where it needed new quarters, which explains the move to Costa Mesa.

The company also decided to make another product, "outriggers", the poles rigged on trollers to hook albacore and other big game fish. But perhaps the most important development was the manufacture and distribution of glass vaulting poles.

Jenks explained to the writer in a letter, that he was experimenting with tubular fiberglass fishing rods and conceived the idea of

placing two tuna-jack fishing rods together, thus making a pole long enough for vaulting.[1] This pole was given to his wife's cousin, Bob Meyers, who used it while attending high school in Van Nuys, California, in 1949. Meyers did not achieve any outstanding feats with this new pole. Jenks, however, did not get discouraged.

Virgil Jackson, who coached Bob Mathias at Tulare High School, had been invited to speak at the Costa Mesa Wiseman's Club of the Y.M.C.A. After his address, he was swapping sports yarns with some of the "Y" members, one of whom was Herb Jenks. The young Pacific Laminates manager fell naturally into a discussion of his glass fishing rods and how they were prepared. The virtues of laminated fiberglass sounded to Jackson like a description of the material for a vaulting "dream pole". He questioned Jenks further and out of the exchange came the agreement to make what was the first actual fiberglass vaulting pole.

Jackson in 1950 became a full fledged member of the Pacific Laminates organization, responsible for the development of the "Sky Pole", a name he coined and established as the trade mark of the original fiberglass pole. The price of the original poles was set from $34.75 to $38.75 for one of the three models, each of which was manufactured in six different flexions.

The vaulting pole was hollow and had a rich brown color with a polished wood appearance. The resin which binds the layers of glass cloth gave the pole this color.[2] The pole weighed four and one half pounds.

---

[1]Personal correspondence from Mr. Herbert Jenks, November 3, 1965.

[2]Newport-Balboa Press, July 13, 1950.

A fine vaulter, Bobby Smith, was given a sample pole to use. Smith was attending San Diego State College at the time. The Tribune Sun reported the following:

> A 15-foot pole vault, long considered the exclusive possession of Cornelius Warmerdam, will be attained probably next season by State College's Bobby Smith.
>
> That is the word from Aztec Track Coach Charles "Choc" Sportman. Added experience and use of a newly developed, light weight, spun glass pole will carry Bobby to the magic height, according to Sportman.
>
> The blond, slightly built, 20-year-old Aztec junior reached 14'3" last season and easily has been clearing 13'6" with the new pole in informal workouts this year.
>
> A 15-foot vault once was rated as unattainable as a 4-minute mile until Warmerdam came along to clear 15'7-3/4" for a world's record. However, no one, before or since, has been able to raise himself out of the 14-foot plus class.
>
> Smith, who won the N.C.A.A. last year, may continue his bid for national prominence in the big eastern indoor meet this winter, Sportman said. Negotiations are under way now for his appearance there.
>
> Spun glass poles, which are being used experimentally by a handful of vaulters including Smith, are only half as heavy as aluminum. They also have more snap and appear to be more durable than the conventional aluminum and bamboo poles.[3]

Some success with the use of the new pole was dramatized on June 30, 1950, when Bob Mathias, Tulare High School's fine athlete and Olympic Decathlon winner of 1948 broke the world's decathlon record with 8,042 points. His improvement in the pole vault, using the glass stick, figured prominently in the triumph. The best he could do with the old pole was 11'6". He soared 13'3/4" when boosted by the new "Sky Pole" which was given to him by his former coach, Virgil Jackson.[4]

Other trackmen had reported success. Dick McDonald of Wilson High School in Long Beach, California, upped his mark from 11'6" to 13'7". As with the fishing rods, the light weight, the strength, and the

---

[3]The Tribune Sun, San Diego, December 22, 1949.

[4]Newport-Balboa Press, July 13, 1950.

flexion of the pole was showing its value.

In April, 1950, "Dutch" Warmerdam was quoted as saying, "Fiberglass would be outlawed next year,"[5] which typified the inward defense mechanisms of vaulters who had had success with the earlier variety of poles. Warmerdam was the world record holder at that time. He used a bamboo pole. Later, we will see that he changed his mind about the pole.

The use of the pole, however, hit a lag between 1950 and 1957. Evidently the publicity given the pole had not produced the confidence needed for wide acceptance by the coaches or athletes. Something needed to be done.

Jenks recalled that his company decided to concentrate on the high school level.[6] Coach Vernon Wolfe, now at the University of Southern California, was mentor at North Phoenix High School where he had several potentially great vaulters who started using the fiberglass pole. One vaulter, Jim Brewer, stood out among the rest in 1957 when he vaulted to a new high school interscholastic record of 15'1/8".[7] Brewer's teammate, George Davies, was later to come on and break the world record; however, Davies was not in the limelight at this time due to the big success of Brewer.

Others began using the fiberglass pole, but with little success. Brewer had graduated and was now attending the University of Southern California. Brewer, like some athletes, never really attained the heights he might have.

---

[6]Personal correspondence from Mr. Herbert Jenks, October 8, 1965.

[7]Track and Field Rules, National Federation of State High School Athletic Association, Chicago, Illinois, 1958, p. 51.

It was not until 1958, that the writer obtained his first fiberglass pole while a sophomore at Oklahoma State University. Under the direction of Coach Ralph Higgins, that year became an eventful one as it took much practice and learning to adjust to this new way of vaulting. The term "new" referred to the use of the pole itself; basically, the technique used for one pole was the same as with another, but there were changes to be made, and these took time to develop.

One of the earliest discoveries concerning fiberglass vaulting was that it was like swinging on a "wet noodle" for a moment. Then when the pole reached a ninety-degree bend or better, it sprang back to a vertical position, becoming a stabilizer from which the vaulter launched himself.

A problem arose in deciding how to control this great bend. How could this flexible pole be used to convert the energies of speed and strength into usable power? It was in 1959 that the answer came to the writer through a trial and error procedure. The speed and strength was energy and power put into the pole by the vaulters own body speed, weight, and muscle force. In order to use this power, one had to learn to wait for it. As the pole bends to its required degree, as determined by the vaulter, the energy placed in the pole was then returned to the vaulter only if he waited to receive it and was in a position to do so.

That was the easiest problem to solve. Previous vaulters had placed the hands together, but it was found that by using a wider handhold, that the pole could be better stabilized. This also gave an added impetus for the push-off phase of the vault.

The sight of this new vaulting style was awesome to spectators.

The writer recalls not placing at a track meet in Modesto, California, because the crowd was expressing their excitement with "ooo's," "aaahhh's," and screams at seeing the fiberglass pole bend to an approximate ninety-degrees. The steel poles had been in domination for some fifteen years and did not bend enough to catch the spectator's eye. Today, the sight of a fiberglass pole bending seems commonplace.

In 1959, the writer achieved his best record of 15'5",[8] just 3¼" off the American record of 15'8¼", held by Bob Gutowski.[9] This mark was achieved in a dual track meet against Oklahoma University at Norman, Oklahoma, on May 19, 1959. In this meet an example was given as to the importance of the height of the vaulter. There were two steel pole vaulters, Jim Graham and J. D. Martin, against, so to speak, one fiberglass vaulter, the writer. Both steel pole vaulters were over 6'4" tall, weighing approximately 185 pounds each, compared to the fiberglass vaulter of 5'11" tall and weighing 160 pounds.[10] This factor was important in order to illustrate the reach the tall vaulter had over the shorter vaulter, in this case approximately 12".

Theoretically, the taller vaulter should be able to vault 12" higher than the shorter vaulter depending, of course, on varying ability. The fiberglass pole became another important factor here. Because of the fiberglass pole's flexibility the shorter vaulter was able to hold as high on the pole as the taller vaulters. At this phase of vaulting the handholds were approximately 13'6".

---

[8]Track and Field Guide, National Collegiate Athletic Bureau, New York, 1960, p. 41.

[9]Ibid., p. 71.

[10]The Daily Oklahoman, May 20, 1959.

Again, because of the flexibility of the pole, the vaulter utilizing the fiberglass pole did not necessarily have to be as fast as the taller vaulter. The pole absorbs the power placed into it by the vaulter through his speed and strength. The fiberglass pole would return this power to the vaulter more readily than the steel pole, thus enabling the fiberglass vaulter to reach his apex over the crossbar.

An example of a slow vaulter successfully utilizing the fiberglass pole was George Davies. Davies was an Oklahoma State University track star who could run the hundred-yard dash in 10.8. He was 6'3" tall and weighed 195 pounds. He broke the world's record in the pole vault on May 20, 1961, using a fiberglass Sky Pole with a vault of 15'10¼".[11] He made this height mainly because of his size rather than his speed. He probably would have gone on to be the first sixteen foot vaulter had he more speed for his vault. Due to personal interests, Davies did not complete his schooling.

In order to give an idea of what could be done if a vaulter ever does utilize height, weight, speed and strength, let us compare two successful vaulters: Ron Morris, a former California vaulter who has utilized both steel and fiberglass poles and Fred Hansen, the former Rice University star. Morris achieved a maximum push-off of 3'6" on a metal pole. When Hansen vaulted 17'4" his push-off was only 3'. This indicates that it would have been possible for Hansen, with his fiberglass pole, his physical build, speed and hand grip, to have vaulted 17'10" had he achieved the same perfection of timing as Morris. Following this same line of thinking, had Hansen been able to increase his

---

[11] Track and Field News, June, 1961, pp. 1,4.

hand grip and his speed and possibly through the use of a different pole, he should have achieved a height greater than 17'10".

Other factors that enter into this conquest of greater height are the lighter weight poles which allow the vaulter to have maximum speed down the runway, the pole bending in the direction of the vaulter's movement which does not abruptly change into a different direction as was true with a metal pole, and mastery of a properly timed push-off which would give the vaulter support for his push-off. It should be possible to perfect a vault with the above attributes.

In 1961, the writer went into the Marine Corps to fulfill personal desires as well as to serve out his moral obligation to his country. He was fortunate in being stationed at Quantico, Virginia, where three outstanding pole vaulters were in training. It was not long before the writer was out on the track to meet these fine vaulters: Mel Swartz, John Uelses and Dave Tork.

John Uelses was the only one of those three vaulters interested in the fiberglass pole at the time. Uelses had tried to use the fiberglass pole before, but with no success. He had heard about the new techniques and saw the results attained by George Davies in his recent world record vault. His appetite and desires to learn about this new technique was amazing. Uelses had much talent: his speed was equal to a 9.8 second hundred-yard dash man, his strength was enough that he could military press 20 pounds or more over his body weight of 170 pounds, and he was as coordinated as a gymnast.

Uelses asked the writer for specific guidance in using the fiberglass pole because of the many problems he had encountered earlier and because of the writer's years of experience with the pole. After a

winter of hard work in 1962, he felt ready for the indoor season which was rapidly approaching.

It was at the Washington Evening Star Games on January 29, 1962, that Uelses knew his goal was attainable. He vaulted 15'10¼" indoors that night, just a week before his new indoor record of 16' in New York and Massachusetts.[12,13] After Uelses great vault, the tide turned and almost everyone began using fiberglass vaulting poles. It took a 16' vault to open the skeptical eyes of many vaulters and coaches.

Basically, Uelses had been taught the same fundamentals about vaulting with fiberglass that the writer had learned as a vaulter: maximum controllable speed down the runway, proper hand spacing, the hitch-kick in the swing, the rock-back in the swing and the one-two push-off - flyaway completion of the vault. Uelses smashed the 16' barrier because he had learned how to get the maximum effort out of himself and into the pole for returnable energy. It should be noted that Uelses had a handhold of 13'6" the night of February 2, 1962, when he went 16'¼" at Madison Square Garden. That was an effective 12'10" handhold, because the planting box was 8" deep, and gave him a push-off of 4'10". The result was a new indoor record.

In the spring of 1961, another Marine became interested in learning the techniques in fiberglass vaulting and asked for help. This was Dave Tork. Tork was ready to break the 15' level but did not know how to use his fiberglass pole. One Monday afternoon just after the Quantico Relays, Tork and the writer went out to the track and worked with

---

[12] Track and Field News, January, 1962, p. 4.

[13] _____, "On to Seventeen Feet," Time, February, 1962, p. 36.

his problems in vaulting. That day Tork made his first 15' vault. Tork went to the National Amateur Athletic Union meet in New York the next week and made 15' again.[14] From that time on, he was on his way because he now understood the basic techniques of fiberglass vaulting. He was stationed at the Camp Pendleton Marine Base in California where he continued his work with the fiberglass pole.

Uelses set a new outdoor world record on March 31, 1962, at the Santa Barbara Easter Relays in California, going 16'3/4". This made him the first man to attain a record of over 16' outdoors as well as indoors. Dave Tork took second at 15'8¼", the highest height ever made by a non-winning vaulter at that time. Former world record holder, George Davies, was third at a respectable 15'4½".[15]

It was at the Mount San Antonio Relays, Walnut, California, on April 28, 1962, that First Lieutenant Tork of the Camp Pendleton Marines streaked down the runway to set a world's record in the pole vault at 16'2" to become the second vaulter to reach the 16' goal.[16]

The records show that Ron Morris of California, a former University of Southern California vaulter, was the third man to clear the majestic 16' barrier. It was at the National Amateur Athletic Union Championship meet held on June 22-23, 1962, at Walnut, California.[17] Morris made the height on his first attempt to give him the victory.

Morris made some comments about the fiberglass pole:

---

[14]Track and Field News, January, 1962, p. 12.

[15]Ibid., April, 1962, p. 1.

[16]Ibid., May, p. 1.

[17]Ibid., July, p. 6.

> I saw the light. Everybody was going by me... It's a definite aid. I raised my grip up a foot. I got a tremendous thrust at the top... Maybe I could have cleared 16 feet with my old metal pole, but that would have been the absolute limit. With this new gadget I think even 17 feet is possible. After all, I've only been working with it about five weeks.[18]

Morris had been vaulting some fourteen years and was one of the most consistant and outstanding vaulters of all time. He has been a great help to many young vaulters including the writer.

A great crisis arose for the pole vaulters of the United States in 1962 when a young Finnish vaulter, Pentti Nikula, snatched the world's outdoor record.[19] The United States had held the pole vault record for some thirty-five years, in fact, since 1927 when Yale's Sabin Carr succeeded Charles Hoff of Norway by going over 14' in the Inter-Collegiate Amateur Athletic Association of America meet. Pentti cleared the bar at 16'2½" at Kauhava, Finland, on June 22, 1962.[20]

Since his outdoor debut on May 6, 1962, Nikula, vaulting with a Sky Pole, had gone 15'5" in twenty-one of his twenty-four meets. With nine marks at 15'9" or higher, he seemed to be the most prolific vaulter of the fiberglass era.[21]

Don Meyers, a National Collegiate Athletic Association long jump champion in 1961 and pole vault champion in 1962, paid his way to the University of Chicago's Holiday Indoor Meet on December 20, 1962, to attract the eyes of the indoor meet promoters, and attract them he did.

---

[18]Track and Field News, April, 1962, p. 1.

[19]R. V. Ganslen, "Pentti Nikula," Athletic Journal, March, 1963, p. 20.

[20]Track and Field News, July, 1962, p. 18.

[21]Ibid., August, p. 11.

Leaving the other pole vault competition behind at 14', the former University of Colorado star won the event at 14'8", vaulted birdlike over 15'3¼", then scraped and slithered over 16'1¼" for a new indoor record. The crowd held its breath as the crossbar bounced twice on the standards, but it did not fall. The crowd roared. Meyers in the pit threw a handful of sawdust high in the air as he had eclipsed the old mark of 16'3/4" set by John Uelses the previous year. Thus, Meyers became the fourth American vaulter to break the 16' barrier.[22]

Pentti Nikula came back on January 19, 1963, to take the crown with a vault of 16'1-3/4", but only six days later Dave Tork went 16'2¼" in Toronto, Canada, on January 25, 1963. Tork's record lasted about twenty-four hours as Formosa's C. K. Yang, long renowned as a decathlon man but never as a vaulter, raised the record to 16'3¼" at Portland, Oregon.[23,24]

The new 16' group was growing as Maryland's John Belitza joined at Boston on January 26, 1963, to beat Tork and Uelses. Seven men had cleared 16' indoor and outdoor by this date.[25]

Nikula, a man not to be outdone, went 16'8-3/4" in Pajulahti, Finland, on February 2, 1963, to raise his European and the indoor record.

> The fans lifted Valto Olenius, the man behind the Suomi's pole vault boom, and his pupil into the air. The show was not yet over; Nikula needed three tries to master 16 feet 3/4 inches, but quickly made amends by going over 16 feet 8-3/4 inches on

---

[22] Track and Field News, December, 1962, pp. 1,3.

[23] Ibid., January, 1963, p. 4.

[24] _____, "Please Be Good," Time, February, 1963, p. 68.

[25] Track and Field News, January, 1963, pp. 1,3.

his first attempt. He called it a night only after trying 17 feet twice, almost making it on his second try. Nikula used a 16 foot, 160 pound "Sky Pole" and his grip on the record vault was 14 feet 7-$\frac{1}{4}$ inches. He used a run of about 129 feet 7 inches.[26]

Nikula explained his record vault in a later article:

> It was done in an armory on a wooden runway about four feet wide. There were less than 1,000 people there. A blizzard ragged outside. It was near freezing inside.
>
> But that vault convinced me that I can get to 17 feet. Don Bragg, in criticizing the glass pole, says we are acrobats, and not athletes. You can look at me and tell I am no acrobat. I have never been an acrobat. I disagree that the glass pole should be outlawed. Runners are running on better tracks and in better shoes. Nothing is said about golfers using better clubs and balls or tennis players having tighter gut in their racket. The pole vault is the same way... It's progress. The men who reach 16 feet and better still must work as hard and give their very best performance.[27]

Other vaulters joined the 16' club. The first newcomer for 1963 was Rolando Cruz of Villanova who went 16'$\frac{1}{4}$" in Philadelphia on February 2, 1963.[28] Then came the young, promising Brian Sternberg of Washington University. Only nineteen years of age, a sophomore in college, he cleared 16'$\frac{1}{4}$" at the Los Angeles Times Meet on February 10, 1963. Veterans said that he should be the star of the future.[29]

At this point it would be well to note the tone of the spectators, coaches, and athletes. The new Sky Pole came up to lead the world in usage. Comments have been made by such track writers as those in Track and Field News who said:

---

[26]Track and Field News, February, 1963, p. 3.

[27]Ibid., April, p. 18.

[28]Ibid., February, 1963, p. 6.

[29]Ibid., February, 1963, pp. 12,22.

> Fiberglass poles are now so sensational that people outside the sport are taking an interest, which is good for track, but unfortunately, much of what they say is inaccurate. Perhaps the worst delusion is that fiberglass vaulting is not a test of athletic skill. I deplore, as much as anyone, except a few like Don Bragg, the cheapening of old records. I feel there should be two separate events, at least in the records, just as the "butter fly" forced two separate breast stroke events in swimming. But anyone who believes a 16 foot catapulter is not an athlete is ignorant. Catapulting requires speed, strength, agility, and courage. The only previous requisite lacking is experience, and I believe time will remedy that misconception. I believe experience will be even more important with the fiberglass pole. Who knows that vaulters are near the peak? In a few years when 17 feet is common, we'll know better.[30]

Dave Tork said:

> My idea is that it's necessary to get the most out of three things, your speed, your strength, and your pole. I visualize making 17 feet by driving in as hard as possible with all the force I can control. Of course, if the pole bends a little bit wrong, I might fly out of sight and land in the next meet.[31]

Bert Nelson, Track and Field News publisher, said:

> Pole vault heights are now so erratic as to make comment impossible until more is known about fiberglass stress relationship. Reaction to cold already has been demonstrated this year. Wind and slow runways also figure.[32]

Cornelius Warmerdam, the bamboo record holder, is quoted as saying:

> I don't think there is any question that we will see a 17-foot vault this year. The glass pole really launches a man like a projectile. It takes a boy with a lot of courage to stay in there long enough to carry to its peak. As for technique, the biggest difference is that a vaulter now can't keep his hands as close together on the pole as

---

[30]Track and Field News, February, 1963, p. 21.

[31]Ibid., p. 23.

[32]Ibid., March, p. 23.

> we did. I never had my hands spread apart more than two or three inches. On the glass pole, some of the boys have spread them much wider. It has led to a problem of controlling the pole.[33]

Payton Jordon, Stanford's coach, said:

> You can't tell how a glass pole will react. A 150-pound test pole might not bend for a 170 pounder and yet will do so for a lighter man. Our Phil White keeps switching poles. Each time he thinks he has the answer, but later he has to change. This brings up the factor of luck. Luck is an important part of fiberglass vaulting. The temperature and everything has to be just right. The records are set by men who have found just the right pole and learned to work with it.[34]

Brutus Hamilton, retired coach of the University of California at Berkeley, said:

> If these companies were willing to spend the money on research, I'm sure they could develop a four-pound pole which would flip vaulters over 20 feet.[35]

The marks turned again as John Pennel of Northeast Louisiana vaulted 16'3" at the Memphis Relays held at Memphis, Tennessee, on March 23, 1963. He used a pole borrowed from another promising vaulter, Fred Hansen of Rice University in Texas. Pennel liked the pole so well that he traded Rice University another pole for the one he had borrowed.[36]

Pennel was the first college freshman to every make 15', vaulting 15'$\frac{1}{4}$" with an aluminum pole in 1960. He switched to fiberglass in 1961 and made 15'4" in 1962. He continued to have good vaults all year long.

---

[33] Track and Field News, April, 1963, p. 18.

[34] Ibid.

[35] Ibid.

[36] _____, "Borrowed Pole," Time, August, 1963, p. 52.

Hansen and Pratt were the next vaulters to clear 16'.[37]

Again the pole vault became a deciding factor in the decathlon. C. K. Yang vaulted 15'10½" to completely go off the score card in points for that event. Yang accumulated 9,121 points to set a new world record and became the first man to score over 9,000 points. This was done at the Mount San Antonio Relays in Walnut, California, on April 27-28, 1963.[38]

More news hit the papers as Brian Sternberg vaulted 16'5" at the 69th Penn Relays on April 27, 1963.[39] John Pennel came back three days later to erase Sternberg's record by vaulting 16'6-3/4" on April 30, at Monroe, Louisiana.[40]

There were twelve vaulters who hit 16' or better during the month of April. John Rose of Arizona State joined the club on May 17, 1963, in the Los Angeles, California, Coliseum Relays.[41]

Not to be outdone by Pennel, Sternberg vaulted 16'8" at the Compton Invitational meet in Compton, California, on June 7, 1963.[42] The battle for the world crown hit its hottest pace during May, June, and July, and no one was willing to call it quits. The question was who was going to be the first 17-footer?

Everyone had ideas that Brian Sternberg would break the new

---

[37]Track and Field News, April, 1963, p. 1.

[38]Ibid., May, 1963, p. 1,2.

[39]Ibid., p. 7.

[40]Ibid., p. 16,22.

[41]Ibid., p. 23.

[42]Ibid., June, p. 1,10.

barrier of 17'. Like most top vaulters of the fiberglass pole era, Sternberg was as much a gymnast as a trackman. He worked out regularly on a trampoline to improve his balance and body control and was rated one of the ten best trampoline men in the country. On July 5, 1963, he was tuning up for the United States-Russian track meet by performing a complicated trampoline maneuver called a "Fli fis," a double backward somersault with a twist. Something went wrong. He seemed to lose control in midair, fell 14 feet head first and sprawled motionless on the trampoline. Paralyzed from the neck down, he was rushed to a hospital, where doctors found a dislocated cervical vertebra, in layman's language, a broken neck.[43,44]

John Pennel then took rein of the pole vault field. Some of the pressure had been lifted when Sternberg left. In a dual meet against Poland on July 27, 1963, Pennel vaulted 16'8-3/4". Then against Great Britain on August 5, 1963, he soared 16'10¼", falling short of his 17-foot objective.

On August 24, 1963, Pennel made his goal; the 17-foot barrier had been broken. In the Gold Coast Amateur Athletic Union Championships held at Coral Gables, Florida, Pennel vaulted 17'3/4". It marked the sixth time this season that he had raised the outdoor world record mark. His high school teammate Henry Wadsworth, an aluminum pole user, suffering from an injured hip, could only make 15'1", the height where Pennel began jumping. This feat marks another milestone for the

---

[43] _____, "Something Went Wrong," Time, July, 1963, p. 60.

[44] Track and Field News, August, 1963, p. 16.

greatest vaulting era ever seen.[45, 46, 47]

Pennel negotiated 16 feet on thirty-two occasions in twenty-one meets.[48] This was an amazing fact considering that only two years prior to this the first 16-foot vault was made.

What had caused this great rise in height? Several factors were involved. The biggest factor was the pole itself. The early fiber-glass poles produced were not perfect. They were easily broken, as was demonstrated by some of the early models.[49,50,51] With improvement of the pole progress could be seen. Other factors involved were in the vaulters, who were obtaining more knowledge about the event.[52] With fast means of communications, it was not too difficult to obtain the what, when, where, and why. Another factor was in the new rubberized

---

[45] Track and Field News, September, 1963, p. 1.

[46] _____, "A Pole Bends, The Great Pennel Breaks the 17-Foot Barrier," Life, September, 1963, p. 30D, 30E.

[47] Track and Field News, October, 1963, p. 9.

[48] Ibid., November, p. 12.

[49] Ibid., April, 1950, p. 5.

[50] Ibid., February, 1950, p. 3.

[51] Personal correspondence from Bobby Smith, October 19, 1965.

[52] R. V. Ganslen, Mechanics of the Pole Vault, St. Louis, Missouri, 5th Ed., 1963.

runways[53,54] and the new, soft foam rubber pits.[55,56] All these added up to make the vaulters know they could do better because they had better tools to work with and better vaulting conditions.

With the advent of new inventions we shall again see progress, for example, in the new television tape recorder,[57] overhead projectors at track meets,[58] and closed circuit television.

The national high school record was still intact until Marc Savage of Claremont High School in California went 15'¼" in 1963. This broke the old mark of Jim Brewer by ½ inch.[59]

There was not too much advancement in high school vaulters from 1956 to 1963. This was due to a fear of the bend in the fiberglass pole, and to the high school coaches' lack of knowledge about how to control this bend, along with some of the other vaulting problems involved with the fiberglass pole. This has now been partially remedied as much literature is now on the market.

In 1964, pole vaulters were again hard at work. John Uelses, now

---

[53]B. Bowerman, "Oregons Hard Surfaces," Track and Field Clinic Notes, 1959, p. 79.

[54]D. Rankin and K. Doherty, "All Weather Surface for Field Events," Scholastic Coach, January, 1959, p. 12.

[55]Jim Crakes, "Foam Rubber Pits," Athletic Journal, January, 1961, p. 4.

[56]T. A. Smith, "Portable Jumping Pits," Athletic Journal, January, 1961, p. 4.

[57]_____, "Coaching with a T.V. Tape Recorder," Scholastic Coach, January, 1964, p. 56.

[58]J. W. Kautz, "Overhead Projector at Track Meets," Athletic Journal, January, 1964, p. 23.

[59]Track and Field News, January, 1964, p. 46.

at La Salle College, and Sam Kirk, of Redlands University, were leading the 1964 indoor season with each at 16'3". Fred Hansen, a fast newcomer, was reported doing 16'4" in an exhibition.[60] It looked like another good year for vaulters.

The high school area became alive when Paul Wilson of Warren High School in Downey, California, at the age of sixteen vaulted 15'7½". He was only a junior in high school and would be back for that 16-foot before completing high school.[61] Wilson did come back on May 28, 1964, at the Southern California Section semifinals held in Comptom, California, to be the first high school student to vault over 16 feet. He vaulted his age and bettered his own mark of 15'7½".[62]

Adding another vaulter to the 17-foot club was no surprise except for the question as to who it would be. On June 5, 1964, Fred Hansen, a graduate student at Rice University, scaled 17'1" in the Texas Federation Meet. Eight days later in San Diego, he proved it was no fluke by vaulting 17'2".

Hansen was quick to praise the fiberglass pole:

> It's progress. It doesn't throw you over the bar like a lot of people think. Vaulting is much more technical now. It will get better too. The latest reports from Texas hinted he had gone 17'6" in practice the week prior to his 17'1" vault.[63]

True to predictions, Hansen vaulted 17'4" on July 26, 1964, in the United States-Russian Dual. Hansen made the 1964 Olympics in Tokyo

---

[60] Track and Field News, May, 1964, p. 11.

[61] Ibid., p. 17.

[62] Ibid., June, 1964, p. 18.

[63] Ibid., p. 14.

and won at 16'8-3/4". The story of this successful vault was exciting and a true victory for the United States.[64]

Some doubts arose as to whether or not these vaults would be accepted as world records. There were two reasons for this: first, the International Amateur Athletic Federation had not ratified the use of all-weather surfaces,[65] and secondly, there was a question of the fiberglass pole being legal. The International Amateur Athletic Federation was, however, forced into an early meeting at Tokyo to decide these and other questions. According to Track and Field News:

> The International Amateur Athletic Federation technical committee removed all objections or reservations as to world records made on all-weather surfaces...This unfroze Bob Hayes' 9.1 at St. Louis and the records of Fred Hansen and John Pennel, which were formally approved by the International Amateur Athletic Federation Council and Congress.
>
> The technical committee discussed the varying elasticity of poles and the desirability or otherwise of attempting to lay down specifications and it was decided the U.S.A. and Germany should conduct some research. This means the use of fiberglass poles will continue unrestricted.[66]

Sighs of relief were probably uttered throughout the pole vaulting world when the fiberglass pole was ratified. The year 1964 produced thirty vaulters who had made 16 feet or better.[67] Out of this thirty, almost every one used a fiberglass vaulting pole. It was of interest to see what type poles the vaulters used and the heights they attained, these findings are shown in Table 1.

An unusual precedent was started in 1965 when the young high

---

[64]Track and Field News, October-November, p. 20.

[65]Ibid., p. 42.

[66]Ibid., December, p. 10.

[67]Ibid., January, 1965, p. 24.

TABLE I

16-FOOT VAULTERS OF 1964, TYPE POLE USED AND HEIGHTS OBTAINED

Name	Country	Sky Pole	Other	Unknown	Best Height
Ankio, Risto	Finland	X			16'0"
Bliznyetsov, Gennadiy	Russia	X			16'3"
Brown, Mike	U.S.A.			X	16'0"
Chase, Jeff	U.S.A.	X			16'1-1/2"
Cramer, John	U.S.A.	X			16'0"
Cruz, Rolando	Puerto Rico	X			16'3-1/2"
Hansen, Fred	U.S.A.	X			17'4"
Hein, Mel	U.S.A.	X			16'5"
Kirk, Sam	U.S.A.	X			16'3"
Lehnertz, Klaus	Germany	X			16'5"
Lesek, Roman	Yugos.	X			16'1-1/4"
Manning, Floyd	U.S.A.	X			16'4-1/2"
Meyers, Don	U.S.A.	X			16'9"
Morris, Ron	U.S.A.	X			16'4-1/2"
Neutzling, Bob	U.S.A.			X	16'1/4"
Nikula, Pentti	Finland	X			16'1-3/4"
Nordwig, Wolfgang	Germany	X			16'5-1/4"
Pemelton, Billy	U.S.A.	X			16'2"
Pennel, John	U.S.A.	X			16'8-1/2"
Pratt, Gerald	U.S.A.	X			16'4-1/2"
Preussger, Manfred	Germany	X			16'5-3/4"
Reinhardt, Wolfgang	Germany	X			16'9-1/4"
Rose, John	U.S.A.	X			16'0"
Sokolowski, Wlodzmierz	Poland			X	16'5-3/4"
Tomasek, Rudolf	Czech.	X			16'5"
Tork, Dave	U.S.A.	X			16'8"
Uelses, John	U.S.A.	X			16'3"
White, Phil	U.S.A.	X			16'1-1/2"
Wilson, Paul	U.S.A.	X			16'0"
Yang, C. K.	Taiwan	X			16'1"

schooler Paul Wilson led the nation in the indoor pole vault. On February 18, he vaulted 16'3/4" in the Los Angeles Times Meet in a special high school division.[68]

Wilson was not through as he proved on March 21, 1965. He soared 16'6-3/4" at the Southern Counties Track Meet in Westminister, California. His teammate, Bob Steinhoff was fast catching up.[69]

Steinhoff became the second prepster to clear 16 feet with a 16'1" effort in the 27th annual Santa Barbara Relays on March 27, 1965. Not only the second highest high school vaulter ever, he also became the second best vaulter in the nation that year, trailing teammate Paul Wilson in both cases.[70]

The question of who was to break the world record again was puzzling. Fred Hansen retired after winning the Olympics. John Pennel won the National Amateur Athletic Union Meet with another 17 foot vault, making him the most logical contender.[71] However, with so many others mastering 16-feet or better, a single choice would have been difficult. It was almost certain that the 18-foot barrier would be broken before long.

Figure 1 shows the percentage of vaulters using fiberglass poles in the N.C.A.A. and N.A.A.U. Championships in 1957 and the increased use from 1960 through 1964. The greatest advancement in the utilization of fiberglass poles took place between 1961 and 1962. The writer

---

[68] Track and Field News, February, 1965, p. 10.

[69] _____, "Heights School," Newsweek, May, 1965, p. 98.

[70] Track and Field News, April, 1965, p. 3.

[71] Ibid., July, pp. 17-18.

believes the reason for this great increase in use of fiberglass poles had a correlation with the world record vaults of Oklahoma State University's pole vaulter, George Davies, who vaulted 15'10" in 1961 and, then, U.S. Marine Corps vaulter, John Uelses, who vaulted 16' in 1962. Both of these vaulters used fiberglass poles.

Figures 2 and 3 show the heights attained in the N.C.A.A. and N.A.A.U. Championships with the use of the fiberglass pole as compared to other poles.

What has the pole vault done for track and field and what does it hold for the future? The landing pits, planting boxes and standards have already changed. The runways have played their part. Anyone attending track meets today would notice the difference in the landing areas. For vaulters long ago it was just solid tera ferma, then sand, then wooden shavings. Now they use big foam rubber-fiber protected landing pads or air mattresses. This foam rubber and air mattress type landing area has been a help in reducing injury. Many vaulters would turn ankles, or even break bones in the sand and wood shaving landing areas. The fiberglass vaulter of today lands on his back, not his feet. Imagine what would happen if a vaulter tried to land on his back in the sand or wood shavings.

The planting boxes are curved outboard and some even set out at wider angles on the sides and rear of the box. This simple innovation has greatly reduced damage to the poles.

The vaulting standards are used to hold the crossbar in position. Normally they have been vertical posts with pins to hold the crossbar. Today's vaulting standards are looking like upside down "L"s. For example, the crossbar is placed between points A and B, as shown in

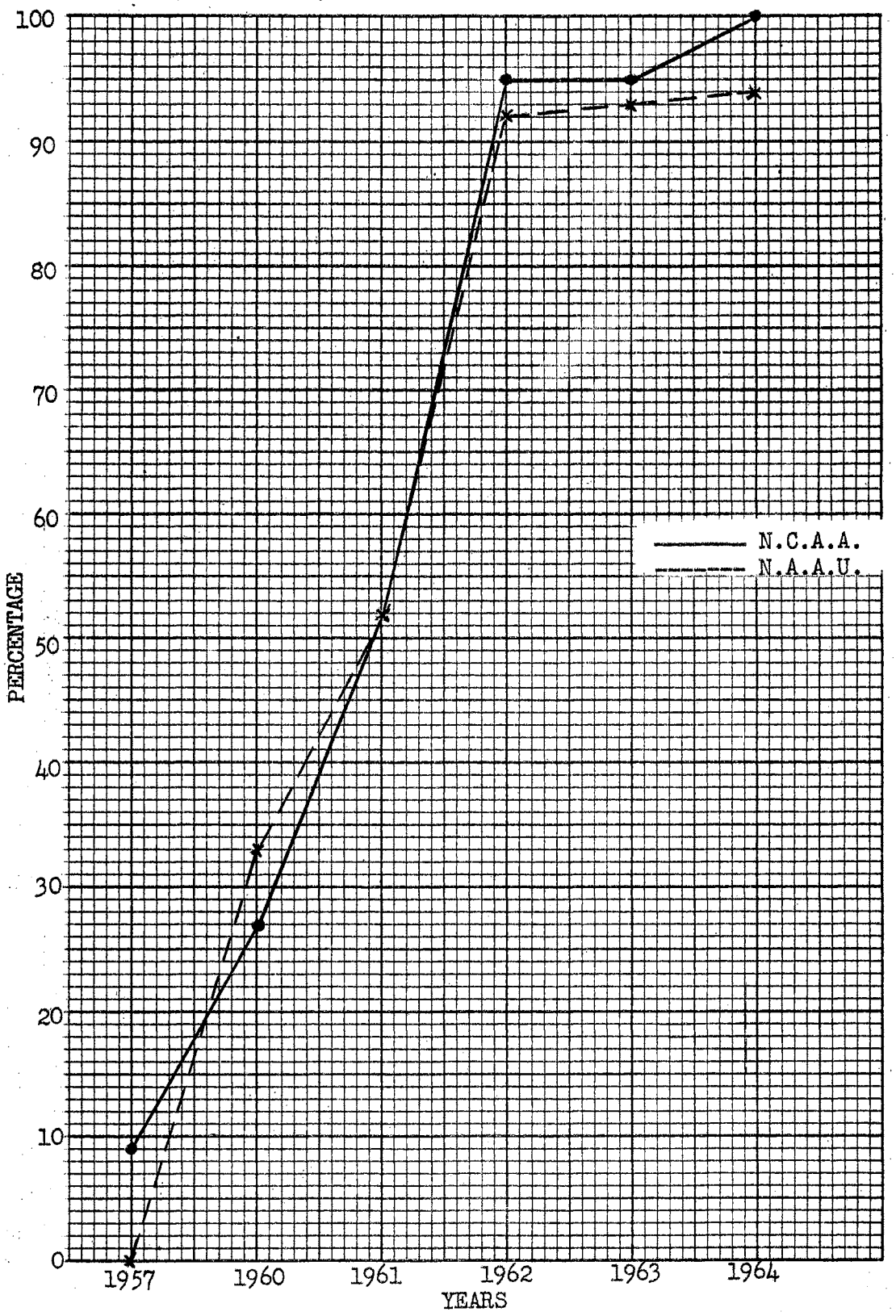

Fig. 1. Percentage of Vaulters Using Fiberglass Poles in the N.C.A.A. and N.A.A.U. Championships, 1957-1964.

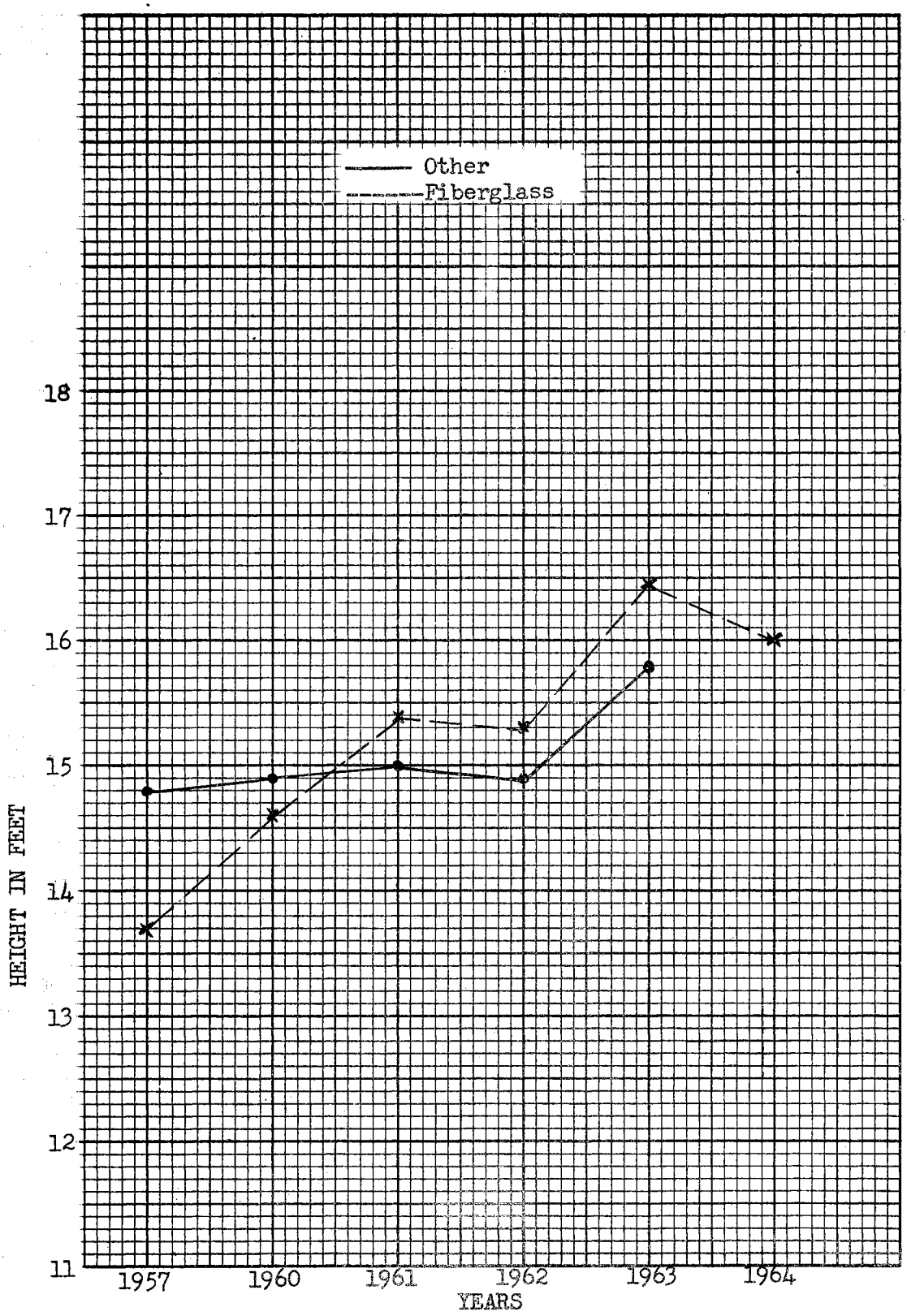

Fig. 2. Height, Attained in the N.C.A.A. Championship Meets with the Use of the Fiberglass Pole as Compared to Others.

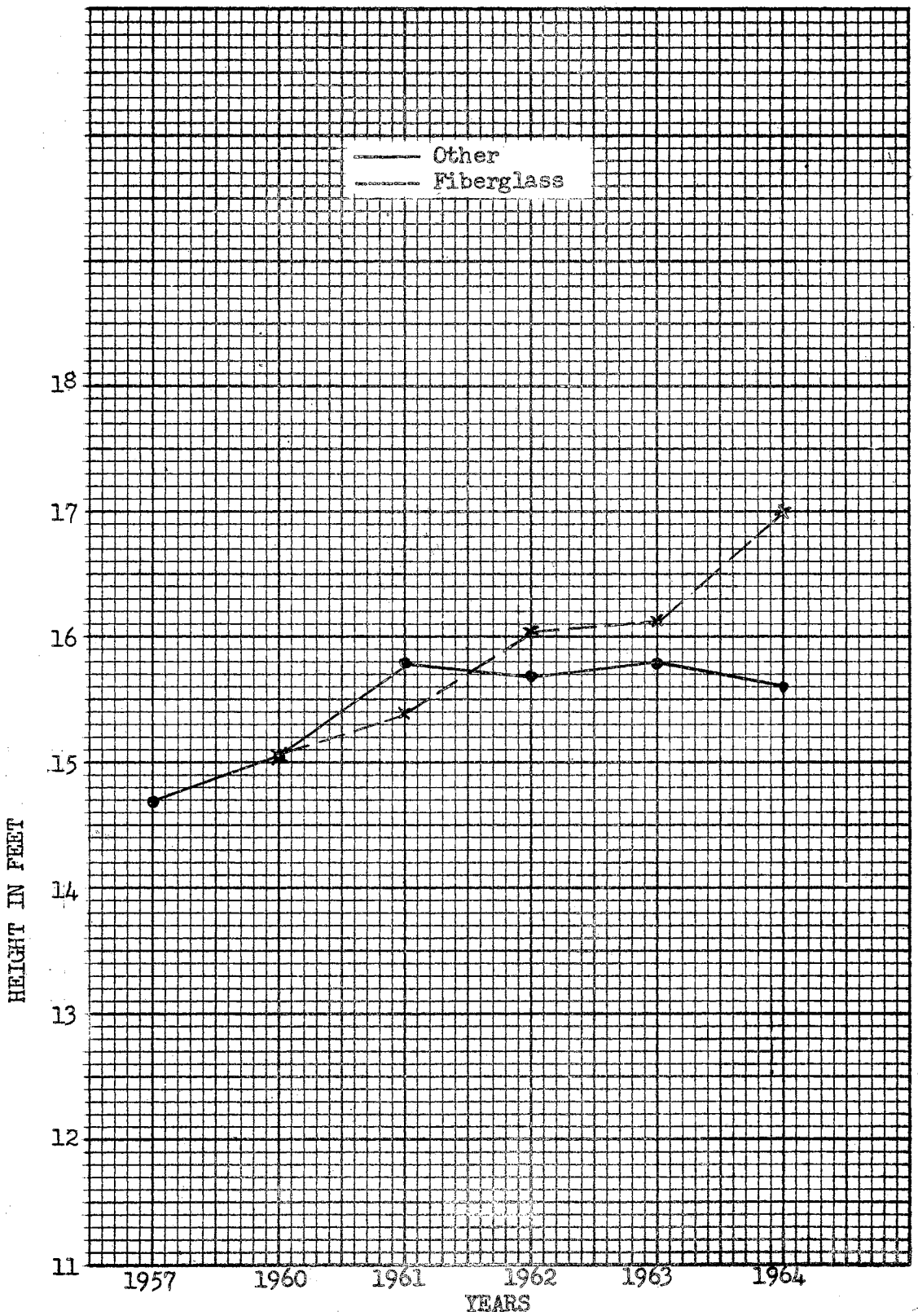

Fig. 3. Height, Attained in the N.A.A.U. Championship Meets with the Use of the Fiberglass Pole as Compared to Others.

Figure 4. This innovation has been a great asset psychologically and as a safety factor. A vaulter before this new type of standard, had a good chance of hitting the up-rights, C and D. The A.A.U. Official Track and Field Handbook states in rule XLII that "The up-rights or posts shall be placed not less than 12 feet (3.66 meters) nor more than 13'2¼" (4.02 meters) apart."[72] It can be seen that 13'2½" would not be a safe width for vaulters. This rule may be changed in the near future.

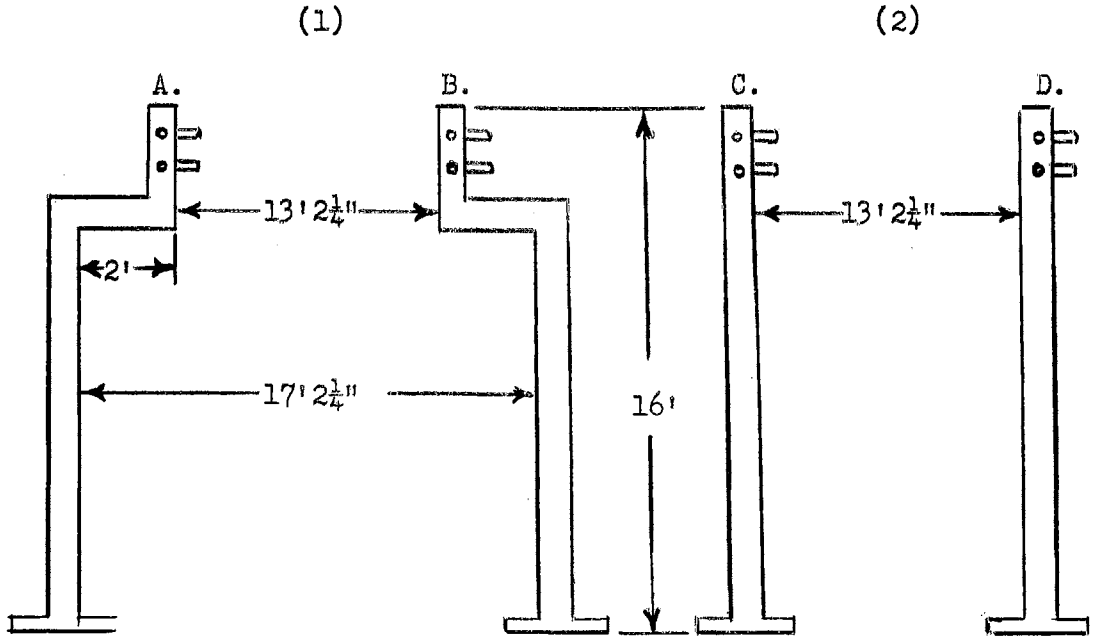

Figure 4. Diagram of the pole vault up-rights, (1) the newer type and (2) the standard type

The last item of change that will be discussed in this report concerns the runways. The first runways were of ordinary dirt or grass. Today's runways are rubberized with a basic composition of asphalt and various amounts of rubber. Other types of runways, such as Grasstex

---

[72]The A.A.U. Official Track and Field Handbook, Amateur Athletic Union of the U.S., 1964, p. 146.

and Tartan, have still another type of composition of which the author was not familiar.

The biggest factor of all has been the fiberglass pole. Other fiberglass poles are being made, such as the Thermo-flex pole produced by Thermo-Flex, Inc. and the Meteor pole produced by Sports Beconta, Inc. These poles, plus more that will be devised in the future, hold for the athlete, coach, spectator new world records.

CHAPTER V

SUMMARY

This study was undertaken to condense and review the progress of fiberglass pole vaulting over the past fifteen years. A subproblem was to review a few of the vaulting techniques and other innovations which have been instrumental in the progress of the pole vault event.

Data was obtained and gleaned of pertinent material about the fiberglass pole from many sources. Questionnaires and personal letters were used to establish unpublished facts and to confirm others. Library research was conducted to fill in and supplement the facts on hand. The materials were then organized into chronological order.

The first significant problem was determining the origin of the fiberglass pole. Herbert Jenks, of the Browning Arms Company of Costa Mesa, California, developed the idea from tuna-jack fishing poles. He thought the idea good enough that he confronted Virgil Jackson, the former coach of Bob Mathias to get his thoughts and ideas. From Jenks and Jackson emerged the production of the first real fiberglass poles. Virgil Jackson decided upon a name for the pole, calling it the "Sky Pole". It has been used ever since as the trade mark of this particular company.

Good college vaulters were unwilling to take a chance on their present vaulting positions by using this new pole, so Jenks decided to try the high school vaulters. Jim Brewer was one of these test pilots,

and he did quite well in setting a new high school national record at 15'¼".

The next great impetus in the use of the pole was when the writer began experimenting with it while attending Oklahoma State University in 1958. It was at Oklahoma State University that the fundamental techniques of fiberglass vaulting were developed. These techniques were later used at Quantico, Virginia, where the writer was serving in the United States Marine Corps. In the meantime, George Davies, coached by Ralph Higgins, produced the first world record using fiberglass.

At Quantico there were fine vaulters, such as Mel Swartz, Dave Tork, and John Uelses. The big breakthrough for fiberglass vaulting came when Uelses broke the 16-foot barrier. Others began to see that the fiberglass pole actually did have potential. One of the reasons they had not realized this before was due to the lack of speed by previous vaulters and to their lack of knowledge of how to use the fiberglass pole.

It was in 1962 that the other types of poles began to fade out of use. The fiberglass pole was in almost 100 percent use in 1964 as can be seen in Figure 1.

The pole vault marks of today show the progress of the event as shown in Figures 2 and 3. However, the marks have not gone up just because of the pole. The new rubberized runways, foam rubber landing pits, new planting boxes, and reading material on the event have been great contributing factors.

Recommendations

1. Future studies should be made with the purpose of being specific in analyzing the technique of vaulting with fiberglass poles.

2. It is recommended that more research be given to foreign countries and their development in vaulting with fiberglass poles.

3. It is suggested that the investigation ordered by the International Amateur Athletic Federation be included in a future study.

BIBLIOGRAPHY

Books

Breshahan, G. T., Tuttle, W. W. and Cretzmeyer, F. Track and Field Athletics. St. Louis: The C. V. Mosly Company, 1964.

Doherty, J. K. Modern Track and Field. Englewood Cliffs, New Jersey: Prentice-Hall Publishing Company, 1963.

Ecker, Tom. Championship Track and Field. Englewood Cliffs, New Jersey: Prentice-Hall Publishing Company, 1961.

Ganslen, R. V. Mechanics of the Pole Vault. St. Louis, Missouri: John Swift and Company, 1963.

Pearson, G. F. D. Athletics. Edinburgh, England: Thomas Nelson and Sons, Ltd., 1963.

Olympic Games Yearbook. 1956.

The A. A. U. Official Track and Field Handbook. The Amateur Athletic Union of the United States. New York, New York: 1964.

Track and Field Rules. National Federation of State High School Athletic Association. Chicago, Illinois: 1958.

Track and Field Guide. National Collegiate Athletic Association. National Collegiate Athletic Bureau, New York: 1960.

_____. Salak's Sports Directory. Brooklyn, New York: Theo Gau's Sons, Inc., 1963.

Periodical Literature

Anderson, D. "Pneumatic Pit for Indoor Vaulting." Athletic Journal, XLIII (March, 1963), p. 1.

Arensen, Arne U. "Analyzing the Pole Vault." Athletic Journal, XXXIX (September, 1959), pp. 28-31.

Bowerman, W. J. "More Safety for Vaulters." Athletic Journal, XLIV (May, 1964), p. 72.

Bowerman, W. J. "Oregon's Hard Surfaces." Track and Field Clinic Notes, XXIX (1950), p. 79.

Bragg, Don. "The 16 Foot Pole Vault is a Fraud." All Sports Magazine, (December, 1962), p. 34.

Brown, G. B. "Jump Up, Twist Around, Set Another Record." Sports Illustrated, IVIII (February, 1963), p. 9.

Canham, Don. "Pole Vaulting Simplified." Athletic Journal, XXXVII (October, 1957), pp. 6-8.

Carroll, Bill. "Oklahoma Pole Vaulting." Track and Field Clinic Notes. (May, 1961), pp. 89-96.

Coniam, Jack. "Three Critical Steps in the Pole Vault." Scholastic Coach, XXXIII (November, 1963), p. 70.

Crakes, Jim. "Foam Rubber Pits." Track and Field Clinic Notes, (November, 1963), p. 11.

Crowell, C. R. "I.C.A.A.A.A. Results of Pole Vault Questionnaire." Track and Field Quarterly Review, (February, 1965), pp. 38-44.

Davies, George. "Worlds Highest Vaulter." Athletic Journal, XLII (June, 1961), p. 47.

Dooley, A. C. "How He Trains." The Journal of Technical Track and Field Athletics, IX (September, 1962), pp. 265-267.

Ecker, Tom. "No More Guessing in Fiber Glass Vaulting." Athletic Journal, XLV (March, 1965), p. 36.

Ecker, Tom. "Fiberglass Vault." Athletic Journal, XLV (April, 1965), pp. 30-33.

Embretsen, George. "Pole Vaulters in Northern Schools." Athletic Journal, XXXVII (July, 1957), p. 20.

Ganslen, R. V. "Pole Vault Techniques." Scholastic Coach, XXVII (February, 1958), p. 8.

Ganslen, R. V. "Pole Vault Techniques, Part II." Scholastic Coach, XXVII (March, 1958) p. 25.

Ganslen, R. V. "Pole Vaulting, A-Z." Track and Field Clinic Notes, XXII (June, 1951), p. 25.

Ganslen, R. V. "Pentti Nikula." Athletic Journal, XLIII (March, 1963), pp. 20-21.

Ganslen, R. V. "Answers to Pole Vault Questions." The Journal of Technical Track and Field Athletics, XII (June, 1963), p. 376.

Ganslen, R. V. and Higgins, R. "The Cowboy Vaulting Twins." Athletic Journal, XL (March, 1960), pp. 12-14.

Gillett, O. B. "Anyone Can Pole Vault." Athletic Journal, XLIV (January, 1963), p. 43.

Greer, H. "Build your own Indoor Vaulting Box." Scholastic Coach, XXXIV (January, 1965), p. 44.

Grossart, R. R. "Weight Training for Field Events." Track and Field Clinic Notes, (1961), pp. 36-40.

Housden, Fred. "Pole Vault Questions and Answers." The Journal of Technical Track and Field Athletics, V (September, 1961), pp. 148-150.

Higgins, R. "The Pole Vault - High School to College." Track and Field Clinic Notes, (1960), pp. 140-148.

Jarver, Jess. "Considerations in the use of Fiberglass Poles." The Journal of Technical Track and Field Athletics, X (December, 1962), pp. 312-314.

Jarver, Jess. "Pole Vault Problems Created by using Fiberglass Poles." The Journal of Technical Track and Field Athletics, V (September, 1961), pp. 152-155.

Jarver, Jess. "Vaulting with Fiberglass Poles." The Journal of Technical Track and Field Athletics, VII (March, 1962), pp. 195-196.

Jeitner, Gerhard. "Fiberglass Vaulting Technique." The Journal of Technical Track and Field Athletics, XIX (March, 1965), pp. 598-599.

Jones, T. E. "Progress in the Development of the Pole Vault." Athletic Journal, XXVI (March, 1946), pp. 23-30.

Jordon, Payton. "Proper Training for Pole Vaulters." Coach and Athlete, XXI (April, 1959), pp. 16-17.

Jores, J. "Bunch of the Boys were whooping it up." Sports Illustrated, XXII (June, 1965), p. 56.

Kautz, J. W. "Overhead Projector at a Track Meet." Athletic Journal, XLIV (January, 1964), p. 23.

Kiess, A. "Low Cost Foam Rubber Pit." Scholastic Coach, XXXIV (January, 1965), p. 18.

Kring, R. F. "Vaulting for Height Every Day." Scholastic Coach, XXXI (April, 1962), p. 28.

Kring, R. F. "Mass Production Pole Vaulting Teaching." Scholastic Coach, XXXIII (February, 1964), pp. 26-28.

Kring, R. F. "Questions on the Pole Vault." International Track and Field Digest, (June, 1956), pp. 152-154.

Luke, Bro. B. G. "The First Lesson in Pole Vaulting." Scholastic Coach, XXVII (December, 1957), p. 7.

Masin, Herman. "The Clash Over Glass." Scholastic Coach, XXXI (April, 1962), p. 5.

Maule, Tex. "He Could Do It on Bamboo." Sports Illustrated, XVI (February, 1962), pp. 10-12.

Miller, R. I. "Pole Vaulting Perfection." Scholastic Coach, XXII (February, 1953), pp. 24-28.

Mitchell, J. T. "Worlds First 16' High School Vaulter." Scholastic Coach, XXXIV (February, 1965), pp. 8-9.

Morcum, R. "Pole Vaulting," Track and Field Clinic Notes, (1962), pp. 85-96.

Morris, Ron. "The Pole Vault." Track and Field Quarterly Review, (February, 1964), pp. 37-45.

Mulrooney, John C. "Teaching Youngsters to Pole Vault." Track and Field Clinic Notes, (1963), p. 56.

Olson, Tom. "Demonstration of Fiber Glass Poles." Track and Field Quarterly Review, (June, 1956), pp. 53-59.

O'Connor, H. W. "Helpful Tips for Beginning Vaulters." Scholastic Coach, XXX (March, 1961), p. 32.

O'Connor, H. W. "Track Tips by the Dozen." Scholastic Coach, XXX (April, 1961), pp. 38-39.

Pennel, John. "How He Trains." The Journal of Technical Track and Field Athletics, XII (June, 1963), pp. 372-373.

Perrin, Bill. "Developing Pole Vaulters." Athletic Journal, XLI (June, 1960), p. 9.

Perrin, Bill. "Work Your Vaulters in the Gym." Athletic Journal, XLI (December, 1960), p. 36.

Perrin, William. "Technique of Six Champion Vaulters." Athletic Journal, XL (April, 1960), pp. 34-36.

Perrin, William. "Coaching the High School Vaulter." Scholastic Coach, XXX (February, 1961), pp. 14-15.

Perrin, Bill. "Survey of 15 Footers." Athletic Journal, XLIII (March, 1963), pp. 20-21.

Perrin, W. E. "A Trainer for Fiberglass Pole Vaulting." Athletic Journal, XLIV (January, 1964), pp. 76-78.

Pikulsky, T. T. "Fiberglass Pole Vaulting." Athletic Journal, XLIV (March, 1964), pp. 16-18.

Pikulsky, T. T. "Fiberglass Vaulting." Track and Field Quarterly Review, (February, 1965), pp. 58-61.

Potts, Frank. "Fiberglass Pole and Vaulting." Track and Field Quarterly Review, (October, 1964), pp. 56-60.

Rankin, Dave. "Macadam Surfaces." Track and Field Clinic Notes, (June, 1954), pp. 9-12.

Rankin, Dave and Doherty, K. "All Weather Surface for Field Events." Scholastic Coach, XXVIII (January, 1959), pp. 12-13.

Richards, Robert. "Fiberglass Poles are Killing Pole Vaulting." Complete Sports, (January, 1963), p. 20.

Ryan, Frank. "Teaching the Pole Vault." Scholastic Coach, XXXI (March, 1962), p. 8.

Ryan, F. "Fiberglass Pole Vaulting." Scholastic Coach, XXXIII (March, 1964), pp. 8-9.

Sharpley, Frank. "Teaching Beginners to Pole Vault." The Journal of Technical Track and Field Athletics, III (March, 1961), pp. 75-79.

Sheehan, Joseph M. "More to Pole Vaulting than the Jump." Amateur Athlete, XXVI (March, 1955), pp. 6-7.

Stein, J. U. "Train Your Vaulters on the Ropes." Scholastic Coach, XXXIII (January, 1964), pp. 46-50.

Smith, T. A. "Portable Jumping Pits." Athletic Journal, XX (January, 1961), p. 4.

Timmons, B. "Championship Track and Field Coaching Methods." Scholastic Coach, XXIX (March, 1960), p. 32.

Tuppeny, Jim. "Glass Pole Vaulting." Track and Field Quarterly Review, (February, 1965), pp. 45-57.

Warmerdam, Cornelius. "Pole is a Pole is a ..." Newsweek, LIX (February, 1962), p. 89.

Warmerdam, C. "The Pole Vault." International Track and Field Digest, (June, 1956), pp. 148-151.

Warmerdam, C. "The Fifteen Foot Vault." Track and Field Clinic Notes, (January, 1960), pp. 149-155.

Warmerdam, C. and Morcom, R. "Pole Vaulting." Track and Field Clinic Notes, (June, 1954), pp. 43-48.

Welch, Walter. "A Seventeen Foot Vault." Athletic Journal, XXXV (May, 1965), pp. 18-20.

Werner, C. D. "How to Build and Maintain a Track." Track and Field Clinic Notes, (1963), pp. 84-86.

Wilt, Fred. "An Introduction to Mechanics and Its Application to Track and Field Events." Track and Field Quarterly Review, (February, 1964), pp. 50-55.

Yelverton, W. "Upper Glass Pole Vaulting." Scholastic Coach, XXXIV (April, 1965), pp. 14-15.

_____. "A Cost-Free All Weather Track." The Journal of Track and Field Athletics, V (September, 1961), p. 150.

_____. "Worlds Highest Pole Vaulter, Brian Sternberg." Life, (July, 1963), p. 32A.

_____. "A Pole Bends, the Great Pennel Breaks 17' Barrier." Life, (September, 1963), p. 30D.

_____. "How Fair is a Flip with the Flexible Pole?" Life, LIV (February, 1963), p. 36.

_____. "Fiberglass Airlift." Look, XXVII (May, 1963), pp. 74-77.

_____. "Higher and Higher." Newsweek, LIX (February, 1962), p. 57.

_____. "Sky's the Limit." Newsweek, LXI (May, 1963), p. 64.

_____. "The Flying Finn." Newsweek, LXI (February, 1963), p. 85.

_____. "Heights School." Newsweek, LXV (May, 1965), p. 98.

_____. "Coaching with a Television Tape Recorder." Scholastic Coach, XXXIII (January, 1964), p. 8.

_____. "Alone at the Top of the Mark." Sports Illustrated, XIX (September, 1963), pp. 16-17.

_____. "On to Seventeen Feet." Time, LXXIX (February, 1962), pp. 36-38.

_____. "Please Be Good." Time, LXI (February, 1963), p. 68.

_____. "Something Went Wrong." Time, LXXXII (July, 1963), p. 60.

_____. "Borrowed Pole." Time, LXXXII (August, 1963), p. 52.

Encyclopedia

Menke, F. G. Encyclopedia of Sports. New York: A. S. Barnes and Company, 1963.

Unpublished Materials

Personal correspondence, Browning Arms Company, December 13, 1965.

Personal correspondence, Drake, E. R., November 15, 1965.

Personal correspondence, Jackson, V. M., December 10, 1965.

Personal correspondence, Jenks, H., October 8, 1965.

Personal correspondence, Mathias, R. B., November 1, 1965.

Personal correspondence, Nelson, B., October 16, 1965.

Personal correspondence, Smith, B., October 19, 1965.

Personal correspondence, Sports Beconta, Inc., November 20, 1965.

Personal correspondence, Thermo-Flex, Inc., November 20, 1956.

Personal correspondence, Williams, H. G., December 31, 1965.

Personal correspondence, Wilt, F., November 24, 1965.

Personal correspondence, Wolfe, V., January 16, 1966.

Newspapers and Newsletters

Daily Oklahoman, May 20, 1959.

Newport-Balboa Press, July 13, 1950, p. 4.

Santa Ana Register, February 17, 1952, p. D2.

San Francisco Chronicle, December 10, 1949.

San Francisco News, March 29, 1950.

St. Louis Globe Democrat, June 16, 1963.

Track and Field News, February, 1950, p. 3.

Track and Field News, April, 1950, p. 5.

Track and Field News, July, 1950, p. 1,5.

Track and Field News, June, 1961, p. 1,4.

Track and Field News, January, 1962, p. 4, 12.

Track and Field News, April, 1962, p. 1.

Track and Field News, May, 1962, p. 1.

Track and Field News, July, 1962, p. 6,18.

Track and Field News, August, 1962, p. 11.

Track and Field News, December, 1962, p. 1,3.

Track and Field News, January, 1963, p. 1,3-4.

Track and Field News, February, 1963, p. 3,6,12,21-23.

Track and Field News, March, 1963, p. 23.

Track and Field News, April, 1963, p. 1,18.

Track and Field News, May, 1963, p. 1,2,7,16,22-23.

Track and Field News, June, 1963, p. 1,10.

Track and Field News, August, 1963, p. 16.

Track and Field News, September, 1963, p. 1.

Track and Field News, October, 1963, p. 9.

Track and Field News, November, 1963, p. 12.

Track and Field News, January, 1964, p. 46.

Track and Field News, May, 1964, p . 11,17.

Track and Field News, June, 1964, p. 14,18.

Track and Field News, August, 1964, p. 1.

Track and Field News, October-November, 1964, p. 20,24.

Track and Field News, December, 1964, p. 10.

Track and Field News, January, 1965, p. 24.

Track and Field News, February, 1965, p. 10.

Track and Field News, April, 1965, p. 3.

Track and Field News, July, 1965, p. 17-18.

Tribune-Sun, San Diego, December 6, 1949, p. B3.

Tribune-Sun, San Diego, December 22, 1949.

Tribune-Sun, San Diego, January 21, 1950.

VITA

AUBREY CHARLES DOOLEY

Candidate for the Degree of

Master of Science

Thesis: A HISTORY OF FIBERGLASS POLE VAULTING

Major Field: Health, Physical Education and Recreation

Biographical:

Personal Data: Born in Enid, Oklahoma, December 19, 1937, the son of Harrison and Opal Irene Dooley.

Education: Attended elementary school at Burlington Elementary School in Burlington, Oklahoma; attended and graduated from Braman High School, Braman, Oklahoma; received the Bachelor of Science degree from Oklahoma State University, with a major in Health, Physical Education and Recreation, in February, 1961.

Professional Experience: Communication Officer in the United States Marine Corps from March, 1961 to March, 1965. Graduate Assistant. Department of Athletics, Oklahoma State University from September, 1965 to May, 1966. Member of the American Association for Health, Physical Education and Recreation; member of National Track Coaches Association; All American in Track and Field, 1960; National Amateur Athletic Union Champion in the pole vault in 1960; President of the Oklahoma State University Physical Education Major and Minor Club; Member and Councellor in the Oklahoma State University Fellowship of Christian Athletes.