

WEIGHT GAIN COMPARISONS BETWEEN  
WEIGHT-MAKING AND NON-WEIGHT-MAKING  
HIGH SCHOOL WRESTLERS

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**WEIGHT GAIN COMPARISONS BETWEEN WEIGHT-MAKING  
AND NON-WEIGHT-MAKING HIGH SCHOOL WRESTLERS.**

by

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## INTRODUCTION

The problem of weight gain comparisons between weight-making and non-weight-making high school wrestlers does not readily lend itself to statistical procedures. However, the ordinary comparisons which are included are believed to be of more value in this case because they can be more easily interpreted by the average parent for whose benefit this problem was attacked.

The term weight-making as used in this study, simply means that a boy has reduced his weight a few pounds in order to "weigh-in" at the limit for his weight class as specified by the rules which govern the sport of wrestling.

In high school wrestling the weight class limits are:<sup>1</sup>

	95 pounds and under		
105	"	"	"
115	"	"	"
125	"	"	"
135	"	"	"
145	"	"	"
155	"	"	"
165	"	"	"
Heavy weight. <sup>2</sup>			

If a boy, who normally weighs one hundred and twenty-nine pounds, wishes to wrestle in the one hundred and twenty five pound class and reduces his weight to one hundred and twenty five pounds, he will be referred to as a weight-maker.

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<sup>1</sup>Spaulding's National Intercollegiate and Interscholastic Rule Guide. American Sports Publishing Co. New York. 1934.

<sup>2</sup>The heavy weight has been changed to 165 pounds.

If a one hundred and twenty nine pound boy does not reduce his weight but competes in the next above weight class or, the one hundred and thirty five pound class, he will be referred to as a non-weight-maker.

In selecting the weight-makers and non-weight-makers for the comparison in this study, the three top ranking and the three bottom ranking boys in each weight class were used.

For example let us take the one hundred and twenty five pound class.

#### THE 125 POUND CLASS

Rank Number.	Boy's Name.	
1 - - - -	Henson	
2 - - - -	Benson	_____ Weight-makers
3 - - - -	Combs	
<hr/>		
4 - - - -	Stone	
5 - - - -	Byrd	
6 - - - -	Johnson	
7 - - - -	Jones	
8 - - - -	Williams	
<hr/>		
9 - - - -	Miller	
10 - - - -	Holland	_____ Non-weight-
11 - - - -	Campbell	makers.

The boy who can defeat all other boys who weigh one hundred and twenty five pounds is ranked number one. The next best boy is ranked number two, and so on down the list.

The three top ranking boys, number one, number two, and number three, are required to hold their weights down near the one hundred twenty five pound mark which is the weight limit for that weight class according to the rule book.<sup>3</sup>

The other boys, numbers four to eleven inclusive, do the same amount of work but pay no attention to weight re-

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<sup>3</sup> Op. cit.

duction. However, if any boy in this group gains weight to the point where it would be unfair for him to wrestle in the one hundred twenty-five pound class, he is moved up to the one hundred and thirty-five pound class.

This study is based upon the comparison of the total high school career weight gains of the weight-makers, numbers one, two, and three, and the non-weight-makers, numbers nine, ten, and eleven.

Each boy's weight is recorded each year when he enters school in September and again when school closes in May. If a sophomore enrolls in wrestling in September weighing one hundred and thirteen pounds, and then weighs one hundred and nineteen pounds in May when he graduates three years later, his total high school gain is six pounds. Or, if a junior enrolls in wrestling for the first time in September weighing one hundred and twenty-six pounds and graduates two years later weighing one hundred and fifty-four pounds, his total high school gain is twenty-eight pounds.

These are typical cases. The sophomore was a non-weight-maker and averaged two pounds per year while the junior was a weight-maker and his average yearly weight gain was fourteen pounds.

Boys in the heavy weight class were excluded because there is no weight reduction in that division. Very few one hundred and sixty-five pound boys were used because not many boys of that size enroll in wrestling. They prefer football and field events in track.

No one year wrestlers were used. A boy had to partici-



pate two, three, or four years in the program before his record was eligible for use in this study.

CONDITIONS RESPONSIBLE FOR THE NEED  
OF WEIGHT GAIN COMPARISONS

The comparison in weight gains between weight-making and non-weight-making high school wrestlers, used in this study, was made in order to furnish tangible evidence that weight-making does not interfere with physical development.

Before making this comparison however, it appeared advisable to present, briefly, a few of the related or background conditions which gave rise to the need for the comparison.

In dealing with these related conditions, no attempt has been made to establish the order of importance because they are interdependent. For convenience, they have been listed as follows:

First condition, high school wrestling, used as a means of securing maximum physical development. The need for physical development is presented in a succeeding chapter.

Second condition, weight-making, used to secure maximum efficiency in wrestling. Methods of making weight are presented in a separate chapter.

Third condition, the attitude differences of coaches and parents, toward weight reduction, which results from the different interpretations of the term weight-making.

High school wrestling coaches, in addition to their regular class room work which may be anything from physical education to geometry, are engaged in an activity which has three separate phases.

The first phase is the instruction given to the members of the wrestling squad. Teaching the technique of wrestling to a group of high school boys is both an enjoyable and an intriguing experience. They rush into the locker room and engage in undressing and suiting-up contests to see who can be first to the mats. The eagerness with which they enter into their work-out is refreshing and the amount of energy they spend is amazing. They are ever on the alert for a new maneuver. Even the slightest suggestion from the coach is analyzed and carefully followed. Conditions of this kind are indeed conducive to coaching satisfactions.

The second phase is the interscholastic contest. When a high school coach has worked with a group of boys in preparation for a contest of wrestling skills, he feels the same pardonable pride which parents show when their child appears upon the stage during a fourth grade recital. Aside from the valuable lessons which may be learned by winning or losing a contest, very little importance is attached to the results, except by the young or overly ambitious coach. But the pride a coach feels when his boy can leave the mat with his chin up, win or lose, contributes immeasurably to his coaching satisfactions.

The third phase is the worry caused by criticism of conditioning procedures. From the standpoint of the high school wrestling coach, weight-making and its related problems are responsible for almost one hundred per cent of all unpleasantness connected with the sport of wrestling.

High school wrestling coaches are severely and often unjustly criticised during wrestling season for permitting boys to reduce their weight while trying to make the wrestling team. Criticisms of this kind are usually made by parents of boys who contemplate a reduction in weight (and occasionally by administrators) or, by people who specialize in rendering unsolicited opinions.

It is easy to understand why parents become alarmed when they first learn that their boy is trying to reduce his weight. Most parents are prone to either coddle or coerce their children into eating all that their little stomachs will hold. The heavy eater is supposed to grow up to be a big strong man.

Some parents are openly hostile toward weight-making and they immediately take steps to change the boy's schedule to some other branch of physical education. Other parents call the wrestling coach on the phone and explain that, while wrestling is a very desirable form of physical activity, they do not want their boy to reduce his weight in order to participate. While a few parents allow the boy to make his own decision regarding weight-making, their manner toward the wrestling coach is plainly that of distrust.

It is indeed a distressing predicament for the wrestling coach who loves the comradeship of the work-out sessions, enjoys the exhibitions of wrestling skills in interscholastic contests, has the respect, admiration, confidence, and loyalty of every boy on the team, yet is unable to dissipate the atmosphere of distrust which surrounds all parents.

The giver of unsolicited advice on the dangers of weight-making must not be taken too lightly. This person can sit on the side line just one afternoon and ruin a wrestling set-up, because the powers of suggestion would incubate many misgivings in the minds of his listeners. His opinions carry weight in direct proportion to his reputed importance in the community, regardless of his utter lack of scientific information on the subject.

Many of the before mentioned satisfactions are required to counter-balance conditions of this kind, and it was due to a sincere desire on the part of a wrestling coach to improve the situation as related in "condition number three," "phase three," that the comparisons used in this study were made.

## THE IMPORTANCE OF THE PROBLEM

Whether or not a boy reduces his weight two pounds in order to compete on a high school wrestling team does not appear to be a very important matter to the casual observer. Neither does the fact that a weight-maker actually gains more pounds than a non-weight-maker over a two, three or four year period. The importance of a problem to an individual increases in direct proportion as its effects tend to change that individual's present status or future plans.

The importance of a problem to an individual may not at first be recognized due to prejudices, (handed down from oldsters) lack of scientific information, or commercialized misinformation. For example:

## CASE "A"

Richard Smith was trying to develop his physique by doing everything on the program as outlined by his coach. Boys are like that. They are anxious to reach their maximum physical possibilities. With this development comes a wholesome desire to surpass the physical achievements of their predecessors.

Mrs. Smith changed Richard's schedule and his life. She changed him from a situation in which hard work, strict diet, and self-restraint were essential, to one in which these factors were not mandatory. Richard resented the change, at first, but with the bonds of self-restraint removed and with no training hours to observe, his night life contacts were soon made and late hours increased. Richard

began to deride his former wrestling partner for doing all that hard work and missing all the fun. Richard was a changed boy.

Mrs. Smith called the wrestling coach again late in Richard's senior year, this time pleading, "Can't you do something?" and, "Oh, if I had only understood what you were trying to do for him two years ago." Richard was sent to the State Reform School.

#### CASE "B"

Richard's wrestling partner. Same weight, build, temperament, physical achievement prospects, economical status, and physical development ambitions. The partner became a member of the high school wrestling team and gained state-wide recognition for his wrestling ability. He also developed a wonderful physique. Later, he became a star wrestler on one of the nation's outstanding college teams.<sup>1</sup>

The examples, case "A", and case "B", are neither imaginary nor overdrawn. They are employed here merely to show that Mrs. Smith failed to recognize the importance of that insignificant two pound reduction in weight, problem.

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1 Out of the eighty-two wrestlers who have graduated from Tulsa Central High School during the last thirteen years, seventy-three have entered some college or university, and because of excellent wrestling ability have been given part time employment to help finance their college careers. The remaining nine boys entered the industrial world direct from high school.

## PHYSICAL DEVELOPMENT

In considering what constitutes normal growth and physical development, it has been found necessary to consider carefully what is implied by the term normal, and in what sense it may properly be employed. It does not mean simply the usual or the average, and neither does it mean the best, although it ordinarily carries a connotation of all these ideas. The most important meaning which is to be attached to it here is the absence of ill health or incapacity.<sup>1</sup>

To avoid confusion it might be well to define growth and physical development in terms which the average parents most commonly employ.

Growth, (a condition which is taken for granted by most parents) simply means growing up, getting larger, the process of becoming an adult.

The more or less technical term, physical development, is seldom used by parents and the rarity of its use makes for ambiguity. There is a purely organic physical development and a neuro-muscular or skills development, but since they are seldom separated in planned programs, they will be considered together in this study.

Average parents are anxious to see their children grow up. However, some parents are not satisfied with the simple 'trust to luck' growing up process, but insist that their children be given the opportunity for proper physical development because they realize that the relationship of all well developed muscle groups results in beauty, symmetry, and efficiency.

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1 Hardy and Hoeffler, Healthy Growth, The University of Chicago Press, 1927, p. 75.



If, in just growing up, we could become as well developed as our fore-fathers, we would still have the physical proportions and stamina of the Gauls who could charge down the hill side at dawn in full armor and, carrying a heavy shield and battle ax, race at top speed across the plain for a mile to meet the foe and fight hand to hand until death or darkness forced a cessation.

Nature endows progeny only with potentialities. Each succeeding generation is compelled to develop its own stamina. Stamina is a by product of physical development and can be obtained by meeting the demands of a severe environment, and by rational planning. In ancient times there was very little planned development.<sup>2</sup> As man subdued his environment his progeny became less rugged. The Pilgrims, when they sailed from England, were not as rugged as were the Saxons. Many of the Pilgrims died from hardships and exposure during their period of readjustment to the new pioneer life.

Today, the two methods of developing a physique are; the unmolested method, or natural maturation, which merely provides nourishment and favorable environment, and the planned method which maps out the course so carefully that every moment of the youngster's life may be assigned to a definite place on the development schedule.

Since the unmolested method has so completely overshadowed the planned programs in the past, it will be

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<sup>2</sup> The Olympic games, held in Athens, Greece, was a step in that direction.

fitting to point out reasons for this condition.

The Pilgrims, like the ancients, were too busy fighting the Indians and the elements to think about developing the physiques of their off spring in a scientific way.

Then again, the wholesome food and the exercise taken while hunting and performing the duties which their environment demanded, offered an excellent opportunity for development. So long as our fore-fathers lived under circumstances of this kind, the unmolested method apparently filled the need. But conditions changed. As time passed, more and greater changes took place and with those changes came the need for a planned program of physical development.

Like most other needs which result from changes, the need for planned physical development was not abrupt, nor was it universal. Many descendants of the pioneers are still doing hard labor and eating plain foods. They are, of course, well developed. Also, many people whose active ancestors are not so far removed that they have had a chance to lose ground, fallaciously assert that they do not need to be any stronger. They ride to work and work with a pencil, so why be concerned about a powerful physique?

Taken as a whole, the present generation can not match the stamina, the beauty of those rippling muscles, nor the virility, which belonged to our fore-fathers.

Once an insight is gained concerning our physical trend, the planned program of physical development tends to lose its drudgery. The harmonious development of the physique

and the building up and broadening out of the highest type of manhood alone, generally offers a worthwhile inducement.

In view of the fact that our conditions have so changed that all classes of our people can not afford to risk letting their children develop by the unmolested method, physical education specialists are now attempting, by scientific study and careful planning to give to future Americans that physical perfection which once belonged to the Greeks.

Planned physical development should begin in early childhood. Expending a major share of one's physical energies, is nature's method of securing physical development.

Late in the nineteenth century, planned physical development programs were included in the curricula of the larger universities. The records at those universities show that even in the days of strong men, a well planned program made strong men stronger, fast men faster, and improved the co-ordination of every one.

Sargent's physical development charts, as a whole, indicate that the first and most marked changes produced upon the physique by the participation in these planned physical development programs are shown in the weight, girth of chest, arms, thighs, breadth or shoulders, and the increased strength of all parts of the body.<sup>3</sup>

The planned program of physical development is based upon four fundamental principles:

First, plenty of work. This fundamental is emphasized in an earlier paragraph which suggests expending a major share of one's energies in order to secure proper development.

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3 Sargent, D. A., Athletic Sports, Charles Scribner's Sons, 1897, p. 55.

Second, plenty of rest. Rest usually comes in the form of sleep which is a fundamental function and is governed by our inherited nervous system, yet may be influenced by the chemical man and by the emotional man.

Third, proper diet. This subject will be presented in a succeeding chapter.

Fourth, self-restraint. Failure to rigidly practice self-restraint will render the other three principles ineffective.

## WEIGHT-MAKING

In this chapter on weight-making, attention is directed to the fact that only fat is being dealt with - not building material.

Barring exposure and famine, very little fat is actually needed on the body, but any reference to weight-making in connection with their son produces an unfriendly gleam in the eyes of parents.

The term, weight-making, while not exactly a misnomer, is almost universally misinterpreted. When a boy tells his mother that he took off three pounds of weight in two afternoon workouts, his mother interprets the present situation in terms of her past experience and compares the three pounds her son has lost with a three pound roast she has in the refrigerator. As a result of this misinterpretation the maternal protective instincts immediately change the unfriendly eye gleam into berating epithets which accuse the wrestling coach, who would permit such an atrocity, of everything from ignorance to modified mayhem.

In most cases (glandular, and other disturbances excepted) the amount of fat deposited on the body will indicate the difference between the amount or quality of food consumed and the units of energy expended.

How much fat should the high school boy carry? The parents have no standards, "Just so he looks healthy," is the customary answer. Would two or three additional pounds cause the parents any great amount of anxiety? Probably not.

Would a two or three pound reduction? In the majority of cases, any loss in weight by the boy is a cause for alarm and the cause or justification of the loss is never considered. According to Mrs. Smith's standard, Richard did not look as healthy as he did before he began to lose weight.

Standards (although unreliable) were adopted when public schools first began to sponsor health programs. They used the height-weight charts as a yard stick.

The scale in every school and the use of the height-weight charts as a device for interesting the child in his physical well-being, have become basic elements in the modern plan.<sup>1</sup>

The height-weight charts, so religiously adhered to by the teacher, were merely medians taken from thousands of measurements which were made without regard to ancestry, region, or economic status and proved to be unsatisfactory. (see footnote)

According to these fallacious height-weight charts, practically all of our western type American boy athletes are several pounds under weight, even though they carry from four to six pounds of fat and are in perfect health.

The parent's hostile attitude toward weight-making generally arises out of the foregoing items of mis-information and mis-understanding.

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1 Winslow and Williamson, The Laws of Health and How to Teach them, Charles E. Merrell Co., New York, p. 58.

Footnote:

Paradoxically, a person using a height-weight chart, discovered that a slender grey hound puppy did not weigh as much as a heavy muscled bull dog puppy. The grey hound was placed on "a quart of milk a day" diet and not permitted to run and play.

Methods of Making Weight. Many coaches affect a reduction in weight of their athletes by one or more of the following methods: complete change of diet, partial change of diet, reduction in the amount of food consumed at each meal, eating only one (or two) meals per day, substituting liquids for solid foods.

Recent discoveries and improved methods of measurements have contributed many changes to the field of nutrition since the time when records on this subject were first preserved. In 1529 for example, the Mayor of Guilford, England, ordered that,

The brewers make a good useful ale. That they sell none until it be tasted by the "Ale Taster" who was charged as follows: "You shall at all times try, taste, and assize the beer and ale to be put on sale in this liberty. Whether it be wholesome for man's body, and present those that offend or refuse to suffer you to assay it, to this court."<sup>2</sup>

This unscientific approval may have been the forerunner of our present food and drug laws, but it is used here to show how advice concerning diet has changed from a matter of subjective judgment to a judgment based on laboratory results. Today, new discoveries are frequent and individual needs are stressed. There are a number of perfectly good foods which are good enough for some people but positive poison to others, such as strawberries, onions, and shell fish.<sup>3</sup> Along with new scientific knowledge came

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2 Hale, G. E., Foods, Their Composition and Analysis, Charles Griffin, Limited, London, 1926, p. 8.

3 Moore, H. H., Keeping in Condition, The MacMillan Company, 1931, p. 39.

methods of preventing the accumulation of any appreciable amount of fat on the body.

Dr. C. M. McCay, Dr. L. A. Maynard, and Dr. G. Sperling, scientists of Cornell University, Ithaca, New York, report that:

"In regard to recent nutrition developments, the addition of thirty or more years to the life span of man is made possible by diet changes. This stretching of the traditional three score years and ten is possible by restricting the high energy foods eaten in the early years of life and living more slowly. It has been estimated that the results of medical research have added several years to corresponding experimental life.

Working with rats, which are comparable to man in their utilization of food, the Cornell Scientists found that the usual two year age of the animals could be stretched to three by cutting down the calories, only while the rats were young. These rats were apparently in good health at the end of three years, long after their brothers and sisters, who had all they could eat, had died. Furthermore, the low calorie rats developed few cases of hardening of the arteries, one of the most common and most fatal diseases of old age.

These studies provide evidence that the rate of attainment of maturity is an important factor in pre-determining the span of life.

This challenges the common concept that rapid growth develops the best bodies for long life."<sup>4</sup>

The average parents however, will not listen to any explanation, by a wrestling coach, of weight (fat) reduction or prevention and would be unimpressed if they did. It is impossible to convince parents that a reduction in weight (fat) does not mean a pause in structural development.

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4 Dr. C. M. McCay, Dr. L. A. Maynard, Dr. G. Sperling, reporting before the American Institute of Nutrition, Fifth Annual Meeting, Baltimore, Maryland, March 30, 1938.



Another Method of Losing Weight, used by a number of coaches, is dehydration. This is usually accomplished by using a steam bath, a hot water bath, the sweat box (usually heated by a battery of electric light bulbs), massage, or the consumption of no liquids.

If properly handled, some of these devices for affecting dehydration may be employed with perfect safety. The over use or abuse of any method may, of course, prove to be harmful to the boy.

The Carry-over Effects of Weight-making. All of the reputed harm done to a wrestler is supposed to occur during the conditioning period while making weight, and not during the actual wrestling contest.

There is no scientific evidence on record which shows that weight-making will be followed by physical infirmities in later life.

On the other hand, it is a matter of record that wrestling was man's first form of sport. If the training for wrestling leaves the body with so many permanent disabilities, it would appear that some one down through the ages would have pointed out this fact.

It is a matter of record that wrestlers workout more times during the year, for longer periods each day, and at nearer top speed during the workout than participants in any other form of personal contact sport. If wrestlers are weakening themselves and acquiring permanent physical disabilities during these severe workout or conditioning periods, it would appear logical that wrestlers as a class

would degenerate physically.

It is a matter of record that wrestlers can compete more frequently and remain near the top in their profession many years longer than contestants from any other contact sport. Performances of this kind do not indicate conditioning deterioration.

Zybysko, at the age of fifty-six, was the most formidable of any professional wrestler. The carry-over effects of wrestling in his case were considerably delayed.

In 1928, a nineteen year old boy at Tulsa Central High School, reduced his weight from one hundred and fifty-one pounds to one hundred and forty-five pounds and won the state and national wrestling championships at that weight. During his conditioning period he received much free advice and was frequently warned that his growth would be stunted. Ten years later this same boy was having trouble in reducing his weight from one hundred and eighty-five pounds down to one hundred and seventy-five pounds in order to defend his title of Light Heavy Weight Champion of the World.

There is no way to forecast the break down time of any organ in the human body.

High school wrestlers are not given a thorough physical examination when they first enter the sport. It is possible that some of them had tuberculosis and kidney ailments before they ever engaged in wrestling.

Deprivations and hardships suffered by pioneers who settled in the north country, whose children sometimes had only a few spoonfuls of mush each meal, for periods of six to eight weeks during the winter freeze-up, left

no recorded evidence that permanent harm had been done. When proper food became available, the emaciated children responded immediately and at maturity were as fine physical specimens as their ancestors.

Degeneration of the kidneys is more often a result of a general disease such as typhoid fever than any temporary deprivation.<sup>5</sup>

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5 DeGrovanni, Dr. A., The Morphology of the Human Body, Rebman, Limited, London, 1927, p. 402.

## SUMMARY

First, Weight-making as used in this study means the prevention of accumulation, or the removal of fats or water from the physique.

Second, due to a lack of information, parents interpret a loss in weight to mean a pause in structural development.

Third, The use of the height-weight charts as a criterion of health conditions is absurd.

Fourth, recent laboratory experiments show that a diet, free from rich foods (such as the one which has been used by the wrestling coach for years) produces better physical specimens and increases materially the life span.

Fifth, there are two methods of weight-making in general use today, diet and dehydration.

Sixth, no definite evidence has ever been produced to show that weight-making is followed by harmful carry-over effects.

## WEIGHT GAIN COMPARISONS

The weight gain comparisons between weight-making and non-weight-making high school wrestlers used in this study, were made from a sampling of the anthropometric records at Tulsa Central High School which cover a period of thirteen years under the writer as coach.

The term weight-making is used in lieu of an explanation of the training procedures which reduce the amount, or prevent the accumulation, of fat on the body of high school wrestlers during the wrestling season.

The term weight-makers will be used to designate the top ranking wrestlers in each weight class who are making weight.

Non-weight-makers will be used to designate the bottom ranking wrestlers in each weight class who do the same amount of work but do not indulge in weight making.

The weight class limits as outlined by the official rule book<sup>1</sup> for high school wrestlers are shown in table number one.

Table 1.      Weight Class Table.

	95 pounds and under		
105	"	"	"
115	"	"	"
125	"	"	"
135	"	"	"
145	"	"	"
155	"	"	"
165	"	"	"
	Heavy weight.		

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1 op. cit.

If a boy who weight one hundred and twenty-nine pounds wishes to wrestle in the one hundred and twenty-five pound class, he would have to reduce his weight four pounds. Engaging in these reduction procedures would identify him as a weight-maker.

If a boy who weighs one hundred and twenty-nine pounds decides not to reduce his weight, but instead, wrestles in the one hundred and thirty-five pound class, he will be referred to as a non-weight-maker.

The meaning of top ranking and bottom ranking wrestlers may be explained in the following ranking positions for the one hundred twenty-five pound class:

Ranking Number	Boy's Name.	
1 - - - - -	-Henson	Top ranking boys or Weight-makers
2 - - - - -	-Benson	
3 - - - - -	-Combs	
4 - - - - -	-Stone	
5 - - - - -	-Byrd	
6 - - - - -	-Johnson	
7 - - - - -	-Jones	
8 - - - - -	-Williams	
9 - - - - -	-Miller	Bottom ranking boys or Non-weight-makers.
10 - - - - -	-Holland	
11 - - - - -	-Campbell	

Henson ranks number one in the one hundred twenty-five pound class; in other words, he can defeat all of the other boys in this weight class. Benson ranks number two and is the next best boy in the one hundred twenty-five pound class, etc.

Methods of Procedure, This study is based upon the comparison of the total high school career weight gains of the weight-makers (number one, two, and three) and the non-weight-makers (number nine, ten, and eleven).

Every boy's weight was recorded each year when he entered school in September and again when school closed in May. If a sophomore enrolls in wrestling in September weighing one hundred and thirteen pounds and weighs one hundred and nineteen pounds in May when he graduates three years later, his total high school gain is six pounds. Or, if a junior enrolls in wrestling for the first time in September weighing one hundred and twenty-six pounds and weighs one hundred and fifty-four pounds two years later when he graduates, his total high school gain is twenty-eight pounds.

These are typical cases. The sophomore, a non-weight-maker, averaged only two pounds per year while the junior was a weight-maker and averaged fourteen pounds per year.

Similar records and comparisons over a period of thirteen years should be of value.

Table number two shows the weight gains for the top-ranking weight-makers.

WEIGHT--MAKERS

Name	Number of Years Wrestled	Entrance Weight	Final Weight	Total Gain	Average Yearly Gain.
Arndt	2	97	126	29	14½
Bartlett	2	144	168	24	12
Baxter	2	128	144	16	8
Benson	2	126	154	28	14
Byrd	3	91	128	37	12 1/3
Byrd	3	108	137	29	9 2/3
Bell	3	106	126	20	6 2/3
Combs	2	121	144	23	11½
Henson	4	86	146	60	15
Hall	2	97	114	17	8½
Hedge	2	143	164	21	10½
Hocker	2	84	109	25	12½
Johnson	4	109	146	37	9½
Jenkins	3	108	142	34	11 1/3
Jones	2	156	167	11	5½
Jones	2	139	146	7	3½
Jennings	2	112	126	14	7
Kitt	3	102	127	25	8 1/3
Knight	3	142	156	14	4 2/3
Logan	3	118	152	34	11 1/3
Lindsey	2	116	127	11	5½
Mason	3	94	127	33	11
Maxwell	3	116	139	23	7 2/3
Mehlhorn	4	89	132	43	10 3/4
Musser	2	89	121	32	16
McDonald	2	76	104	28	14
Moskowitz	2	107	131	24	12
Menkoff	2	122	144	22	11
Olson	2	142	172	30	15
Peck	3	132	154	22	7 1/3
Pilkington	2	141	154	13	6½
Peck	2	100	131	31	15½
Puryear	2	126	142	16	8
Poulos	3	97	144	47	15 2/3
Rhodes	2	107	131	24	12
Sparks	3	98	128	30	10
Smith	2	154	163	9	4½
Wilson	3	144	162	18	6
Utter	2	133	156	23	11½

Table 2.



The individuals of the entire weight-making group held their weights down to the weight class limits, as prescribed by the official rule book,<sup>2</sup> through out the wrestling season each year during their high school careers of two, three, and four years.

According to popular belief, this is the group which, due to the deprivations of weight-making, are to be stunted and other-wise harmed for the rest of their lives.

The figures show that the average weight gain per year was ten and two-thirteenths pounds per boy.

The figures which show the average yearly weight gains of the bottom ranking wrestlers or non-weight-makers, will be found in table number three.

This group of non-weight-makers would report to class along with the weight-making group, get the same instruction, work out just as faithfully, engage in ranking matches to improve their position on the ranking list, and observe the same rules of self restraint. There was no difference in the daily program of the two groups except, the non-weight-makers suffered none of the deprivations of weight-making. They could work hard and eat and drink as much and as often as they chose and grow without running any risk of being stunted.

But the records show that the average yearly weight gain for the non-weight-makers is only three and one-tenth pounds, as compared with a gain of ten and two-thirteenths pounds which was made by the weight-makers.

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2 loc. cit.

NON-WEIGHT-MAKERS

Name	Number of Years Wrestled	Entrance Weight	Final Weight	Total Gain	Average Yearly Gain.
Armstrong	3	135	148	13	4 1/3
Berger	2	108	118	10	5
Burk	2	113	116	3	1 1/2
Campbell	2	128	132	4	2
Clark	2	164	168	4	2
Conner	2	121	126	5	2 1/2
Colvin	2	109	117	8	4
Carmen	2	154	158	4	2
Daley	3	77	100	23	7 2/3
Dyer	2	108	112	4	2
Epperson	2	138	144	6	3
Galvan	2	129	134	5	2 1/2
Gwin	2	152	164	12	6
Goodell	2	154	159	5	2 1/2
Hughes	3	113	119	6	2
Holland	2	126	131	5	2 1/2
Horrell	2	118	121	3	1 1/2
Hudson	2	100	109	9	4 1/2
Jones	2	169	176	7	3 1/2
Cook	2	142	148	6	3
Lucas	2	96	101	5	2 1/2
Levy	2	156	162	6	3
Lairmore	3	148	154	6	2
Miller	2	124	132	8	4
McDaniel	2	98	104	6	3
Moguin	2	126	127	1	1/2
McRaven	2	111	123	12	6
McCuen	2	139	144	5	2 1/2
McQuaig	2	129	134	5	2 1/2
Porter	2	103	109	6	3
Pollock	2	147	156	9	4 1/2
Ross	2	106	111	5	2 1/2
Ridgway	2	108	116	8	4
Roberts	2	134	136	2	1
Suddath	2	99	106	7	3 1/2
Swope	2	99	102	3	1 1/2
Simpson	2	76	84	8	4
Spurgin	2	104	114	10	5
Williams	3	134	138	4	1 1/3
Young	2	167	168	1	1/2

Table 3.

## SUMMARY OF CONCLUSIONS

The data included in this thesis makes possible the following conclusions:

First, that the conditioning program of high school wrestlers is based upon hard work, rest, proper nourishment, and self-restraint.

Second, that due to our present mode of living, a scientific program of physical development is imperative.

Third, That the size, shape, and structure of the body have a direct dynamic relation to all the vital organs and appreciably influence the functions of the brain and nervous system, is axiomatic.

Fourth, that in securing maximum physical development, a major share of energies must be expended.

Fifth, that the strenuous training program of the high school wrestlers demands that they enter into it with all the energy they are capable of mustering.

Sixth, that due to prejudices and lack of information the conditioning program of high school wrestlers is often condemned by people who are not qualified to pass judgment.

Seventh, that most of the condemnation of the conditioning programs originated with the misinterpretation of the height-weight charts.

Eighth, that instead of using height-weight charts, the schools which sponsor health programs should give a

each child a physical examination for cardiac and other functional disorders, tuberculosis, etc. Cases which need medical attention should be isolated and treated and malnutrition cases would then be confined to the under-nourished only.

Ninth, that while sleep is a fundamental function it is influenced by the chemical man (diet) and the emotional man (self-restraint).

Tenth, that man's life span may be extended by keeping the diet free from over rich foods, especially during youth.

Eleventh, that the over rich diet renders practically useless the body's lysozyme like defenses.

Twelfth, that the self-restraint program is almost puritanic, thus the training of the will is added to the training of the physique and the lessons in self mastery contribute no little to the formation of the individual's character.

Thirteenth, that according to the records of weight gain comparisons, which cover a period of thirteen years at Tulsa Central High School, the wrestlers who follow the scientific type of conditioning program out gain the wrestlers who do not.

Fourteenth, that information of this kind should be made available to parents and others who may be interested.

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