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A test and a comparison of the effects of the prevailing physical education programs in the Terre Haute, Indiana high schools

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A TEST AND A COMPARISON OF THE EFFECTS OF THE PREVAILING PHYSICAL EDUCATION PROGRAMS IN THE TERRE HAUTE, INDIANA, HIGH SCHOOLS

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"If I were talking to an athlete, I would say, show me your shoulders; then he might say here are my Halteres. I reply, Slave, I am not inquiring about this, but how you exercise pursuit and avoidance, desire and aversion, how you design, and purpose, and prepare yourself, whether conformably to nature or not. If conformably, give me evidence of it, and I will say you are making progress." --- The Discourses of Epictetus.

CHAPTER I

THE PHILOSOPHY OF PHYSICAL EDUCATION AND THE PROBLEM

I. THE PHILOSOPHY OF PHYSICAL EDUCATION

Many and varied are the philosophies of physical education. But basically all are the same. While in some fields philosophy plays a relatively minor role, its part in physical education is integral, indispensable, and never absent.

Each man whose business is physical education must have his own particular philosophy--code of ethics or conduct--which must govern and guide his actions and principles. This may be his own or that of one of the great masters. But it must be existent--an ever guiding light by which he may lead the youth of our nation along the portion of that long path of life of which he is the guardian.

The many philosophies of physical education start with no less an agent than our national government. The report of a national committee of the American Association for Health, Physical Education, and Recreation, a Department of the National Education Association, formed a platform of ten cardinal points. This is a good example of basic philosophy:

An adequate education will include worth-while experiences in health, physical education, and recreation. Not only the concept of the organism but also the clear recognition of the inter-relations between organism and environment, require that this education, if it is to be adequate, must concern itself with facilities, program, and leadership. This may be accomplished through the development of:

1. The comprehensive health protection program of children, including an adequate health examination, control of communicable diseases, and healthful school living in the entire curricular and extra-curricular life of the school, directed toward the educational goal of developing capacity for self-direction in health matters.
2. Health instruction based upon scientific materials progressively arranged throughout the grades and upper schools, and directed toward personal accomplishment and social ideals.
3. A physical education program for all pupils every day, using activities that are educationally sound as well as developmentally desirable, progressively graded, and adapted to meet individual and group needs.
4. Opportunities for the development of skills and interests in recreational hobbies that may range the entire curriculum...
5. Adequate indoor and outdoor facilities and sufficient time in the curriculum for all parts of the program, properly prepared personnel, and organization of pupils to permit the development of good instructional programs.
6. Procedures for the scientific classification, grading, and promotion of pupils in harmony with the best practice in general education.
7. The organization of health, physical education, and recreation in the schools as a single, executive department, utilizing community and school effort and resources in the establishment of common purposes and policies as to finance, use of facilities, and cooperative working relationships among the personnel involved, all directed toward and thoroughly integrated with the general purpose of education.
8. The accreditment of health, physical education, and recreation activities in all schools and colleges for graduation and acceptance from high school for college entrance.
9. Extension of the desirable and practical measures for the promotion of health, physical education, and recreation among boys and girls in schools to all members of the community, as the broader implications of education are accepted, and as the ideas of play and recreation as

aspects of the finest living gain recognition.

10. Professionally educated and adequately accredited administrators, supervisors, teachers, and specialists for all aspects of the health, physical education, and recreation programs. ...[1]

From the one extreme of philosophy of a large well organized group to the other extreme of one man, Jesse F. Williams says his piece:

> Physical education should endeavor to provide leadership and adequate facilities which will afford an opportunity for the individual or group to act in situations that are physically wholesome, mentally stimulating and satisfying, and socially sound.
>
> By 'physically wholesome' it is meant in general that situation that is good for a man as determined by scientific knowledge, or that is shown clearly by experience. This will mean control of the environment as regards sanitary matters, such as air, dust, cleanliness, communicable diseases, etc. ...
>
> By 'mentally stimulating and satisfying' reference is made to situations which provide necessity for thinking in relation to the activity, and which gives satisfaction as the end-result of the activity that has been going on. ...
>
> By 'socially sound' is meant that physical education should make adequate provision for the appearance and development of moral and social values. ...
>
> Unless physical education results in socially useful conduct it has no right to the term education.[2]

Another philosophy of renown is that of Jay B. Nash of New York University. It is given in the following paragraphs:

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[1] Committee of the American Physical Education Association, "Ten Cardinal Points in the Platform of Physical Education," Journal of Health and Physical Education, 64:14, September, 1931, Cover Title.

[2] Jesse F. Williams, Principles of Physical Education (Philadelphia: W. B. Saunders and Company, 1932), pp. 251-3.

Physical education is the administrating or teaching division of education that is concerned with the vigorous total body activities, the muscular mechanisms functioning as well as the neuro-affective mechanisms, as distinct from the manual, musical, or scientific activities.

This all comes about through a series of developments, one of which is organic development. This type of development refers to the ability of the organism to acquire vitality through training. As synonyms we might use the words vital reserve, endurance, resistance to disease.

. . . . . .

The second great objective of physical education is its contribution to impulsive development. By impulsive development is meant all the impulses in behavior--all the hungers, interests, desires, ideals, attitudes that make one act.

. . . . . .

Two more objectives to be considered which result from activities are: menti-motor and interpretive. ...

Interpretive development has to do with sizing up a situation and bringing in all past experiences which relate to the subject and culminate in making a decision . ...

Menti-motor development has to do with the carrying out of the act which follows the judgment.

. . . . . .

The aim of physical education is to bring life and this more abundantly. It offers a program built upon the platform of science and dedicated to a fearless realism which has as its aim the attainment of pragmatic results. It is resolutely determined not to savor of the nom de plumes ending in ists and isms and to avoid growing into a cult or succumbing to any variety of cleverly disguised quackery.

Physical education faces the world and life believing in mankind and offering to humanity a program which will bring it a more balanced life, a freer mind, and a more daring and courageous spirit.[3]

Hetherington, of Stanford University, a recognized philosopher of the physical education profession, has had such varied and wide experience as to become one of the foremost authorities on this subject. As to his philosophy, he

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[3] John B. Nash, Interpretations of Physical Education (New York: A. B. Barnes and Company, 1931), pp. 3-29 and 240.

says:

> ...That phase of education which is concerned with first, the organization and leadership of children in big muscle activities, to gain the development and the adjustment inherent in the activities according to social standards; and, second, with the control of health and growth conditions naturally associated with the leadership of the activities so that the educational process may go on without growth handicaps.
>
> . . . . . .
>
> Big muscle activities have inherent in them the exercise of the deepest and most powerful character forming emotional tendencies in human nature and they furnish the richest source of fundamental moral situations in the social relationships of children and youth.[4]

To think of modern conditions, scarcely over a hundred years old, as set, leads at once to the offering of substitutes to make up for the defects of opportunity. The business of physical education is to establish the needs of our youth, needs that have existed for at least fifty thousand years, and help to make clear the needs of happy, healthy adults. Another of our philosophers, Howard Savage, voices his opinion:

> ...a new conception of the whole thing (physical education) as it affects public school life and relations is gaining ground. Briefly, it is to the effect that physical training and athletics are parts of physical education and that physical education is, in turn, a component of a larger field of school hygiene, which includes nutrition, medical and dental supervision, posture and education in human reproduction and development..

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[4] Clark W. Hetherington, School Programs in Physical Education (Yonkers-on-Hudson, New York: World Book Company, 1922), p. 5.

[5] Howard J. Savage, and others, American College Athletics. The Carnegie Foundation for the Advancement of Teaching, Bulletin 23, New York: 1929, p. 56.

Dr. Eugen Matthias of the University of Munich points out that there are countless deviations between the concepts of physical education "only as an anatomically functioning muscle exercise" and the concept of it "only as a medium of expression." He claims that neither concept is entirely correct, neither entirely wrong and that we must "consider physical education as it affects the body and then consider the effects as they manifest themselves upon the soul experiences of man."[6]

President Meader of Russell Sage College summarizes his ideas in the form of two objectives:

> 1. The training of a perfectly functioning human being, physically strong and well poised, organically sound and efficient, mentally alert and forward looking, emotionally well-controlled and well-balanced.
> 2. The education of a cooperative, creative, serviceable member of society with ideals, attitudes, habits, and standards of living which make for bigger, broader, more tolerant, more interesting, more helpful, and more creative men and women.[7]

Bertrand Russell declares that "physical education in the form of play and pretense are a vital need of childhood, for which opportunity must be provided, if the child is to be happy and healthy, quite independently of any further

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[6] Eugen Matthias, The Deeper Meaning of Physical Education. Translated by Carl Schrader (New York: A. S. Barnes, 1929), pp. 5-6.

[7] J. L. Meader, "Physical Education and Enriched Living," Journal of Health and Physical Education, 14:363, June, 1936.

utility in these activities."[8]

Mable Lee, Professor of Physical Education, University of Nebraska, says,

> "Physical education has been a leader in the movement for the development of the individual according to his own needs and capacities. Its programs of testing and measuring, of examining and classifying, of offering individual instruction and opportunities for student leadership are but a part of its contribution in this direction."[9]

In view of the fact that physical education affects social, economic, and religious influences, different philosophies arise. In light of the aims of education in a democracy, it seems that physical education should accomplish certain definite results in the school. The indications are that these outcomes should have particular categories on which to concentrate and develop in the highest degree to gain maximum affectiveness.

In support of this idea Jackson R. Sharman, University of Michigan, states his philosophy in the way of objectives:

> 1. To provide opportunities for controlled participation in physical activities that will result in educative experiences.

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[8] Bertrand Russell, Education and the Good Life (New York: Liveright Publishing Company, 1926), p. 123.

[9] Mabel Lee, The Conduct of Physical Education (New York: A. S. Barnes and Company, 1937), p. 8.

Such participation should provide experiences that insure wholesome expression and control of the emotions, desirable modification of instructive tendencies, development of social standards and ideals, wholesome self-expression, and a keener appreciation of the fact that each individual is dependent on other members of society for most of the satisfactions of life.

. . . . . .

2. To develop the organic systems of the body, to the end that each individual may live at the highest possible level.

It is recognized that the feelings, emotions, thoughts, and actions of persons are influenced to a considerable extent by the physiological processes of the body. The development of the organic systems of the body is accepted as a worthwhile objective because it seems to be true that one can live on a higher level and do better many desirable, interesting, and valuable things when the organic systems are functioning smoothly.

. . . . . .

3. To develop skills in activities and favorable attitudes toward play that will carry over and function during leisure time.

It seems to be a fact that people like to do the things they can do well. If a person during his childhood and youth has many satisfying and pleasant experiences in recreational activities, it is quite probable that he will develop attitudes toward play that will cause him to seek the opportunity to participate in these activities during his leisure time in later life.

. . . . . .

The aim of physical education is to influence the experiences of persons to the extent that each individual within the limits of his capacity may be helped to adjust successfully to society, to increase and improve his wants, and to develop the ability to satisfy his wants.[10]

There may be seen a close resemblence in the philosophies, especially those of Jesse Williams and Jackson Sharman, and in one degree or another in all the rest. This is only

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[10] Jackson R. Sharman, Introduction to Physical Education (New York: A. S. Barnes and Company, 1934), pp. 65-8.

one more item of assertion that the philosophy of physical education is basic, applicable, and serviceable. Among other men who have working philosophies of physical education are Edward Voltmer and Arthur Esslinger, who explain their ideas by means of objectives and criteria, many of which are in direct opposition to those already reviewed:

> 1. To assist in providing for normal growth and development.
> 2. To assist in developing and maintaining sound and proper functioning.
> 3. To assist in development of endurance sufficient to meet the demands of the stress of life and proper functioning.
> 4. To assist in developing strength to do normal life tasks without undue strain. ...Interesting exercise is a little more valuable from the standpoint of physical growth than uninteresting exercise but not enough to rate inclusion as a criterion.
>
> Physical growth is influenced little or none by doing tasks that are not satisfying--much of the labor of children is irksome.
>
> . . . . . .
>
> Psychological criteria do apply, that is, normal growth and development are attained more readily if individual differences are provided for and if certain elements are selected and stressed at times in physical education.[11]

Physical education is in part the responsibility of the home and the community, but there seems to be little doubt that the essential developmental contribution to the organized efforts in the field is the function of the schools. And who

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[11] Arthur A. Esslinger and Edward F. Voltmer, The Organization and Administration of Physical Education (New York: F. S. Crofts and Company, 1938), pp. 39-41.

could be in better position to shape the basic philosophy than the state departments of public instruction? An example is Indiana, which sponsors this philosophy:

> The aim of physical education is to facilitate that optimum growth and development of each individual which will afford the maximum adjustment to his physical, mental, and social situations today and in the future.[12]

In the early days of the past war the late President Franklin D. Roosevelt made this appeal, "I, therefore, call for the united efforts of government--federal, state, and local--of business and industry, of the medical profession, of the schools, and of the churches; in short, of all citizens, for the establishment of total physical and moral fitness."

In response to this challenge, Ben Miller, Karl Bookwalter, and George Schlafer, Indiana University, set up their philosophies to serve as a guide:

> The aim of physical education primarily is to make a unique contribution to the individual's optimum growth and development physiologically; and secondarily, to contribute to such psychological and sociological development and adjustments as is possible through participation in vigorous physical activities according to social and hygienic standards.
>
> The following statement of the purposes of physical education is made to include all relevant objectives, but in an orderly manner under a few general or key objectives rather than in an over-lapping, illogical list of synonyms.

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[12] State of Indiana, Department of Public Instruction, Physical Education, A Tentative Course of Study for Study for Junior and Senior High Schools, Indianapolis: 1940, p. 13.

1. Physical growth and organic vigor . . . . . .
2. Development of social traits and qualities of character . . .
3. Development of psychological powers . . . . . .
4. Development of recreational capacity . . . . . .
5. Development of safety capacity . . . . . [13]

No amateurs are N. P. Nielson and Winifred Van Hagen in the field of physical education. Their philosophy includes even the elementary schools. Not unlike their brothers, they state their philosophy in the medium of objectives:

1. Prevent handicaps and improve physical efficiency.
2. Improve the individual's posture.
3. Decrease mental strain and improve mental health.
4. Develop symmetry, control, and grace of body movement.
5. Develop ability to meet physical emergencies.
6. Develop alertness and quick response.
7. Develop an active response to rhythm.
8. Develop courage, self-control, self-sacrifice, courtesy, kindness, loyalty, obedience, honesty, cooperation, and initiative.
9. Create an intelligent interest in physical activity and give to him a fund of activity material for use in leisure time.
10. Create an interest in the physical welfare of others.
11. Promote the desire for wholesome associations and recreation.
12. Develop the proper spirit toward victory and defeat.
13. Develop good character.
14. Develop the qualities inherent in leadership.[14]

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[13] Ben W. Miller, Karl W. Bookwalter, and George E. Schlafer, Physical Fitness for Boys (New York: A. S. Barnes and Company, 1943), pp. 7-8.

[14] N. P. Nielson and Winifred Van Hagen, Physical Education for Elementary Schools (New York: A. S. Barnes and Company, 1932), p. 6.

One of the greatest problems of physical education, and probably its greatest one, is to find ways of inducing people to engage in more physical activity. To this end Wilbur Bowen has set his philosophy in purposes to be accomplished through physical education:

> 1. Knowledge and Skill in Activities
> Every physical activity has its mental side. In all games there are rules and strategy to learn before one can succeed as a player. Attention, alertness, and preparedness for emergencies are demanded everywhere in physical education. The development of these mental abilities is one of the main satisfactions of physical sport. . . .
> 2. Physical Development
> To keep the body organs functioning normally and to develop a reasonably vigorous physique, physical education must provide a large amount of activity of the large muscles. . . . Safety as well as efficiency is gained by keeping fit. . . .
> 3. Wholesome Recreation
> . . . physical education can secure results only through the voluntary activity of each individual. . . . The pleasure people have in an attractive activity is in itself health-giving. Pleasure increases digestion, assimilation, and all the normal functions necessary to health. . . .
> 4. Social and Moral Training
> Playing according to the idea that the rules of the game are for all to obey cultivates the habits of honesty, reliability, and friendliness.
> . . . . . [15]

Physical education is the sum of man's physical activities which arise out of man's needs as a human being and satisfy a real want. Jesse Williams says that the purpose of

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[15] Wilbur Bowen, The Conduct of Physical Activities (New York: A. S. Barnes and Company, 1929), pp. 4-9.

physical education is the development of the individual in different ways:

1. Development of the Organic System of the Individual Through Physical Activities.
2. Development of the Neuro-muscular System in General and Particularly in Relation to Control Over Certain Fundamental Skills.
3. Development of Certain Attitudes Toward Physical Activities, and Particularly Toward Play.
4. Development of Standards of Conduct.[16]

The formulation of a philosophy of physical education ought to grow out of a practice which is continually checked by principles. Philosophy and practice should be subjected to a constant correction, the one by the other, affording a reciprocal and necessary modification. The effort should always be made to provide actual activities to illustrate the principles presented and to find acceptable principles to justify the practice.

This parade of philosophy has as its primary objective the indoctrination of the layman who might come into contact with this work. Through these philosophies it is hoped that a true, distinct picture of physical education may be seen. Not unlike any other field, physical education has to contend with its quacks. Only through the philosophies of the masters can a mind-set occur with which to understand fully and appreciate the significance of this work.

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[16] Williams, op. cit., pp. xiii-xvi.

II. THE PROBLEM

From the day Adam and Eve left the Garden of Eden down to a time that is within the memory of people now living, man earned his bread by the sweat of his brow. To protect himself and gain subsistence he was driven to strenuous and almost seaseless activity. The physical struggle was a long one.

Then almost overnight something happened that disrupted this program of muscular exertion completely and for all time. Machines of new design were put on the market, and the human body, which had held a monopoly of mechanical power since time began, awoke one morning to find its occupation gone. With machinery now in operation turning out a hundred times as much power as the total man-power of the world could provide, there was little chance for muscle to regain its lost position. As a source of energy it was obsolete--sent to the junk heap along with the tallow candle and the spinning wheel. In a few years the coolie will be as extinct as the dodo.

However, a stranger in this country, after learning about the many philosophies discussed in the first part of this chapter, would immediately look about for a race of supermen. But he would certainly not find them. It was not the purpose of these philosophers to create supermen. The purpose was, among other things, to provide wholesome activity

for leisure time and to promote the health of the people.

But, alas, these sound, practical philosophies have been treated on the whole as if they were so much rubbish. The validity of this statement will be seen in the following paragraphs.

The German soldier of the last war was an infant of the World War I generation and its aftermath of confusion, poverty, and dispair. They lacked proper food, were malnourished, and suffered widespread disease. When Hitler began his actual attack on the democracies, he had at his command an army of vigorous, alert, and competent youth. Something had happened in the intervening years. When Hitler came to power, he found youthful gangs and criminals roaming the cities, degenerate forms of social vice flourishing, and every evidence of human degeneration. With characteristic German thoroughness, the Germans set to work to strengthen the biological fiber of their youth. Science was enlisted with its knowledge; competence and experience were utilized. They set up standards of personal hygiene and inculcated attitudes of self-denial, self-discipline, and cooperative effort toward a greater German.

And during this time what was happening in this country? Our physical education men warned against the alarming condition of our people. They set up aims and objectives to the end that

they would be physical equals to those with whom later they would have to fight for existence. But their warnings were unheeded, and their philosophies treated as only something nice to read and to cast aside.

Then came the supreme test--W A R!!! War--that grandiose equalizer that tests all things and all matter, animate and inanimate! And what was the effect on our country? She began to reap a rich harvest of years of soft living, deafness to those people with foresight, and defeat.

To substantiate this statement let us look at the results of the Selective Service Act of 1940. Males between twenty-one and thirty-six years of age were called. Of this call four groups were exempted:

1. College students.
2. Medical and engineering students.
3. Married men with dependents.
4. Men essential in industry.

It is obvious that these four groups include what are probably the fittest groups in the land. In short, the Act of 1940 selected from the less fit part of our population. Nevertheless, of about two million registrants examined, about 50 per cent were found to be physically unqualified for general military sevice. Of the million unfit, 900,000 were refused because of physical and mental defects, and 100,000 because of educational deficiencies.

Of this 900,000 rejections, only 32 per cent would not have been greatly helped by some phase of a good physical education program. What a significant thing to know--after it was too late! The only consolation to this whole catastrophy is that 200,000 can be completely rehabilitated.[17]

Not unlike many of the other crises of our country's turbulent history, the people arose to the trial. Those philosophies, which were so quickly discarded, were unearthed and put into action. All over the nation, everyone took up the cry--KEEP FIT! KEEP FIT! It was patriotic to keep fit so as to be able to work and fight. And so the war was won. Physical education did an immense job in the winning of this victory. The physical education men were given their just place in the sun and accredited finally with their just dues.

Here it is two years after the end of the war. What has happened to the physical education men and their philosophies? It is the writer's hunch that they have gone the way of all things--to obscurity until the time arises when they will be needed again. Also it is the writer's hunch that the primary source of the country's physical education instruction, the secondary school, is lying down on the job. Is this despicable hunch true? The answer to this problem will be

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[17] "Analysis of Reports of Physical Examination", Medical Statistics Bulletin, Number 1, Selective Service System, Washington, D. C., 1941.

found in a limited locality, namely, three of the Terre Haute, Indiana, high schools and could be considered to be generally indicative of prevailing country-wide conditions.

"Never before have we had to rely so completely on ourselves. No guardian to think for us, no precedent to follow without question, no lawmaker, only ordinary men set to deal with heartbreaking perplexity. All weakness comes to the surface. We are homeless in a jungle of machines and untamed powers that haunt and lure the imagination. Of course our culture is confused, our thinking spasmodic, and our emotion out of kilter. No mariner ever enters upon a more uncharted sea than does the average human being born in the Twentieth Century. Our ancestors thought they knew their war from birth through all eternity. We are puzzled about day after tomorrow." _____ Walter Lippman

CHAPTER II

THE TEST USED AND THE GROUPS STUDIED

I. THE TEST USED

Whereas the question to be answered in this work was whether or not the prevailing physical education programs in the Terre Haute high schools are beneficial to the participating students, a means of determining the extent of the benefits was necessary. It was the idea of the author to use a test as that means.

This test was given to selected groups representative of each school at relatively the same time. Some months later the same test was given again and the improvement, if any, tabulated. The significance of the differences in the two tests will be discussed later.

Any attempt, therefore, to set up criteria by which physical education practices are to be judged must consider the nature of man, his biologic needs, and his position in the world. Jesse F. Williams sets forth standards for judging practice:

> 1. The practice must provide physiological results, scientifically determined, indicative of wholesome functional activity of the organic systems, and sufficient for the needs of the growing organism.
> . . . . . .
> 2. The practice must have meaning and significance for the individual and provide a carry-over interest.
> . . . . . .

3. The practice must provide opportunity for the individual to satisfy those socially desirable urges and impulses of nature through engagement in motor activities appropriate to age, sex, condition, and stage of development.

4. The practice must offer opportunity to the individual under wise supervision to meet educative situations as one of a social group.[1]

. . . . . .

This is all fine material, and he who retains these principles would indeed be wise. This is only one of a myriad of methods the writer encountered in his quest for a means of arriving at a conclusion to the problem at hand. But such a method is too philosophic and subjective to be applicable to this situation. Therefore, such conditions are eliminated, and the quest is carried further.

Before the test to be used could be decided upon many considerations had to be made. Many principles are involved to support the testing idea. Among them are:

> Whatever exists at all exists in some amount. Even such abstract concepts as "goodness" and "beauty" exist in some particular degree and so existing possess items of identification. ... What exists as quantity...is easily measured becuase there are tools and techniques at hand. What exists as quality is often an expression of many factors and, although there may be tools to measure some, often the identification is difficult and the whole process lacks convictions.
>
> Anything that exists in amount can be measured. This principle does not imply that instruments or procedures are available today to measure everything that exists in amounts. Nevertheless the principle is sound and its

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[1] Jesse F. Williams, Presented in an address before the National Convention, American Physical Education Association, April, 1923.

application only awaits the perfection of instruments to this end.

All measurement is not perfect.

. . . . . .

Measurement is indispensable to growth.

. . . . . .[2]

After an exhaustive survey the author decided to use an achievement test as an agent to resolve the question at hand. The standardized achievement test has definite standards and norms, which enable the researcher to compare the achievement of the subjects with the average achievement of children of various schools, ages, and grades. By standard and norm, are meant the average achievement of any given age and grade, and various factors are discussed that influence the achievement of the pupils and should be taken into account when comparisons are made with the standards of any given achievement test.

There are many advantages in using such a test to indicate the answer to the problem. Among those who make reliable recommendations for the achievement tests are W. H. Mustaine and F. J. Moench. They enumerate many values, a few of which are:

1. It gives a basis for homogeneous grouping. ...
2. It holds the subject's interest in physical education work: discipline becomes a minor problem.
3. It gives a basis for equalization in competition which in turn produces better competition.
4. It motivates subjects to do hard work.

. . . . . .

5. It arouses an interest in their physical fitness.

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[2] Williams, The Principles of Physical Education, pp. 351-2.

. . . . . .

6. It gives the researcher increased integrity in his work.[3]

After much deliberation and elimination, the quest for an applicable achievement test narrowed down those eligible to one, namely the Cozens, Trieb, Neilson Achievement Tests. These tests are designed for both boys and girls from ten to eighteen years of age. They cover forty-five different tests for boys and twenty for girls. They may be used in any combination; one may select any ten to make a decathlon or any five for a pentathlon. The most desirable groupings are made by selecting an assortment from each of the following types of activities: running, throwing, kicking, jumping, pulling, pushing, and catching. These tests are used in conjunction with the age-height-weight classification chart and the achievement scales which have been developed by the originators of the test, all of which will be discussed presently.

On the purposes of their tests, compiled and validated by more than 56,000 records in the Los Angeles Junior and Senior High Schools, the authors enumerate:

1. To measure in definite comparable units the actual progress and improvement of the pupil in a large variety of skills.

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[3] Adapted from W. H. Mustaine, "Tests and Measurements in Physical Education," Supplement to Research Quarterly of the A.P.E.A., March, 1935, p. 11, and Francis J. Moench, "Solving Small School Problems Through Measurement," Journal of Health and Physical Education, December, 1934, pp. 28-48.

> ... The activity involved in an achievement scale program will help the boy increase his strength, skill, and indurance, and serve as an incentive for better self-direction and self-improvement.
>
> 2. To interest pupils in their play activities through a fair evaluation of their efforts and stimulate thereby an all-around physical development.
>
> . . . . . .
>
> 3. To supplement the routine physical examination. ...[4]

In selecting the representative events from the total of forty-five, the following restrictions were of necessity taken into consideration:

1. The equipment used in the events must be available in each school.

2. The selection must satisfy the time element involved so as to be thoroughly utilitarian.

3. The selection must conform with the idea of testing in at least four of the types of activities, preferably running or walking, jumping, throwing or kicking, and arm strength.

These four categories were represented in the final event selection so as to give an adequate over-all picture of each boy examined. The first selection consisted of ten events:

1. Base running.

2. Basketball throw for accuracy - 2 minutes.

3. Jump and reach.

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[4] Fredrick W. Cozens, Martin H. Trieb, and N. P. Neilson, Physical Education Achievement Scales for Boys in Secondary Schools (New York: A. S. Barnes and Co., 1936), pp. 3-4.

4. Baseball throw for accuracy.
5. Pull-up.
6. Push-up.
7. Running three steps.
8. Standing broad jump.
9. Standing whole hammon.
10. Half-mile walk.

However, it was found that this selection was unwise in respect to the criteria set down before the selection. This test was too long and consumed so much time that all schools could not be tested at relatively the same time. Also, there was too much unnecessary repetition of events which would be adequately representative of the criteria previously set forth. Therefore, the test was cut down to the first six events listed, the last four being eliminated. This revised selection convormed well with the criteria:

1. A minimum of equipment was necessary: a measuring tape, a stop watch, and some chalk.
2. The test could be given quickly.
3. All four activity groups were adequately provided for.

The procedure followed was that given by Cozens:

a. Running and Walking
Base Running
Description
The distance between bases shall be 45 feet.
The contestant starts with the front

foot on home base, facing first base. At the command "Go" he runs to first, second, third, and home, touching each base in turn.

Rules

Only one trial is allowed.

The contestant's performance is recorded as the time taken to complete the circuit from the word go until the contestant's foot touches home base.

Time shall be taken to the nearest 1/10 second and recorded in seconds and tenths.

Every base must be touched.

b. Jumping

Jump and Reach

Description.

Facing a wall, the contestant stands with toes touching the wall and with both feet, flat on the the floor. Reaching up as far as possible with his right hand and with his forearm and wrist against the wall, he makes a chalk mark on the wall. From a standing position with his side to the wall, he then jumps into the air as high as possible and makes another mark above the first one.

The chalk should not exceed one-half inch in length.

Rules

Three trials shall be allowed and the best of these recorded.

The contestant's performance is recorded to the nearest half-inch as the distance between his reach and the highest mark made on the wall.

At the jump the arms may be swung vigorously but no rocking or hopping is permitted. The contestant may dip for the jump, however.

c. Throwing, putting, and kicking.

Basketball Throw for Goal (2 Minutes)

Description

Mark out a semi-circle with chalk, radius ten feet from center of backboard projected to the floor.

The contestant holding the ball stands anywhere on the ten-foot semi-circle

On the signal "Go" he shoots for the

basket, follows in, retrieves the ball, and dribbles to a point outside the semi-circle. He then repeats the process until two minutes have elapsed.

Rules

Only one trial shall be allowed. . . .

The contestant's performance is recorded as the number of goals made in two minutes.

When shooting for the basket some part of both feet must be touching or back of the restraining line. . . .

Baseball Throw for Accuracy

Description

A throwing target should be marked on the wall as follows: Make five concentric circles one foot, two feet, three feet, four feet, and five feet in diameter. The center of all circles is three and one-half feet above the ground. . . . The circumference of the largest circle is one foot from the ground.

A throwing line is established 35 feet from the front of the target. The contestant stands with one foot in contact with the throwing line and throws the ball at the target with a free over-hand throw as used in hard ball. Each contestant has ten successive throws. Counting from the center outward, the circles score 10, 8, 6, 4, and 2. Throws hitting on the line between the two zones score for the inside zone.

Rules

The contestant's performance is recorded as the number of target points made in ten throws.

The contestant's foot must be in contact with the throwing line at the time the ball is released.

The over-hand throw must be used.

"Liners" count for the inside scoring zone.

d. Arm Strength

Pull-up

Description

The contestant hangs on a horizonal bar with arms and legs fully extended, using the upper grip (knuckles to the face). He raises

his body with his arms until his chin can be placed over the bar and lowers his body to a full swing.

Rules

Only one trial shall be allowed.

The contestant's performance shall be extension of the arms.

The body must not swing during the execution of the movement. The knees must not be raised.

No resting or change of grip is allowed.

Push-up

Description

The contestant lies on the floor, face down, body straight, arms bent, with the hands on the floor in front of the armpits. From this position he straightens his arms until he is in a front leaning rest position. He then lowers his body and straightens his arms as many times as possible. Each raising of the body counts as one push-up. The body should remain rigid and straight with the head, trunk, and legs in a line throughout the movements. Avoid "sway back" positions.

Rules

Only one trial shall be allowed.

The contestant's performance shall be recorded as the number of push-ups made to a full extension of the arms.

No resting is allowed.

The body must remain rigid. No push-ups shall be counted in which there is a "sway back" position taken.[5]

Whereas it has been previously stated that two testings were to be made, provision had to be made on the score sheet for both testings. Also provision had to be made for the improvement by event and any change in classification that might occur during the time between the testings. All

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[5] Ibid., pp. 21, 24, 27-8, 31-2, 35-6.

these points taken into consideration, a score card was finally adopted and is attached in the appendix.

In this achievement test provisions are made for individual differences in respect to age, height, and weight. According to these three criteria, each individual is classified so as to have a fair, proportionate scoring method. The scales are graduated on the theory that the boy who is older, taller, and heavier should be able to do better than the boy who is younger, shorter, and lighter. Therefore, it is possible that for the same record, a boy younger, shorter, and lighter might be awarded more scoring points than a boy older, taller, and heavier by virtue of his being in a lower scoring class. The plan for determining classification is shown in the appendix.

It may be seen by this classification plan that the three points previously discussed are fully taken into consideration. A hypothetical case will be set up so a working explanation of the use of this classification plan can be shown. Let the reader presume that a subject is fifteen years and three months old, sixty-seven inches tall, and weighs one hundred and fifty pounds. By reading down in the age column, it is found that the age of the subject falls into the category of 15:3-15:8. Tracing horizonally to the left, it is found that the exponent value is 31. Tracing down the height column, it is found that the height, sixty-

seven inches, falls in the category 66 1/2-68. By reading to the left, it is seen that the exponent value of that category is 32. Searching in the weight column, the weight in question is found to be included in the 147-153 category, the exponent value of which is 24. The sum of the exponents in all categories is 87. This total places the subject in Class "B".

This classification is necessary because each class has its own particular scoring scale. The achievement scales for the six events used in this testing are shown on the succeeding pages.

These scales are given in their full scope as set up by the authors.[6]

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[6] Ibid., pp. 62-3, 68-9, 76-7, 82-3, 90-1, 92-3.

Score	Classes						Score
	F	E	D	C	B	A	
	Time in seconds and tenths						
100	8.3	8.2	8.1	8.0			100
99					7.9	7.7	99
98	8.4	8.3	8.2	8.1			98
97					8.0	7.8	97
96	8.5	8.4	8.3	8.2			96
95					8.1	7.9	95
94	8.6	8.5	8.4	8.3			94
93					8.2	8.0	93
92	8.7	8.6	8.5	8.4			92
91					8.3	8.1	91
90	8.8	8.7	8.6	8.5			90
89					8.4	8.2	89
88	8.9	8.8	8.7	8.6			88
87						8.3	87
86	9.0	8.9	8.8	8.7	8.5		86
85						8.4	85
84	9.1	9.0	8.9	8.8	8.6		84
83						8.5	83
82	9.2		9.0		8.7		82
81		9.1		8.9			81
80	9.3		9.1		8.8	8.6	80
79		9.2		9.0			79
78	9.4		9.2		8.9	8.7	78
77		9.3		9.1			77
76					9.0	8.8	76
75	9.5	9.4	9.3	9.2			75
74					9.1	8.9	74
73	9.6	9.5	9.4	9.3			73
72					9.2	9.0	72
71	9.7	9.6	9.5	9.4			71
70					9.3	9.1	70
69	9.8	9.7	9.6	9.5			69
68					9.4	9.2	68
67	9.9	9.8	9.7	9.6			67
66					9.5	9.3	66
65	10.0	9.9	9.8	9.7			65
64					9.6	9.4	64
63	10.1	10.0	9.9	9.8			63
62						9.5	62
61	10.2	10.1	10.0	9.9	9.7		61
60						9.6	60
59	10.3	10.2	10.1	10.0	9.8		59
58						9.7	58
57	10.4		10.2		9.9		57
56		10.3		10.1			56
55	10.5		10.3		10.0	9.8	55
54		10.4		10.2			54
53	10.6		10.4		10.1	9.9	53
52		10.5		10.3			52
51					10.2	10.0	51

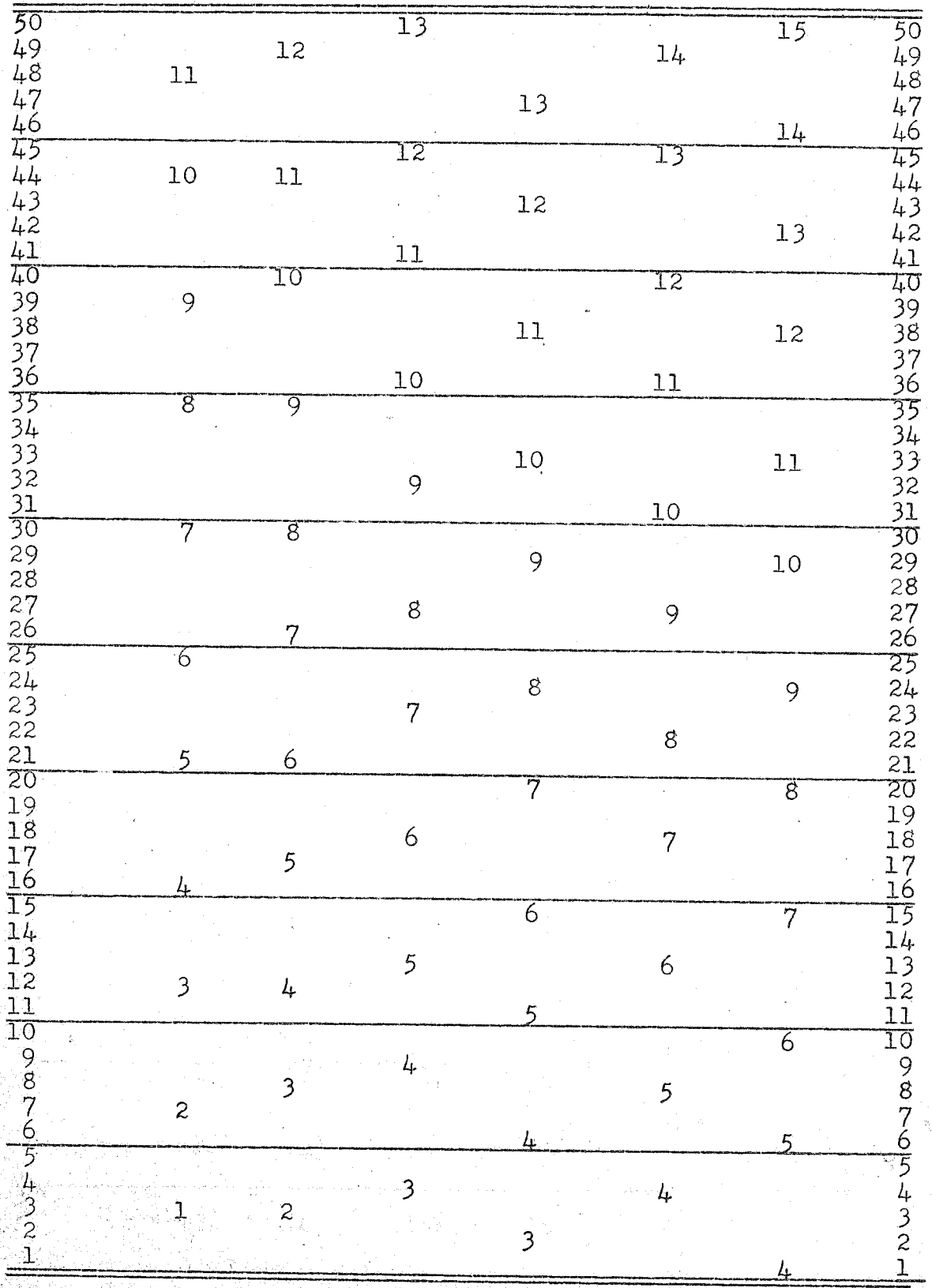
Event No. 1 Continued

50	10.7	10.6	10.5	10.4			50
49					10.3	10.1	49
48	10.8	10.7	10.6	10.5			48
47					10.4	10.2	47
46	10.9	10.8	10.7	10.6			46
45					10.5	10.3	45
44	11.0	10.9	10.8	10.7			44
43					10.6	10.4	43
42	11.1	11.0	10.9	10.8			42
41					10.7	10.5	41
40	11.2	11.1	11.0	10.9			40
39					10.8	10.6	39
38	11.3	11.2	11.1	11.0			38
37						10.7	37
36	11.4	11.3	11.2	11.1	10.9		36
35						10.8	35
34	11.5	11.4	11.3	11.2	11.0		34
33						10.9	33
32	11.6		11.4		11.1		32
31		11.5		11.3			31
30	11.7		11.5		11.2	11.0	30
29		11.6		11.4			29
28	11.8		11.6		11.3	11.1	28
27		11.7		11.5			27
26					11.4	11.2	26
25	11.9	11.8	11.7	11.6			25
24					11.5	11.3	24
23	12.0	11.9	11.8	11.7			23
22					11.6	11.4	22
21	12.1	12.0	11.9	11.8			21
20					11.7	11.5	20
19	12.2	12.1	12.0	11.9			19
18					11.8	11.6	18
17	12.3	12.2	12.1	12.0			17
16					11.9	11.7	16
15	12.4	12.3	12.2	12.1			15
14					12.0	11.8	14
13	12.5	12.4	12.3	12.2			13
12						11.9	12
11	12.6	12.5	12.4	12.3	12.1		11
10						12.0	10
9	12.7	12.6	12.5	12.4	12.2		9
8						12.1	8
7	12.8		12.6		12.3		7
6		12.7		12.5			6
5	12.9		12.7		12.4	12.2	5
4		12.8		12.6			4
3	13.0		12.8		12.5	12.3	3
2		12.9		12.7			2
1					12.6	12.4	1

Event No. 2 - Basketball Throw For Goal (2 Min).

Score	Classes F	E	D	C	B	A	Score
			Number of goals				
100		30				35	100
99	28						99
98			31	32	33		98
97		29					97
96	27		30		32		96
95				31		33	95
94		28					94
93	26		29	30	31	32	93
92							92
91		27					91
90	25		28	29	30	31	90
89							89
88		26	27		29	30	88
87	24			28			87
86		25					86
85			26	27	28	29	85
84	23						84
83		24			27	28	83
82			25	26			82
81	22						81
80		23		25	26	27	80
79			24				79
78	21				25	26	78
77		22	23	24			77
76							76
75	20				24	25	75
74		21	22	23			74
73						24	73
72	19			22	23		72
71		20	21				71
70					22	23	70
69	18	19	20	21			69
68						22	68
67					21		67
66	17	18	19	20			66
65					20	21	65
64				19			64
63	16	17	18			20	63
62					19		62
61				18			61
60	15	16	17		18	19	60
59				17			59
58			16			18	58
57	14	15			17		57
56				16			56
55			15			17	55
54	13	14			16		54
53				15		16	53
52		13	14		15		52
51	12			14			51

Event No. 2 Continued



Event No. 3 - Jump and Reach

Score	Classes F	E	D	C	B	A	Score
	Height to the nearest half-inch						
100					23½	24½	100
99	21	21½	22	22½			99
98							98
97					23	24	97
96	20½	21	21½	22			96
95							95
94					22½	23½	94
93	20	20½	21	21½			93
92							92
91					22	23	91
90	19½	20	20½	21			90
89							89
88					21½	22½	88
87	19	19½	20	20½			87
86							86
85					21	22	85
84	18½	19	19½	20			84
83							83
82					20½	21½	82
81	18	18½	19	19½			81
80							80
79					20	21	79
78	17½	18	18½	19			78
77							77
76					19½	20½	76
75	17	17½	18	18½			75
74							74
73					19	20	73
72	16½	17	17½	18			72
71							71
70					18½	19½	70
69	16	16½	17	17½			69
68							68
67					18	19	67
66	15½	16	16½	17			66
65							65
64					17½	18½	64
63	15	15½	16	16½			63
62							62
61					17	18	61
60	14½	15	15½	16			60
59							59
58					16½	17½	58
57	14	14½	15	15½			57
56							56
55					16	17	55
54	13½	14	14½	15			54
53							53
52					15½	16½	52
51	13	13½	14	14½			51

Event No. 3 Continued

50							50
49					15	16	49
48	12½	13	13½	14			48
47							47
46					14½	15½	46
45	12	12½	13	13½			45
44							44
43					14	15	43
42	11½	12	12½	13			42
41							41
40					13½	14½	40
39	11	11½	12	12½			39
38							38
37					13	14	37
36	10½	11	11½	12			36
35							35
34					12½	13½	34
33	10	10½	11	11½			33
32							32
31					12	13	31
30	9½	10	10½	11			30
29							29
28					11½	12½	28
27	9	9½	10	10½			27
26							26
25					11	12	25
24	8½	9	9½	10			24
23							23
22					10½	11½	22
21	8	8½	9	9½			21
20							20
19					10	11	19
18	7½	8	8½	9			18
17							17
16					9½	10½	16
15	7	7½	8	8½			15
14							14
13					9	10	13
12	6½	7	7½	8			12
11							11
10					8½	9½	10
9	6	6½	7	7½			9
8							8
7					8	9	7
6	5½	6	6½	7			6
5							5
4					7½	8½	4
3	5	5½	6	6½			3
2							2
1							1

Score	Classes F	E	D	C	B	A	Score
	Point value made on target						
100	94		98			100	100
99		96					99
98				98			98
97					98		97
96	92		96			98	96
95		94					95
94				96			94
93	90		94		96		93
92		92				96	92
91							91
90	88			94			90
89			92		94		89
88		90					88
87	86					94	87
86				92			86
85		88	90		92		85
84	84						84
83						92	83
82				90			82
81		86	88				81
80	82				90		80
79							79
78		84	86	88		90	78
77	80						77
76					88		76
75							75
74	78	82	84	86		88	74
73							73
72					86		72
71	76	80					71
70			82	84			70
69						86	69
68	74						68
67		78	80		84		67
66				82			66
65						84	65
64	72	76					64
63			78		82		63
62				80			62
61	70	74					61
60						82	60
59			76		80		59
58	68			78			58
57		72					57
56			74			80	56
55	66				78		55
54		70		76			54
53							53
52						78	52
51	64						51

Event No. 4 - Continued

50		68		74	76		50
49	62		70				49
48		66		72		76	48
47					74		47
46	60		68				46
45		64		70	72	74	45
44	58						44
43			66				43
42		62		68	70	72	42
41	56		64				41
40		60				70	40
39				66	68		39
38	54		62				38
37		58		64		68	37
36	52				66		36
35		56	60				35
34				62		66	34
33	50		58		64		33
32		54					32
31	48			60	62	64	31
30			56				30
29		52		58			29
28	46				60	62	28
27		50	54				27
26	44			56			26
25			52		58	60	25
24		48					24
23	42			54		58	23
22		46	50		56		22
21	40			52			21
20					54	56	20
19		44	48				19
18	38			50			18
17			46		52	54	17
16		42					16
15	36			48			15
14		40	44		50	52	14
13	34						13
12				46			12
11		38	42		48	50	11
10	32			44			10
9		36	40				9
8	30				46	48	8
7				42			7
6		34	38		44	46	6
5	28						5
4			36	40			4
3	26	32			42	44	3
2				38			2
1		30	34				1

Event No. 5 - Pull-up

Score	Class F	E	D	C	B	A	Score
	Number of pull-ups						
100			20	22		25	100
99	17				23		99
98							98
97		18		21		24	97
96			19				96
95	16				22		95
94				20		23	94
93		17	18				93
92					21		92
91	15					22	91
90		16		19			90
89			17		20		89
88						21	88
87	14			18			87
86		15	16				86
85					19		85
84	13					20	84
83				17			83
82		14	15		18		82
81						19	81
80	12			16			80
79					17		79
78		13	14			18	78
77							77
76	11			15			76
75		12	13		16	17	75
74							74
73	10			14			73
72					15		72
71		11	12			16	71
70							70
69	9			13	14		69
68			11			15	68
67		10					67
66				12			66
65	8				13	14	65
64		9	10				64
63							63
62				11	12	13	62
61	7						61
60		8	9				60
59				10		12	59
58	6				11		58
57			8				57
56		7					56
55				9	10	11	55
54	5						54
53		6	7				53
52				8	9	10	52
51							51

Event No. 5 - Continued

50		4						50
49								49
48			5					48
47				6			9	47
46					7	8		46
45								45
44								44
43		3						43
42								42
41			4					41
40				5			8	40
39					6	7		39
38								38
37								37
36		2						36
35								35
34			3				7	34
33				4	5	6		33
32								32
31								31
30		1						30
29								29
28			2					28
27				3			6	27
26					4	5		26
25								25
24								24
23								23
22								22
21			1					21
20				2			5	20
19					3	4		19
18								18
17								17
16								16
15								15
14							4	14
13				1	2	3		13
12								12
11								11
10								10
9								9
8								8
7							3	7
6					1	2		6
5								5
4								4
3								3
2								2
1								1

Event No. 6 - Push-up

Score	Classes F	E	D	C	B	A	Score
	Number of push-ups						
100	44		45		48	50	100
99		44		46	47	49	99
98	43		44	45			98
97	42	43			46	48	97
96		42	43	44			96
95	41		42		45	47	95
94		41		43	44	46	94
93	40		41	42			93
92	39	40			43	45	92
91		39	40	41			91
90	38		39		42	44	90
89		38		40	41	43	89
88	37		38	39			88
87	36	37			40	42	87
86		36	37	38			86
85	35		36		39	41	85
84		35		37	38	40	84
83	34		35	36			83
82	33	34			37	39	82
81		33	34	35			81
80	32		33		36	38	80
79		32		34	35	37	79
78	31		32	33			78
77	30	31			34	36	77
76		30	31	32			76
75	29		30		33	35	75
74		29		31	32	34	74
73	28		29	30			73
72	27	28			31	33	72
71		27	28	29			71
70	26		27		30	32	70
69		26		28	29	31	69
68	25		26	27			68
67	24	25			28	30	67
66		24	25	26			66
65	23		24		27	29	65
64		23		25	26	28	64
63	22		23	24			63
62	21	22			25	27	62
61		21	22	23			61
60	20		21		24	26	60
59		20		22	23	25	59
58	19		20	21			58
57	18	19			22	24	57
56		18	19	20			56
55	17		18		21	23	55
54		17		19	20	22	54
53	16		17	18			53
52	15	16			19	21	52
51		15	16	17			51

Event No. 6 - Continued

50	14				18	20	50
49			15				49
48		14		16			48
47					17	19	47
46	13						46
45			14				45
44		13		15			44
43					16	18	43
42	12						42
41			13	14			41
40		12				17	40
39	11				15		39
38			12				38
37		11		13			37
36					14	16	36
35	10						35
34			11	12			34
33		10					33
32	9				13	15	32
31			10				31
30				11			30
29		9				14	29
28	8				12		28
27			9				27
26		8		10			26
25					11	13	25
24	7						24
23			8	9			23
22		7					22
21	6				10	12	21
20			7				20
19		6		8			19
18						11	18
17	5				9		17
16			6				16
15		5		7			15
14					8	10	14
13	4						13
12			5	6			12
11		4				9	11
10	3				7		10
9			4				9
8		3		5			8
7					6	8	7
6	2						6
5			3				5
4		2		4			4
3					5	7	3
2	1						2
1			2	3			1

Knowing the boy's class, the reader can locate the performance record in the class column. The score to be given for the performance will be found directly opposite either to the left or to the right.

Example: Class "C" boy; standing broad jump; record, seven feet, four and one-half inches. This record will be found in the column for Class "C". The score, 66, is found opposite the record in the score column.

If the exact performance record can not be found in the achievement scale, the reader should find the record nearest to it and use the score opposite the record. When the performance record falls exactly midway between two records appearing in the achievement scale, the record giving the lowest score should be used.

It is hoped that after this lengthy explanation, there will be no confusion as to the mechanics of the test. Also, it is hoped that familiarity with this test will disclose many of the merits that may have otherwise been neglected by the author. With the work of selecting the testing instrument complete, it is now necessary to review the principal participants of this work.

II. THE GROUPS STUDIED

The fortunes of youth are inseparably bound up with the fortunes of society. The forces operating for the past generation have produced an unfavorable, unstable, and confused society and have thrown the world into a tragic conflict which youth have been called upon to resolve into a peaceful state. Thus it has always been. Youth have been repeatedly called upon to save a nation, when the peaceful negotiations of their elders have broken down, but they have never had an equally prominent part in making the plans to build the conditions which will sustain the victory they have won.

During the war the youth of the land were riding high. The people worked endlessly to supply them with the equipment they needed to crush the enemy. The people did not question funds for their health or their leisure. They were well clad, nutritiously fed, cleanly housed, and guided by spiritual advisers. The people sacrificed and denied themselves that they might have everything possible. To do otherwise would have been unworthy of them.

Not the least of the benefits projected to our youth during those trying days was the physical education program. It had radically changed from that of its forerunner of pre-war days. It offered and imposed upon the youth

opportunities to prepare themselves physically for the supreme tasks that lay before them. The programs were geared to do the unusual in unusual times. During those days it was as patriotic to keep fit as it was to fight or do war work. But now what is the situation? In spite of all the emphasis placed on the atomic era, the fact remains that the world is in an age where its first line of defense is its youth. When the youth falters and falls by the wayside, then there is little hope for mankind. Physical education must accept its part of the responsibility to prepare and preserve the youth of today for a better and happier world tomorrow.

Now let us look at the leading characters that play the principal roles in this drama. In so far as the field to be covered by this work is so vast as to approach infinity, it is necessary for the sake of convenience to confine the field to be tested. Terre Haute, Indiana, was chosen as this confined field. And this confined field was further narrowed to include only three of the four high schools in that city, those chosen being Wiley, Garfield, and the Laboratory School of Indiana State Teachers College.

First the instructors of physical education will be considered. The reader must realize the vast, unending responsibilities of these servants of our youth. Their position is deserving of much attention in this work as it

is actually as much a test of their proceedings as it is the program that they administer. There are certain ideas that the physical education instructors must realize as existing, and they must realize further that vague but important generalities are present which they must take into consideration as they mold and prepare their charges.

These teachers must take cognizance of the changes that have taken place and are now taking place in American society. They must seek to help persons adjust successfully to the social group to which they belong. In order to do this, the teachers must plan and adjust their programs to meet the needs of individuals who are living in present-day society. They must not turn their backs to the sun and conclude that its main function is to cast shadows.[7] They must realize that the light that flows from a knowledge of social conditions supplies one of the best guides to conscientious educational effort. They must have a faith in physical education if they are to bring about desirable changes in their pupils and help them enjoy and share more of the true pleasures of life.

The social trends which are observable in American society indicate that there is an increasing need for physical education in all the schools of the country. The home,

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[7] Kahlil, Gibran, The Prophet (New York: Alfred A. Knopf, 1923), p. 52.

which is the fundemental integrating unit of society, takes care of relatively fewer interests and needs than it did for previous generations. In many families all the members now get most of their education, recreation, and social contacts outside the home. Practically all the activities directed toward earning a living are carried on away from home. In fact, most of the wants and desires of American people are being satisfied to an increasing degree in situations removed from home. Available data on the vitality of the American people indicate that the opportunity is open for physical education to make a big and valuable contribution to the efficiency and the ability of the present and succeeding generations to enjoy life. It is apparent, in view of the change in the character and the functions of the home, the mechanization of industry, the increasing amount of leisure, and the prominent unsolved problems of race vitality, that there is a real need for understanding, progressive physical education instructors in all the schools of the nation.[8]

With this information in mind the author will proceed to the groups to be tested. Officials of the chosen schools were approached, and permission was received for proceeding with the testings. The basic idea of the work to be under-

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[8] Jackson R. Sharman, Introduction to Physical Education (New York: A. S. Barnes and Company, 1934), pp. 1-15.

taken was discussed with various physical education men in each school, and the necessary preliminary organization was accomplished. A representative of each school was asked to prepare a short article on the philosophy or the working plans of the physical education program in his school.

Mr. George Ashworth, a member of the Physical education department, Wiley High School, places emphasis on philosophy and says:

> Physical education, it seems to me, should be an integral part of the general educational program, having as its goals the preparation of the child to live in the world as it is and his preparation for a part in shaping a better world.
>
> To attain these goals the child should learn by doing, so that behavior patterns will be modified by knowledge. Social and moral results should be stressed in game situations and emphasis should be placed on enjoyment and development of a reasonable degree of skill.

Mr. Paul L. Wolf, representing the Laboratory School of Indiana State Teachers College, outlines the program of his school and what the program tries to accomplish:

> In the physical education program at the Laboratory School we try to develop the all-round musculature and stamina and endurance of our pupils. We endeavor to teach them sports and recreation activities they will appreciate and enjoy and participate in at their leisure.
>
> The first part of each day's work is devoted to the physical fitness category. Calisthenics, apparatus (of the climbing and hanging variety), combative contests, tumbling and stunts, and relays and simple games are employed to develop particularly the upper extremity muscles. We strive to put as much competition and fun into these activities as we can since boys in general do not take to these types of exercises. . . as readily as they do the sports and recreation groups.
>
> The sports and recreation part of the program comes into play the last part of each lesson. An attempt is made to teach the various sports in season whenever time

> and facilities permit. Fundamentals, strategy, rules and etiquette of play are a part of every unit. We feel the better pupils can execute the skills involved and the more they know about a sport the more they will seek participation.

The Garfield High School representative, Mr. Willard Kehrt, gave similar points as a basis for the physical education program at that school.

With these attitudes in mind the author turned to the selection of the subjects to be tested. After considering many possibilities, he decided to pick a limited number of boys, not to exceed fifty, to represent each school. These groups were picked at random, considering no distribution as to class, age, scholarship, or other criteria, so that any possibility of discrimination, even to the most infintesimal degree, would be eliminated. No "packing of the jury" or any other practice, shady in any degree whatsoever, can be claimed against the author. The only stipulation that was made in the selection of the representatives of the schools was that they be boys who had never participated in any interscholastic sports in any type of practice. This criterion was instituted so that those tested would be recipients of the benefits of their respective physical education programs only and not have any outside, specialized instruction that would cause radical fluctuations in the findings of this work. By using this criterion, it would then be possible to attribute any progress of these boys directly to the prevailing physical education programs.

It may be said with all truthfulness and sincerity that the boys on a whole were very cooperative and were a credit to their physical education instructors and their schools; of course there were those who were stricken with that adolescent malady, negativism. That is to be expected in any group of adolescents and is a factor that will be dismissed as being so insignificant as to be immaterial.

With the purpose of this chapter being completely fulfilled, it is now necessary to turn to the next chapter to observe the procedure technique.

"Now, when all human institutions so slowly and laboriously evolved are impugned, every concensus challanged, every creed flouted, as much as and even perhaps more than by the ancient Sophists, the call comes to us . . . to explore, test, and, if necessary, reconstruct the very bases of conviction, for all open questions are new opportunities. Old beacon lights have shifted or gone out. Some of the issues we lately thought to be minor have taken on cosmic dimentions. We are all 'up against' questions too big for us. . . . Hence, there is . . . a realization that mankind must now reorient itself and take its bearings from the eternal stars and sail no longer into the unknown future by dead reckonings of the past." ___ G. Stanley Hall

CHAPTER III

PROCEDURE

With the problem to be solved and the agent for its accomplishment decided upon, the author now turns to the procedure.

It was first necessary to secure permission from the proper authorities in each of the three schools to carry on the experiment. At this time the author deems it pertinent to give credit to those persons, administrators and instructors, whose splendid cooperation and assistance aided greatly in the completion of this work. They are indeed credits to their professions. With the go-ahead sign received, the author first had to select the groups to be the objects of the experiment.

The number of students who would represent each school was arrived at by using the Laboratory School as a primary measure. The Laboratory School was used because of the following restriction. The basic idea was to employ relatively the same number of students in each of the schools to be tested; therefore the Laboratory School would be the confining element, as that school had the smallest enrollment. After the survey at the Laboratory School was completed, it was found that there were thirty-seven students elegible to represent their school, according to the criteria

of select set-up in the preceding chapter. This number was kept constantly in mind while the other two schools were being surveyed. At Wiley the number selected was forty-eight, slightly larger because of the possibility of losing some subjects during the time elapsing between the two testings. At Garfield forty students met requirements to represent their school.

The task of selecting representative groups completed, the next task was to apply the test--already agreed upon. The students were told only that there was to be a test given and that they were in competition with other students from the different city schools. The author thinks this is the opportune moment to state that he realizes there were some discrepancies in the administration of this test. An assumption was made--one that is not completely valid but nevertheless necessary under the prevailing circumstances. The author assumed that all the testees were in good, sound, physical condition, that their minds were completely on the work at hand, and that there were no disturbing influences of any sort that might cause deviations in the test results. However, as this assumption held good for all students in each school, it was considered an aid in every case. The aforesaid assumption was necessary for the reason that there were no means of allowing for any of the factors mentioned, had they been present in detrimental proportions. The

author was, however, cognizant of the fact that such possibilities are ever present and are liable for fluctuations in results. The test, constructed and selected by the means set forth in Chapter II, was administered to the chosen groups. The following procedure was used, one explanation being considered as sufficient and indicative of the procedure used in all the schools.

The headings were filled in by the students themselves, and in cases where there was doubt as to height and weight, the doubt was expelled by measurement. Then, in keeping with the procedure of the test, exponent values were given for height, weight, and age. The sum of the exponents was computed and each student classified thereby.

The classification procedure accomplished, the events of the test were administered. In this procedure the rules set down by the originators were strictly adhered to in even the slightest detail. This strict adherence to rules was followed throughout each school so far as was humanly possible. This was done in an endeavor to eliminate as completely as possible any foreign discrepancies that might cause unsatisfactory results and give one group an advantage over another. The author is aware that some irregularities probably occurred but not within his knowledge. The testing was carried on in as fair, equal, and unbiased a manner as human inefficiency would allow.

The records of each event for each student tabulated, the value of the record in scoring points was computed according to the tables accompanying the test. The points earned in each event were totaled, giving the total score for each student.

The first testing was given during the last part of November and the first part of December. The school testings were made as closely together as time would warrant so as not to give any group a distinct advantage over another in respect to training received during the time elapsing between the two testings. Of course the test could not be given to all the groups at the same time, but the few days' instruction one group may have had over another will be considered as insignificant and will be disregarded in this work after this brief mention.

The first test having been finished, it was necessary to wait as long as possible before the second testing was made in order for the physical-education program to have its effects on the testees. The second testing was made during the last of April and the first of May and was given by schools in the order of the first testing. This was done in an effort to compensate further for any advantage one group might have had over another in the total days of instruction between the two testings. The same precise procedure was used in the second testing as in the first.

With the results of both testings compiled, various devices were used to sift every possible bit of information, regardless of the effect on the supposed outcome. The findings will be elaborated upon in Chapter IV.

The significance of the findings of the experiment enabled the drawing of conclusions and the formulation of a summary. These data will be exhaustively reported in Chapter V.

"Sport, which keeps the flag of idealism flying, is perhaps the most saving grace in the world at the moment with its spirit of rules kept, and regard for the adversary whether the fight is goings for or against; when, if ever, the fair play spirit of sport reigns over international affairs, the cat force which rules there now will slink away and human life emerge for the first time from the jungle." --- John Galsworthy.

CHAPTER IV

RESULTS OF THE TESTS AND COMPARISONS

This chapter concerns the test results and comparisons of those results. Each testing will be considered separately, as will the improvements. They will be collectively considered in Chapter V.

The first testing alone proves nothing in respect to the central, prime purpose of this theses. It does, however, form a basis upon which the answer to the problem can be based. While the first testing alone has little primary value, it is significant within itself in that it gives a general picture of the physical capabilities of the representative groups.

The first testing plus the second testing is the most significant for it is the differences between these two testings that solve the problem involved.

In every effort to give just consideration to all concerned and show the accomplishments of each group, the author will show by various means the outcomes of each testing and the differences thereof. They are as follows:

I. It was first necessary to see what score each school made. This score shows the percentage of total possible points made by each school for each testing and

the improvement. For example, on the first testing at the Laboratory School a total score of 8,264 points was made of a possible 22,200. This gives the school a percentage score of 37.22 per cent. The findings in the other schools plus the improvements are shown on the following table.

TABLE I

TOTAL POINT PERCENTAGE SCORES

School	First Testing	Second Testing	Improvement
State	37.22	48.88	11.66
Wiley	20.58	40.03	10.45
Garfield	31.40	37.85	6.45

II. The boys in each school fell into one of six classes, according to the procedure explained in Chapter II. The change in the figures between the two testings is attributed to growth in height, weight, or age, or combinations of the three, the classification exponent total placing the boys usually in the next higher class and in a few cases the second next highest class. The findings are shown on the following table and could be generally indicative of growth at the different age levels.

TABLE II

CLASS NUMBER PERCENTAGES

School	Class	First Testing	Second Testing
Wiley	A	21-34.75	23-63.80
	B	15-31.25	10-27.77
	C	8-16.66	1-02.77
	D	2-04.16	1-02.77
	E	1-02.08	1-02.77
	F	1-02.08	0-00.00
State	A	14-37.83	19-57.57
	B	13-35.13	11-33.33
	C	7-18.91	2-06.06
	D	2-05.40	1-03.03
	E	1-02.70	0-00.00
	F	0-00.00	0-00.00
Garfield	A	16-40.00	18-46.15
	B	11-27.50	12-30.76
	C	8-20.00	7-17.94
	D	3-07.50	2-05.12
	E	2-05.00	0-00.00
	F	0-00.00	0-00.00

III. Each group had its own possible perfect score, and some of the results were computed by that measure. It was possible that each, if he made a perfect score, could make 600 points, there being six events, the perfect score of each being 100 points. By this premise the perfect score of Wiley could be 28,800, of State 22,200, of Garfield 24,000 by virtue of the number in the respective groups. These scores include all possible points of all events. In the second testing these scores changed, for the number of boys tested changed.

With these scores in mind the author computed the percentage of the total possible score made by each event. For example, at Wiley the base running event score was 1,496. As the total possible score for all events was 28,800, then the base running event scored 5.19 per cent of the total score of all events. A perfect score throughout the base running event would have compiled 16.66 per cent of the total possible score of all events. The percentages of the other events in each school are shown on Page 59. Also shown on the table are the results of the second testing and the improvement, if any.

TABLE III

TOTAL POSSIBLE POINT PERCENTILES

School	Event	First Testing	Second Testing	Improvement
Wiley	1	1497-05.19	1492-06.90	1.71
	2	849-02.94	881-04.07	1.13
	3	2844-09.87	2560-11.85	1.98
	4	787-02.73	710-03.28	0.55
	5	1049-03.64	1235-05.71	2.07
	6	1966-06.82	1839-08.51	2.32
		48 boys tested	36 boys tested	
State	1	2198-09.90	2744-13.85	3.95
	2	917-04.13	1182-05.96	1.83
	3	1376-06.19	2052-10.36	4.17
	4	637-02.86	456-02.30	-0.56
	5	1372-16.18	1322-06.66	0.49
	6	1669-07.51	1843-09.30	1.79
		37 boys tested	33 boys tested	
Garfield	1	999-04.16	1673-07.14	2.98
	2	505-02.10	894-03.82	1.72
	3	2112-08.80	2076-08.87	0.07
	4	848-03.53	865-03.69	0.16
	5	915-03.81	1221-05.21	1.30
	6	2243-09.34	2266-09.68	0.34
		40 boys tested	39 boys tested	

The following comparisons are those of the foregoing tables. Reading down in the Wiley push-up event column and across in the Garfield push-up event column, the reader will find the number, 2.52 per cent, and the letter "G" which denotes that Garfield excelled Wiley in the push-up event by a margin of 2.52 per cent.

TABLE IV

FIRST TESTING TOTAL POSSIBLE POINT PERCENTILE COMPARISONS

		WILEY						STATE						GARFIELD					
Event		6	5	4	3	2	1	6	5	4	3	2	1	6	5	4	3	2	1
	1	1.63 (6)	1.55 (1)	2.46 (1)	4.68 (3)	2.25 (1)													
WILEY	2	3.88 (6)	0.70 (5)	0.21 (2)	6.93 (3)														
	3	3.05 (3)	6.23 (3)	7.14 (3)															
	4	4.09 (6)	0.91 (5)																
	5	3.18 (6)																	
	6																		
	1						4.17 (S)	2.39 (1)	3.72 (1)	7.04 (1)	3.71 (1)	5.77 (1)							5.74 (S)
	2					1.19 (S)		3.38 (6)	2.05 (5)	1.27 (2)	2.06 (3)							2.03 (S)	
STATE	3				3.68 (W)			1.32 (6)	0.01 (3)	4.33 (3)							2.61 (G)		
	4			0.13 (S)				4.65 (6)	4.32 (5)							0.67 (G)			
	5		2.54 (s)					1.33 (6)							2.37 (S)				
	6	0.69 (S)												1.83 (G)					
	1						1.03 (W)							5.18 (6)	0.35 (1)	0.63 (1)	4.64 (3)	2.06 (1)	
GARFIELD	2					0.84 (W)								7.24 (6)	1.71 (5)	1.03 (4)	6.70 (3)		
	3				1.07 (W)									0.54 (6)	4.99 (3)	5.27 (3)			
	4			0.80 (G)										5.81 (6)	0.28 (5)				
	5		0.17 (G)											5.53 (6)					
		2.52 (G)																	

TABLE V

SECOND TESTING TOTAL POSSIBLE POINT PERCENTILE COMPARISONS

	Event	WILEY 6	5	4	3	2	1	STATE 6	5	4	3	2	1	GARFIELD 6	5	4	3	2	1
WILEY	1	1.61 (6)	1.73 (1)	3.62 (1)	4.95 (3)	2.73 (1)													
	2	4.44 (6)	1.64 (5)	0.79 (2)	7.78 (3)														
	3	3.34 (3)	6.14 (3)	7.67 (3)															
	4	5.23 (6)	2.43 (5)																
	5	2.80 (6)																	
	6																		
STATE	1						6.95 (S)	4.55 (1)	7.18 (1)	11.55 (1)	3.49 (1)	7.89 (1)							6.71 (S)
	2					1.89 (S)		3.34 (6)	0.71 (5)	3.66 (2)	4.40 (3)							2.14 (S)	
	3				1.49 (W)			1.06 (3)	3.69 (3)	8.06 (3)							1.49 (S)		
	4			0.98 (W)				7.00 (6)	4.37 (5)							1.39 (G)			
	5		0.96 (S)					2.73 (6)							1.46 (S)				
	6	0.79 (S)												0.38 (G)					
GARFIELD	1													2.54 (6)	1.93 (1)	3.45 (1)	1.73 (3)	3.32 (1)	
	2													5.86 (6)	1.39 (5)	0.13 (2)	5.05 (3)		
	3													0.81 (6)	3.66 (3)	5.18 (3)			
	4													5.99 (6)	1.52 (5)				
	5													4.47 (6)					
	6																		

On Page 64 will be found a table comparing the improvements of the total possible point percentiles. For example, in the push-up event State improved 0.44 per cent more than Wiley did in the same event.

TABLE VI

TOTAL POSSIBLE POINT PERCENTILE IMPROVEMENT COMPARISONS

		WILEY						GARFIELD					
	Event	6	5	4	3	2	1	6	5	4	3	2	1
WILEY	1												
	2												
	3												
	4												
	5												
	6												
STATE	1						(S) 2.24						(S) 0.97
	2					0.70 (S)						0.11 (S)	
	3				2.19 (S)						0.63 (G)		
	4			1.11 (W)						0.33 (S)			
	5		1.58 (W)						0.91 (G)				
	6	0.44 (S)						1.45 (S)					
GARFIELD	1						1.27 (G)						
	2					0.59 (G)							
	3				1.91 (W)								
	4			0.39 (W)									
	5		0.77 (W)										
	6	1.89 (W)											

IV. The next consideration will be given to class point percentiles. Using the same total points scored in each event, calculations were made to show the percentages of points scored in each event by each school. For example, at Wiley 1,497 points were scored in the base running event. Whereas it was possible for Wiley to have scored 4,800 points for a 100 per cent score, actually 31.18 per cent was scored by virtue of the 1,497 points accomplished. In the second testing Wiley made a total of 1,492 points of a possible 3,600, earning a percentile of 41.44 per cent. This shows an improvement of 10.26 per cent. The first and second testing scores plus the improvement are shown on the following table. Because the mean score is the same number in each case as the number given for the above, it will not be included.

TABLE VII

POSSIBLE POINT PERCENTILES

School	Event	First Testing	Second Testing	Improvement
Wiley	1	1497-31.18	1492-41.44	10.26
	2	849-17.68	881-24.47	6.79
	3	2844-59.25	2560-71.11	11.86
	4	787-16.39	710-19.72	3.33
	5	1049-21.85	1235-34.30	12.45
	6	1966-40.95	1839-51.08	10.13
		48 boys tested	36 boys tested	
State	1	2198-59.40	2744-83.15	23.75
	2	917-24.78	1182-35.81	11.03
	3	1376-57.18	2052-62.18	5.00
	4	637-17.21	456-13.81	-03.40
	5	1372-37.08	1322-40.06	2.98
	6	1669-45.10	1843-55.84	10.74
		37 boys tested	33 boys tested	
Garfield	1	999-24.97	1673-42.89	17.92
	2	505-12.63	894-22.92	10.29
	3	2112-52.80	2076-53.23	.43
	4	848-21.20	865-22.17	.97
	5	915-22.87	1221-31.30	8.43
	6	2243-56.04	2266-58.10	2.06
		40 boys tested	39 boys tested	

The comparison of the scores on the foregoing tables has been computed. Each testing has been considered, as has the improvement. The table is read as follows: In the comparison of the push-up event scores of Wiley and Garfield, Garfield excelled Wiley by a margin of 15.09 per cent. Thus in the appropriate square there are the number, 15.09, and the letter "G" to denote the superior school.

TABLE VIII

FIRST TESTING
POSSIBLE POINT PERCENTILE COMPARISONS

Event		WILEY 6	5	4	3	2	1	GARFIELD 6	5	4	3	2	1
WILEY	1												
	2												
	3												
	4												
	5												
	6												
STATE	1						28.2 (S)						34.4 (S)
	2					7.10 (S)						12.2 (S)	
	3				22.1 (W)						15.6 (G)		
	4			0.82 (S)						3.99 (G)			
	5		15.2 (S)						14.2 (S)				
	6	4.15 (S)						10.9 (G)					
GARFIELD	1						6.21 (W)						
	2					5.05 (W)							
	3				6.45 (W)								
	4			4.81 (G)									
	5		1.02 (G)										
	6	15.1 (G)											

TABLE IX

SECOND TESTING
POSSIBLE POINT PERCENTILE COMPARISONS

	Event	WILEY 6	WILEY 5	WILEY 4	WILEY 3	WILEY 2	WILEY 1	GARFIELD 6	GARFIELD 5	GARFIELD 4	GARFIELD 3	GARFIELD 2	GARFIELD 1
WILEY	1												
	2												
	3												
	4												
	5												
	6												
STATE	1						41.7 (S)						40.3 (S)
	2					11.3 (S)						1.55 (S)	
	3				8.93 (S)						18.9 (S)		
	4			5.91 (W)						8.36 (G)			
	5		5.76 (W)						8.76 (S)				
	6	4.76 (S)						2.26 (G)					
GARFIELD	1						1.45 (W)						
	2					1.55 (W)							
	3				17.9 (W)								
	4			2.45 (G)									
	5		3.00 (W)										
	6	7.02 (G)											

On the next page will be found comparisons of the improvements in the possible point percentile. As an illustration, State improved 12.49 per cent more than Wiley did in the base running event.

TABLE X

POSSIBLE POINT PERCENTILE IMPROVEMENT COMPARISONS

Event		WILEY						GARFIELD					
		6	5	4	3	2	1	6	5	4	3	2	1
WILEY	1												
	2												
	3												
	4												
	5												
	6												
STATE	1						12.5 (S)						5.83 (S)
	2					4.24 (S)						0.74 (S)	
	3				6.86 (W)						4.57 (S)		
	4			0.07 (S)						2.43 (S)			
	5		9.47 (W)						5.45 (G)				
	6	0.61 (S)						7.69 (S)					
GARFIELD	1						7.66 (G)						
	2					3.50 (G)							
	3				11.4 (W)								
	4			2.36 (W)									
	5		4.02 (W)										
	6	8.07 (W)											

V. The distribution of the boys in grade will be discussed. Whereas the reader might think that the grade including the greatest number of boys would most likely make the highest score, that has not been the case. At the Laboratory School in the base-running event the sophomores made the highest score with a 62.35 per cent, while not having the largest number of boys of that school incorporated in its ranks. Of course the senior class of that school made a score of 64 per cent, but there was only one boy at that grade level.

The distribution of the boys by number in each grade, the points and percentiles scored in each testing are shown in the following table. Because the mean is the same number as the percentile, a mean table will not be included.

TABLE XI

POSSIBLE GRADE POINT PERCENTILES
FIRST TESTING

School	Event	Senior	Junior	Soph.	Frosh.
Wiley	1	200-40.00	581-36.31	NONE	726-26.88
	2	104-20.80	370-23.12		375-13.88
	3	344-68.88	984-61.50		1391-51.32
	4	95-19.00	371-23.18		321-11.88
	5	174-34.80	414-25.87		461-17.07
	6	303-60.60	769-48.06		894-33.11
		5 boys tested	16 boys tested		27 boys tested
State	1	64-64.00	99-49.50	873-62.35	1162-58.10
	2	20-20.00	30-15.00	302-21.57	551-27.55
	3	70-70.00	71-35.50	470-33.57	853-42.65
	4	65-65.00	25-12.50	277-19.78	280-14.00
	5	55-55.00	0-00.00	519-37.07	798-39.90
	6	52-52.00	39-19.50	706-50.42	872-43.60
		1 boy tested	2 boys tested	14 boys tested	20 boys tested
Garfield	1	68-22.66	441-29.57	264-24.00	302-25.16
	2	38-12.66	171-12.21	101-09.18	194-16.16
	3	213-71.00	786-56.14	150-13.63	666-55.50
	4	34-11.33	359-25.64	79-07.18	358-29.83
	5	65-21.66	369-26.35	181-16.45	371-30.91
	6	162-54.00	719-51.35	462-42.00	686-57.16
		3 boys tested	14 boys tested	11 boys tested	12 boys tested

TABLE XII

POSSIBLE GRADE POINT PERCENTILES
SECOND TESTING

School	Event	Senior	Junior	Soph.	Frosh.
Wiley	1	273-45.50	592-42.28	637-39.81	274-39.14
	2	159-26.50	336-24.00	415-25.93	190-27.14
	3	450-75.00	1097-78.35	955-59.68	323-46.14
	4	300-50.00	344-24.57	256-16.00	207-29.57
	5	231-38.50	626-44.71	378-23.62	274-39.14
	6	335-55.83	863-61.64	641-40.06	442-63.14
		6 boys tested	14 boys tested	16 boys tested	7 boys tested
State	1	NONE	345-86.25	1593-83.84	886-88.60
	2		170-42.50	755-39.73	282-28.20
	3		292-73.00	1140-60.00	620-62.00
	4		68-17.00	226-11.89	162-16.20
	5		147-36.75	782-41.15	393-39.30
	6		219-34.75	1168-61.47	456-45.60
			4 boys tested	19 boys tested	10 boys tested
Garfield	1	416-52.00	447-44.70	536-38.28	NONE
	2	126-15.75	218-21.80	234-16.71	
	3	500-62.50	471-47.10	721-51.50	
	4	131-16.37	219-21.90	308- 22.00	
	5	276-34.50	303-30.30	368-26.28	
	6	450-56.25	602-60.20	776-55.42	
		8 boys tested	10 boys tested	14 boys tested	

VI. The next calculation involves the percentage of the total possible points scored by each class in each event. For example, at Garfield Class A made 361 points of a possible 1,600, giving that class a percentile of 22.56 per cent. This method was followed in the table to give the corresponding results of each event in each class of each school. The table is for both testings and the improvement. When there was only one boy in a class in at least one of the testings, no comparison was made. The mean scores being the same as the percentiles shown, a separate mean table was not included.

TABLE XIII

TOTAL POSSIBLE CLASS POINTS PERCENTILE
FIRST TESTING

School	Event	Class A	Class B	Class C	Class D	Class E	Class F
Garfield	1	361-22.56%	284-25.81%	239-29.87%	79-26.33%	36-18.00%	None
	2	209-13.06	82-07.47	123-15.37	40-13.33	51-25.50	
	3	847-52.93	644-58.54	354-44.25	171-57.00	96-48.00	
	4	275-17.18	212-19.27	132-16.50	135-45.00	94-47.00	
	5	190-11.87	316-28.72	214-26.75	86-28.16	109-65.50	
	6	679-42.43	653-59.36	617-77.12	163-54.33	131-65.50	
		16 boys tested	11 boys tested	8 boys tested	3 boys tested	2 boys tested	
State	1	827-59.07%	732-56.30%	440-63.42%	128-64.00%	67-67.00%	None
	2	314-22.42	331-25.46	220-31.42	22-31.42	30-30.00	
	3	508-36.28	528-40.01	238-34.00	69-34.50	33-33.00	
	4	245-17.50	233-17.92	149-21.28	9-04.50	1-01.00	
	5	430-20.71	514-39.53	320-45.71	60-30.00	48-48.00	
	6	566-40.42	701-53.92	317-45.28	34-17.00	51-51.00	
		14 boys tested	13 boys tested	7 boys tested	2 boys tested	1 boy tested	
Wiley	1	611-29.09%	732-56.30%	252-31.50%	44-22.00%	7-07.00%	38-38.00
	2	340-16.19	262-17.46	150-18.75	58-29.00	0-00.00	39-39.00
	3	1194-56.85	999-66.60	480-60.00	78-39.00	36-36.00	57-57.00
	4	336-16.00	223-14.86	172-21.50	25-12.50	0-00.00	31-31.00
	5	345-16.42	419-27.93	222-27.75	51-25.50	0-00.00	30-30.00
	6	788-37.52	648-43.20	412-51.50	47-23.50	15-15.00	46-46.00
		21 boys tested	15 boys tested	8 boys tested	2 boys tested	1 boy tested	1 boy tested

TABLE XIV

TOTAL POSSIBLE CLASS POINT PERCENTAGES
SECOND TESTING

School	Event	Class A	Class B	Class C	Class D	Class E
Garfield	1	745-41.39%	553-46.08%	286-40.85%	89-45.50%	None
	2	726-40.33	189-15.45	179-25.57	73-36.50	
	3	975-54.16	672-56.00	333-47.57	96-48.00	
	4	318-17.66	317-26.41	190-27.14	108-54.00	
	5	409-22.72	499-41.58	196-28.00	117-58.50	
	6	1029-57.16	731-60.91	362-51.17	144-72.00	
		18 boys tested	12 boys tested	7 boys tested	2 boys tested	
State	1	1610-84.73%	961-87.36%	161-80.50%	82-82.00%	
	2	650-34.21	474-43.09	35-17.50	23-23.00	
	3	1180-62.10	698-63.45	108-52.00	66-66.00	
	4	260-13.68	182-16.54	8-04.00	6.06.00	
	5	703-37.00	534-48.54	58-29.00	27-27.00	
	6	1023-53.84	668-60.72	74-37.00	51-51.00	
		19 boys tested	11 boys tested	2 boys tested	1 boy tested	
Wiley	1	881-28.30%	527-52.70%	78-39.00%	None	6-06.00%
	2	510-22.17	290-29.00	78-39.00		3-03.00
	3	1604-69.73	724-72.40	126-63.00		48-48.00
	4	382-16.60	251-25.10	57-28.50		0-00.00
	5	639-27.78	477-47.70	97-48.50		21-21.00
	6	1135-49.34	569-56.90	95-47.50		40-40.00
		23 boys tested	10 boys tested	2 boys tested		1 boy tested

TABLE XV

TOTAL POSSIBLE CLASS POINTS PERCENTILE IMPROVEMENT

School	Event	Class A	Class B	Class C	Class D	Class E
Garfield	1	18.83	20.27	10.98	19.17	
	2	27.27	8.30	10.20	23.20	
	3	1.23	7.46	3.32	-09.00	
	4	0.48	7.14	10.64	09.00	
	5	10.85	13.86	1.25	29.84	
	6	14.73	3.55	-25.41	17.47	
State	1	25.56	31.06	27.08		
	2	11.79	17.63	-13.92		
	3	25.82	23.44	18.00		
	4	03.82	1.38	-17.28		
	5	06.29	9.01	-16.71		
	6	13.42	6.80	-08.28		
Wiley	1	09.21	15.70	07.50		
	2	05.98	11.54	20.25		
	3	12.88	5.80	03.00		
	4	00.60	10.24	07.00		
	5	11.36	19.77	20.75		
	6	11.82	13.70	-04.00		

Each class score on the previous table was compared, and the results are shown on the following tables. Classes E and F were not compared because the number of boys that fell in those classes was too few to give the results any significance. In the squares are found numbers and letters. For example, in the push-up event scores comparison, Wiley's Class B excelled Garfield's Class A by a margin of .77 per cent. The number in the square denotes the percentage of superiority and the letter, the superior school.

TABLE XVI

FIRST TESTING

TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES A-B

		WILEY - Class B.						GARFIELD - Class B.					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class B	1												11.2 (W)
	2											10.0 (W)	
	3										8.06 (W)		
	4									4.41 (G)			
	5								0.79 (G)				
	6							5.44 (G)					
STATE Class B	1						19.3 (S)						30.5 (S)
	2					8.00 (S)						18.0 (S)	
	3				26.0 (W)						17.9 (G)		
	4			3.06 (S)						1.35 (G)			
	5		11.6 (S)						10.8 (S)				
	6	10.7 (S)						5.44 (G)					
GARFIELD Class B	1												
	2												
	3												
	4												
	5												
	6												

TABLE XVI (Continued)

FIRST TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES A-B

		WIIEY - Class B.						GARFIELD - Class B.					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class A	1						3.25 (A)						3.28 (W)
	2					6.61 (A)						8.74 (W)	
	3				5.61 (B)						1.69 (G)		
	4			2.09 (B)						3.27 (G)			
	5		16.9 (B)						12.3 (G)				
	6	16.9 (B)						21.8 (G)					
STATE Class A	1						22.1 (S)						33.3 (S)
	2					4.96 (S)						14.9 (S)	
	3				30.3 (W)						22.3 (G)		
	4			2.64 (S)						1.77 (G)			
	5		2.78 (S)						1.99 (S)				
	6	2.78 (W)						18.9 (G)					
GARFIELD Class A	1						14.4 (W)						
	2					4.40 (W)							
	3				13.7 (W)								
	4			3.32 (G)									
	5		16.1 (W)										
	6	0.77 (W)											

TABLE XVI (Continued)

TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES A-B

Event		WILEY - Class A						Garfield - Class A					
		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class A	1												6.53 (W)
	2											3.13 (W)	
	3										3.92 (W)		
	4									1.18 (G)			
	5								4.55 (W)				
	6							15.1 (G)					
STATE Class A	1						29.9 (S)						36.5 (S)
	2					6.23 (S)						9.36 (S)	
	3				20.6 (W)						16.6 (G)		
	4			1.50 (S)						0.32 (S)			
	5		14.3 (S)						18.8 (S)				
	6	2.90 (S)						2.01 (G)					
GARFIELD Class A	1												
	2												
	3												
	4												
	5												
	6												

TABLE XVI (Continued)

FIRST TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES A-B

		WILEY - Class A						Garfield - Class A					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class B	1												
	2												
	3												
	4												
	5												
	6												
STATE Class B	1						2.72 (S)						33.7 (S)
	2					9.27 (S)						12.4 (S)	
	3				16.2 (W)						12.3 (G)		
	4			1.92 (S)						0.74 (S)			
	5		23.1 (S)						27.7 (S)				
	6	16.4 (S)						11.5 (S)					
GARFIELD Class B	1												7.91 (B)
	2											1.27 (B)	
	3										9.75 (B)		
	4									1.14 (A)			
	5								11.5 (B)				
	6							5.68 (B)					

TABLE XVII

FIRST TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES C-D

	Event	WILEY * Class D						GARFIELD - Class D					
		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class C	1						9.50 (C)						5.17 (W)
	2					10.3 (D)						5.42 (W)	
	3				21.0 (C)						3.00 (W)		
	4			9.00 (C)						23.5 (G)			
	5		2.25 (C)						0.91 (G)				
	6	28.0 (C)						2.83 (G)					
STATE Class C	1						41.4 (S)						37.1 (S)
	2					2.42 (S)						18.1 (S)	
	3				5.00 (W)						23.0 (G)		
	4			8.78 (S)						23.7 (G)			
	5		20.2 (S)						17.1 (S)				
	6	21.8 (S)						9.00 (G)					
GARFIELD Class C	1						7.87 (G)						
	2					13.6 (W)							
	3				5.25 (G)								
	4			4.00 (G)									
	5		1.25 (G)										
	6	53.6 (G)											

TABLE XVII (Continued)

FIRST TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES C-D

		WILEY - Class C						GARFIELD - Class C					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class C	1												1.63 (W)
	2											3.38 (W)	
	3										15.8 (W)		
	4									5.00 (W)			
	5								1.00 (W)				
	6							25.6 (G)					
STATE Class C	1						31.9 (S)						33.6 (S)
	2					12.7 (S)						16.1 (S)	
	3				26.0 (W)						10.3 (G)		
	4			0.22 (W)						4.78 (S)			
	5		17.9 (S)						19.5 (S)				
	6	6.22 (W)						31.8 (G)					
GARFIELD Class C	1												
	2												
	3												
	4												
	5												
	6												

TABLE XVII (Continued)

FIRST TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES C-D

		WILEY - Class C						GARFIELD - Class C					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class D	1												
	2												
	3												
	4												
	5												
	6												
STATE Class D	1						32.5 (S)						34.1 (S)
	2					7.75 (W)						4.37 (S)	
	3				22.5 (W)						9.75 (G)		
	4			17.0 (W)						12.0 (G)			
	5		8.25 (S)						3.25 (S)				
	6	34.5 (W)						60.1 (G)					
GARFIELD Class D	1												3.54 (C)
	2											2.04 (C)	
	3										12.8 (D)		
	4									28.5 (D)			
	5								1.91 (D)				
	6							22.8 (C)					

TABLE XVII (Continued)

FIRST TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES C-D

Event		WILEY - Class D						GARFIELD - Class D					
		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class D	1												4.33 (G)
	2											15.7 (W)	
	3										18.0 (G)		
	4									32.5 (G)			
	5								3.16 (G)				
	6							30.8 (G)					
STATE Class D	1						42.0 (S)						37.7 (S)
	2					18.0 (W)						2.33 (G)	
	3				4.50 (W)						22.5 (G)		
	4			8.00 (W)						40.5 (G)			
	5		4.50 (S)						1.34 (S)				
	6	6.50 (W)						37.3 (G)					
GARFIELD Class D	1												
	2												
	3												
	4												
	5												
	6												

TABLE XVIII

FIRST TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES A-C

Event		WILEY - Class C						GARFIELD - Class C					
		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class A	1												0.78 (G)
	2											0.82 (W)	
	3										12.6 (W)		
	4									0.50 (G)			
	5								10.3 (G)				
	6							39.6 (G)					
STATE Class A	1						26.6 (S)						29.2 (S)
	2					3.67 (S)						0.82 (S)	
	3				23.7 (W)						12.6 (S)		
	4			4.00 (W)						0.50 (G)			
	5		2.96 (S)						10.3 (G)				
	6	11.1 (W)						39.6 (G)					
GARFIELD Class A	1												7.31 (C)
	2											2.31 (C)	
	3										8.68 (A)		
	4									0.68 (A)			
	5								14.9 (C)				
	6							34.7 (C)					

TABLE XVIII (Continued)

FIRST TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES A-C

		WILEY - Class A						GARFIELD - Class A					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class C	1						2.41 (C)						8.94 (W)
	2					2.56 (C)						5.69 (W)	
	3				3.15 (C)						7.07 (W)		
	4			5.50 (C)						4.32 (W)			
	5		11.3 (C)						15.9 (W)				
	6	13.9 (C)						9.07 (W)					
STATE Class C	1						34.3 (S)						40.9 (S)
	2					15.2 (S)						18.4 (S)	
	3				22.9 (W)						18.9 (G)		
	4			5.28 (S)						4.10 (S)			
	5		28.3 (S)						33.8 (S)				
	6	7.76 (S)						2.85 (S)					

TABLE XIX

TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES B-C
FIRST TESTING

		WILEY - Class C						GARFIELD - Class C					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class B	1												7.13 (W)
	2											2.08 (W)	
	3										22.4 (W)		
	4									50.1 (W)			
	5								11.9 (G)				
	6							33.9 (G)					
STATE Class B	1						14.8 (S)						7.13 (S)
	2					6.71 (S)						1.09 (S)	
	3				19.4 (W)						22.4 (S)		
	4			3.58 (W)						1.64 (G)			
	5		11.8 (S)						1.18 (S)				
	6	2.42 (S)						11.1 (G)					
GARFIELD Class B	1												4.06 (C)
	2											7.92 (C)	
	3										14.3 (B)		
	4									3.27 (B)			
	5								1.97 (B)				
	6							17.8 (C)					

TABLE XIX (Continued)

FIRST TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES B-C

		WILEY - Class B						GARFIELD - Class B					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class C	1						5.50 (B)						5.69 (W)
	2					1.29 (C)						11.3 (W)	
	3				6.60 (B)						1.46 (W)		
	4			6.74 (C)						2.23 (W)			
	5		0.18 (B)						0.97 (G)				
	6	8.30 (C)						7.86 (G)					
STATE Class C	1						26.4 (S)						37.6 (S)
	2					14.0 (S)						28.9 (S)	
	3				32.6 (W)						24.5 (G)		
	4			6.42 (S)						2.01 (S)			
	5		2.07 (S)						17.0 (S)				
	6	26.2 (W)						14.1 (G)					

TABLE XX

FIRST TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES B-D

		WILEY - Class D						GARFIELD - Class D					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class B	1												10.7 (W)
	2											4.13 (W)	
	3										9.60 (W)		
	4									30.1 (G)			
	5								0.73 (G)				
	6							11.1 (G)					
STATE Class B	1						34.3 (S)						29.9 (S)
	2					3.54 (W)						12.1 (S)	
	3				1.61 (S)						16.4 (G)		
	4			7.42 (S)						27.1 (G)			
	5		14.0 (S)						10.8 (S)				
	6	30.4 (S)						0.41 (G)					
GARFIELD Class B	1												1.54 (B)
	2											5.88 (D)	
	3										1.54 (B)		
	4									25.7 (D)			
	5								0.06 (B)				
	6							5.30 (B)					

TABLE XX (Continued)

FIRST TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES B-D

		WILEY - Class B						GARFIELD - Class B					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class D	1						15.0 (B)						3.18 (G)
	2					11.2 (D						11.6 (W)	
	3				27.6 (B)						19.5 (G)		
	4			2.36 (B)						6.77 (G)			
	5		2.43 (B)						3.22 (G)				
	6	19.7 (B)						35.9 (G)					
STATE Class D	1						27.0 (S)						39.1 (S)
	2					6.46 (W)						3.55 (S)	
	3				32.1 (W)						24.0 (G)		
	4			10.4 (W)						4.77 (G)			
	5		3.07 (S)						1.28 (S)				
	6	26.2 (W)						42.4 (G)					

TABLE XXI

FIRST TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES A-D

		WILEY - Class D						GARFIELD - Class D					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class A	1												2.76 (W)
	2											2.86 (W)	
	3										0.35 (G)		
	4									29.0 (G)			
	5								12.2 (G)				
	6							16.8 (G)					
STATE Class A	1						37.1 (S)						32.7 (S)
	2					6.5 (W)						9.09 (S)	
	3				2.72 (W)						20.7 (G)		
	4			5.0 (S)						27.5 (G)			
	5		5.21 (S)						2.06 (S)				
	6	16.9 (S)						13.9 (G)					
GARFIELD Class A	1												3.77 (D)
	2											0.27 (D)	
	3										4.07 (D)		
	4									27.8 (D)			
	5								16.8 (D)				
	6							11.9 (D)					

TABLE XXI (Continued)

FIRST TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES A-D

		WILEY - Class A						GARFIELD - Class A					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class D	1						7.09 (A)						0.56 (G)
	2					2.81 (D)						15.9 (W)	
	3				17.8 (A)						13.9 (G)		
	4			3.50 (A)						4.68 (G)			
	5		9.09 (D)						1.63 (W)				
	6	14.0 (A)						18.9 (G)					
STATE Class D	1						34.9 (S)						42.6 (S)
	2					5.19 (W)						2.06 (G)	
	3				22.4 (W)						18.43 (G)		
	4			1.50 (W)						2.68 (G)			
	5		13.6 (S)						18.1 (S)				
	6	20.5 (W)						25.4 (G)					

In the second testing comparisons Class D of Wiley and State were not included as the comparison would be of only one boy to many others. This type of comparison would be unfair and far from valid.

TABLE XXII

SECOND TESTING
TOTAL POSSIBLE CIASS POINT PERCENTILE COMPARISONS CLASSES A-B

		WILEY - Class B						GARFIELD - Class B					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class A	1												49.1 (W)
	2											20.9 (G)	
	3										6.28 (W)		
	4									0.06 (W)			
	5								20.8 (G)				
	6							10.4 (G)					
STATE Class A	1						11.3 (W)						43.3 (S)
	2					11.3 (S)						6.12 (G)	
	3				17.2 (W)						7.94 (S)		
	4			7.34 (W)						3.98 (G)			
	5		15.0 (W)						14.3 (S)				
	6	0.26 (S)						3.32 (G)					
GARFIELD Class A	1						11.3 (W)						
	2					11.3 (G)							
	3				18.2 (W)								
	4			7.44 (W)									
	5		25.0 (W)										
	6	0.26)G)											

TABLE XXII (Continued)

SECOND TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES A-B

Event		WILEY - Class A						GARFIELD - Class A					
		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class B	1						14.4 (B)						
	2					6.83 (B)							
	3				2.67 (B)								
	4			8.50 (B)									
	5		19.8 (B)										
	6	6.56 (B)											
STATE Class B	1						49.1 (S)						46.0 (S)
	2					20.9 (S)						2.76 (S)	
	3				6.28 (W)						8.29 (S)		
	4			0.06 (W)						1.12 (G)			
	5		20.7 (S)						25.8 (S)				
	6	11.4 (S)						3.46 (S)					
GARFIELD Class B	1												4.69 (B)
	2											24.6 (A)	
	3										1.84 (B)		
	4									8.75 (B)			
	5								18.9 (B)				
	6							3.75 (B)					

TABLE XXII (Continued)

SECOND TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES A-B

		WILEY - Class A						GARFIELD - Class A					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class A	1						45.4 (S)						2.09 (G)
	2					12.0 (S)						18.2 (G)	
	3				15.6 (W)						15.6 (W)		
	4			1.06 (S)						1.06 (G)			
	5		5.06 (W)						5.06 (W)				
	6	7.82 (S)						7.82 (G)					
STATE Class A	1												43.3 (S)
	2											4.12 (G)	
	3										7.94 (S)		
	4									3.98 (G)			
	5								14.3 (S)				
	6							3.22 (G)					

TABLE XXII (Continued)

SECOND TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES A-B

	Event	WILEY - Class B 6	5	4	3	2	1	GARFIELD - Class B 6	5	4	3	2	1
WILEY Class B	1												6.62 (W)
	2											13.3 (W)	
	3										16.4 (W)		
	4									1.31 (G)			
	5								6.12 (W)				
	6							4.01 (G)					
STATE Class B	1						34.7 (S)						41.3 (S)
	2					14.1 (S)						29.3 (S)	
	3				8.95 (W)						7.45 (S)		
	4			8.56 (W)						9.87 (G)			
	5		0.84 (S)						6.96 (S)				
	6	3.82 (S)						0.19 (G)					

TABLE XXIII

SECOND TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES C-D

Event		WILEY - Class C						GARFIELD - Class C					
		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class C	1												1.85 (G)
	2											13.4 (W)	
	3										15.4 (W)		
	4									1.36 (W)			
	5								20.5 (W)				
	6							4.21 (G)					
STATE Class C	1						41.5 (S)						
	2					21.5 (W)							
	3				11.0 (W)								
	4			0.50 (S)									
	5		19.5 (W)										
	6	9.50 (W)											
GARFIELD Class D	1												4.65 (D)
	2											10.9 (D)	
	3										0.43 (D)		
	4									26.8 (D)			
	5								30.5 (D)				
	6							20.3 (D)					

TABLE XXIII (Continued)

SECOND TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES C-D

Event		WILEY- Class D						GARFIELD - Class D					
		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class C	1												6.50 (G)
	2											2.0 (W)	
	3										15.0 (W)		
	4									26.5 (G)			
	5								6.50 (G)				
	6							24.5 (G)					
STATE Class C	1												35.0 (S)
	2											19.0 (G)	
	3										4.0 (S)		
	4									50.0 (G)			
	5								29.5 (G)				
	6							35.0 (G)					

TABLE XIV

SECOND TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES B-D

Event	GARFIELD - Class D						GARFIELD - Class B					
	6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class B						7.20 (W)						
					7.50 (G)							
				24.4 (W)								
			28.9 (G)									
		10.8 (G)										
	15.1 (G)											
STATE Class B						41.9 (S)						
					6.59 (S)							
				15.4 (S)								
			37.5 (G)									
		9.96 (G)										
	11.3 (G)											
GARFIELD Class D												6.58 (B)
											20.8 (D)	
										8.0 (B)		
									6.42 (D)			
								2.41 (B)				
							11.1 (D)					

TABLE XXV

SECOND TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE
COMPARISONS CLASSES A-D

		GARFIELD - Class D					
	Event	6	5	4	3	2	1
WILEY Class A	1						7.20 (G)
	2					14.3 (G)	
	3				21.7 (W)		
	4			37.4 (G)			
	5		30.7 (G)				
	6	22.7 (G)					
STATE Class A	1						39.2 (S)
	2					2.29 (G)	
	3				14.1 (S)		
	4			40.3 (G)			
	5		18.2 (G)				
	6						
GARFIELD Class A	1						4.11 (D)
	2					3.83 (A)	
	3				6.16 (A)		
	4			36.3 (D)			
	5		35.8 (D)				
	6	14.8 (D)					

TABLE XXVI

SECOND TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES A-C

		WILEY - Class C						GARFIELD - Class C					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class A	1												2.55 (G)
	2											3.40 (G)	
	3										22.2 (W)		
	4									10.5 (G)			
	5								0.78 (W)				
	6							2.37 (G)					
STATE Class A	1						45.7 (S)						43.9 (S)
	2					4.79 (S)						8.64 (S)	
	3				0.90 (S)						14.5 (S)		
	4			14.8 (S)						13.5 (G)			
	5		11.5 (S)						9.00 (S)				
	6	6.34 (W)						2.13 (S)					
GARFIELD Class A	1												0.54 (A)
	2											14.8 (A)	
	3										8.59 (A)		
	4									9.48 (C)			
	5								5.28 (C)				
	6							5.45 (A)					

TABLE XXVI (Continued)

SECOND TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES A-C

Event		WILEY - Class A						GARFIELD - Class A					
		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class C	1						0.70 (C)						
	2					16.8 (C)							
	3				6.73 (A)								
	4			11.9 C)									
	5		20.8 (C)										
	6	1.84 (A)											
STATE Class C	1						42.2 (S)						39.1 (S)
	2					4.67 (W)						22.8 (G)	
	3				17.7 (W)						2.16 (G)		
	4			12.6 (W)						13.7 (G)			
	5		1.22 (S)						6.28 (S)				
	6	12.3 (W)						20.2 (G)					

TABLE XXVII

SECOND TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES B-C

		WILEY - Class C						GARFIELD - Class C					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class B	1												11.9 (W)
	2											3.43 (W)	
	3										24.8 (W)		
	4									2.04 (G)			
	5								19.7 (W)				
	6							5.20 (W)					
STATE Class B	1						48.4 (S)						46.5 (S)
	2					4.09 (S)						18.5 (S)	
	3				0.45 (S)						15.9 (S)		
	4			11.9 (W)						10.6 (G)			
	5		0.04 (S)						20.5 (S)				
	6	13.2 (S)						9.01 (S)					
GARFIELD Class B	1												5.23 (B)
	2											9.82 (C)	
	3										8.43 (B)		
	4									0.73 (C)			
	5								18.6 (B)				
	6							9.20 (B)					

TABLE XXVII (Continued)

SECOND TESTING
TOTAL POSSIBLE CLASS POINT PERCENTILE COMPARISONS CLASSES B-C

		WILEY - Class B						GARFIELD - Class B					
Event		6	5	4	3	2	1	6	5	4	3	2	1
WILEY Class C	1						13.7 (B)						7.08 (G)
	2					10.0 (B)						23.3 (W)	
	3				9.40 (B)						7.00 (W)		
	4			3.40 (C)						2.09 (W)			
	5		0.80 (C)						6.92 (W)				
	6	9.40 (B)						13.4 (G)					
STATE Class C	1						27.8 (S)						34.2 (S)
	2					11.5 (W)						1.75 (S)	
	3				20.4 (W)						4.00 (G)		
	4			21.1 (W)						22.4 (G)			
	5		18.7 (W)						12.6 (G)				
	6	19.9 (W)						23.9 (G)					

VII. The next situation includes the percentage ratings of class scoring of the total number of points actually scored in each event by each school. For example, at Wiley Class A scored 361 points in the base-running event of 1,497 points scored by all classes, giving that class a percentile scoring of 40.41 per cent of actual scored points. Similar findings and improvements will be found following.

TABLE XXVIII

CLASS SCORING OF ACTUAL POINTS PERCENTILES
FIRST TESTING

School	Event	Class A	Class B	Class C	Class D	Class E	Class F
Wiley	1	40.81	37.07	16.83	02.93	00.46	02.53
	2	37.90	30.86	17.66	06.83	00.00	04.59
	3	41.98	35.12	16.87	02.74	01.26	02.00
	4	42.69	28.33	21.85	03.17	00.00	03.93
	5	32.88	29.94	21.16	04.86	00.00	02.85
	6	40.08	35.65	20.95	02.39	00.76	02.33
State	1	37.62	33.30	20.20	05.82	03.04	NONE
	2	34.24	26.09	23.29	02.39	03.27	
	3	36.91	38.37	17.29	05.01	02.39	
	4	38.46	36.58	23.39	01.41	00.15	
	5	31.34	37.46	23.32	04.37	03.49	
	6	33.91	42.00	19.99	02.03	03.05	
Garfield	1	33.58	26.41	22.23	07.34	03.34	NONE
	2	41.38	16.23	24.35	07.92	10.09	
	3	40.10	30.49	16.76	08.09	04.54	
	4	32.42	25.00	15.56	15.91	11.08	
	5	20.76	34.53	23.38	09.39	11.91	
	6	30.27	28.31	27.50	07.26	05.84	

TABLE XXIX

CLASS SCORING OF ACTUAL POINTS PERCENTILES
SECOND TESTING

School	Event	Class A	Class B	Class C	Class D	Class E	Class F
Wiley	1	59.04	35.32	05.04			
	2	57.88	32.91	20.31			
	3	62.65	28.28	04.92			
	4	53.80	35.35	08.02			
	5	51.74	38.62	07.85			
	6	61.71	30.94	05.17			
State	1	58.67	35.02	05.86			
	2	54.99	40.10	02.96			
	3	57.50	34.01	05.26			
	4	57.01	39.91	01.75			
	5	53.17	40.39	04.38			
	6	55.50	36.24	04.01			
Garfield	1	44.53	33.05	17.09	05.31		
	2	81.20	21.14	20.02	08.16		
	3	46.96	32.36	16.04	04.62		
	4	36.76	36.64	21.96	12.48		
	5	33.49	40.86	16.05	09.58		
	6	45.41	32.25	15.97	06.35		

TABLE XXX

CLASS SCORING OF ACTUAL POINTS PERCENTILE IMPROVEMENT

School	Event	Class A	Class B	Class C	Class D	Class E	Class F
Wiley	1	18.23	01.75	-11.59			
	2	19.98	02.05	02.65			
	3	20.67	-06.84	-11.95			
	4	11.11	07.02	-13.83			
	5	18.86	08.68	13.31			
	6	21.63	-04.71	-15.78			
State	1	21.05	01.72	-14.34			
	2	20.75	04.01	-21.33			
	3	20.59	-04.36	-12.03			
	4	18.55	03.33	-21.64			
	5	21.83	03.93	-18.94			
	6	21.59	05.76	-14.98			
Garfield	1	10.95	07.64	-05.14	-02.03		
	2	39.82	04.91	-04.33	00.43		
	3	06.86	07.87	-00.72	-03.47		
	4	04.34	11.64	-06.40	-03.43		
	5	12.73	06.33	-07.33	00.14		
	6	15.14	03.94	-11.53	-00.19		

With these results of the testings and comparisons in mind, the author is able to make the summary and conclusions which make up Chapter V. The reader must take into consideration the fact that human beings of all ages are unpredictable and can not be forecast with any semblance of validity. Therefore, the facts set down in this chapter are actual and not padded in any way as to influence the outcome anticipated by the author at the beginning of this thesis. The summary and conclusions are also pure and unadulterated, based on the facts as they fell, with no prejudice or malpractice incorporated.

With these understandings established, the reader now turns to Chapter V to see what may be concluded from the results of the tests and the comparisons.

"I do not endeavor either by triumphs of confutation, or pleadings of antiquity, or assumption of authority, or even by the veil of obscurity, to invest these inventions of mine with any majesty. . . . I have not sought nor do I seek either to force or ensnare men's judgements, but I lead them to things themselves and the concordances of things, that they may see for themselves what they have, what they can dispute, what they can add and contribute to the common stock." _____ Francis Bacon

CHAPTER V

SUMMARY AND CONCLUSIONS

Chapter V is the climax of all the foregoing exhaustive research. From the results that have been tabulated, the author is able to make the conclusions incorporated in this chapter. At the very beginning the author wishes to extend purity of conscience to the reader. Regardless of the hunch expressed in Chapter I, there has been no shady juggling of the facts or figures to foster a desired result. The conclusions in this chapter are based on the results and comparisons of actuality. While the author possibly might have misinterpreted some fact, such was not done with malice aforethought with intent to satisfy personal ego and accomplish a pre-arranged conclusion. With this declaration established, the author offers the following conclusions.

All of the schools made a poor showing on the first testing, indicating either a marked lack of previous physical education instruction or general physical degeneration in the coming generation. The second testing showed gratifying score improvements, giving evidence of the practicability of the physical education programs. While each school disclosed improvement, the program of the Laboratory

School accomplished superior results, with the Garfield program showing the least capacity for improvement. This acknowledgement having been made, the author maintains that there is still much to be desired of the physical education programs in respect to developing the individual.

Whereas normal growth continued, physical capability, enhanced by the physical education programs, did not maintain an equal pace. The growth increase in Class A alone, being a maximum of 29.05 per cent and a minimum of 6.15 per cent, does not compare favorably with an improvement maximum of 3.95 per cent and a minimum of 1.71 per cent. But the fact that there was improvement is significant within itself. With so much time being wasted in this modern world, an instance of time utilization for the improvement of youth justifies the magnitude of the improvement regardless of the degree.

The physical education program in each school had its own particular characteristics, favorable and unfavorable. This is shown by the fact that the physical education program enabled the boys to make better improvement scores in some events while minor or even none at all in others. This may possibly be explained by the reason that one physical education program may emphasize the development of one large muscle group while neglecting another. This is not good practice. The physical education program, in the

opinion of the author, should strive to develop the individual as a whole. However, credit must be given where it is due. Wiley's improvement scores excelled the other schools in Events 4, 5, and 6. State made greater improvement scores in Events 1, 2, and 3. Garfield did not achieve any superior improvement scores.

Considering each event in the light of its possible point percentile improvements, it will be noticed that the premise of the foregoing paragraph is substantiated. The per cent of improvement ranged from -3.40 to 23.75. This is too wide a range. In the improvement comparisons State improved in nine cases over both schools, Wiley, six, and Garfield, three.

Improvement percentages, classified by class, showed varying degrees, corresponding somewhat to those of the group as a whole. The degrees of improvement had a greater range of difference, -25.41 per cent to 31.06 per cent. Other than the fact that it showed improvement in a great number of instances, it is not significant.

The data accumulated in this research were treated in practically every conceivable way. With all the tedious comparisons of the testings and improvements, the author can conclude in general only that there was improvement and that the physical education programs of the schools involved do have material value in helping develop the physical capa-

bilities of youth. However, the development is inconsistent with the basic physical education philosophy of development of the whole being. While the point is debatable, the author has the opinion that the improvement effects of the physical education programs leave much to be desired, especially in the magnitude of the same.

If the results of this thesis are considered indicative of prevailing national conditions, it may be said that the quality of the present day physical education programs has depreciated in comparison to war-time programs. There is much to be done in improving the physical education curriculum to raise the standards at least to war-time levels. In this unsettled world of confusion and war-like tempers, who can tell when youth will be called upon again to struggle for survival and a semblence of world peace? The backbone of a nation is its youth, and that youth must be physically prepared to meet all eventualities.

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APPENDIX

APPENDIX I

COZEN, TRIEB, AND NIELSON ACHIEVEMENT TEST

1. Class .....
2. Class .....

Name.....School.....

1. Grade.....Age....Yrs.....Mo.....Weight.....Height.....

2. Grade.....Age....Yrs.....Mo.....Weight.....Height.....

EVENTS

Event	DATE R	Score	DATE R	Score	Imp.
Base Running					
Basketball Throw for Accuracy 2 min.					
Jump and Reach					
Baseball Throw for Accuracy					
Pull-up					
Push-up					
	Total		Total		

APPENDIX II

CLASSIFICATION PLAN FOR SECONDARY BOYS[1]
Grades 7 to 12 inclusive

Exponent	Age	Height	Weight
9			53-59
10			60-65
11			66-71
12			72-78
13			79-84
14			85-90
15			91-96
16			97-103
17			104-109
18			110-115
19			116-121
20			122-128
21			129-134
22	10:9-11:2	47 down	135-140
23	11:3-11:8	47½-49	141-146
24	11:9-12:2	49½-51½	147-153
25	12:3-12:8	52 -53½	154-159
26	12:9-13:2	54 -55½	160-165
27	13:3-13:8	56 -57½	166-171
28	13:9-14:2	58 -59½	172-178
29	14:3-14:8	60 -62	179-184
30	14:9-15:2	62½-64	185-190
31	15:3-15:8	64½-66	191 up
32	15:9-16:2	66½-68	
33	16:3-16:8	68½-70½	
34	16:9-17:2	71 -72½	
35	17:3-17:8	73 -74½	
36	17:9-18:2	75 up	
37	18:3-18:8		
38	18:9-19:2		

Class	Exponent Value (Sum of exponents)
F	69 and below
E	70-74
D	75-78
C	79-82
B	83-87
A	88 and over

[1] Cozens, op. cit., pp. 41-3.