PHYSICAL EDUCATION

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PREFACE

The papers and essays in this book were written from time to time during the past twenty-five years, for the purpose of treating some of the urgent questions growing out of the newly awakened interest in physical education in America. Some of the papers were originally delivered as addresses before various educational and medical associations, and some have been printed as magazine articles.[1] The others appear here for the first time. Although the papers were not intended to be historical, they do, nevertheless, chronicle the earlier physical condition of the American people and the existing necessity for some form of physical training, as well as record the many difficulties which have had to be overcome during the past quarter of a century in the efforts to make physical education a part of the school and college curriculum.

In addition to the historical character of the book, certain chapters contain the principles and theories which the author has employed in evolving

[1] The author desires to thank D. Appleton & Co. and the *North American Review* for their courtesy in permitting the use of parts of articles previously published by them.

a comprehensive system of physical training. It is gratifying to note that many of the methods herein advocated have been already quite generally adopted, and that many of the evils criticised are being gradually overcome. It is believed, however, that the publication of these theories and principles in permanent form may be of service not only to those who are actually engaged in the work of physical education but also to all those who are striving in any way for the physical betterment of the people. The crying need of the hour is to get educators to recognize the fundamental importance of all forms of physical training and bodily activity as a basis for the cultivation of the higher mental and moral faculties. In this work an attempt has been made to place the training of the body upon the same educational basis as the training of the intellect, believing that this is the only rational way to meet the excesses and abuses of athleticism and to encourage the attainment of the highest ideals in mental and physical development. If these papers contribute in any degree to the realization of these ideals, the author will feel amply repaid for his pioneer efforts.

D. A. SARGENT

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CHAPTER I

PHYSICAL TRAINING

It would be an interesting study to investigate the history of physical training, and to trace the different opinions, events, and epochs which have shaped and characterized the development of this important branch of education. It would be even more interesting to trace the probable influence of different exercises upon the development of a people or a race. From the earliest records of the Persians and the Greeks we find bodily training playing an essential part in the education of youth. Later we find it assuming a military and gladiatorial aspect under the influence of the Roman emperors. With the dawn of Christianity all kinds of physical exercises fell into bad repute. They were revived again during the Middle Ages in the form of knightly tournaments, fencing matches, and festivals. In the seventeenth century they began to assume an educational and medical aspect in Germany, and were

introduced in modified forms into the schools of Norway, Sweden, Denmark, Switzerland, France, and Prussia. In England and Scotland they took the form of the athletic games of the Greeks and the competitive sports of the Middle Ages. In America the German system was first introduced in 1825, at Northampton, Massachusetts, by Dr. Beck (afterwards professor of Latin at Harvard College), who was a pupil of Dr. Jahn's in Germany. Dr. Follen carried on the same system of gymnastics in Boston and Cambridge in 1826–1827. Our athletic sports, such as running, jumping, putting the shot, throwing the hammer, and rowing, came to us through the descendants of English and Scotch settlers. Naturally enough, in all ages, the attention given to the body has been dominated largely by the differences in opinion concerning the nature and origin of the mind. Now, as the same spirit that animated the discussions of the past is present to-day, let us examine the physiological results of different schools as they have made themselves manifest on a colossal scale through the life and history of nations. We shall then be prepared to recognize the virtues and faults of each school, and make a selection of exercises that can be adapted to our own age and circumstances.

In developing the body the Greeks had three main objects in view: (1) the attainment of individual courage and strength as a means of national defense; (2) the establishment of a physical basis for mental development; (3) the cultivation of the beautiful in form and proportion. How well they attained the first object let the heroic struggle at Marathon answer. As the result of the second aim the Athenians raised themselves from a condition of semibarbarism to the summit of human intelligence in less than three hundred years, and the cultivation of the beautiful gave them the finest proportions ever attained by man, and left to us the best specimens of art that have ever been produced.

In the course of time, as Greece became more opulent and luxurious, war and maritime conquest no longer afforded legitimate outlets for accumulated physical vigor. The intellect found no guiding star in pagan philosophy, and moral sentiments were extinct. The love of the beautiful grew into a love for the voluptuous. As a consequence the nation fell a prey to the "madness of superfluous health" and buried herself in the lowest depths of licentiousness.

The physical exercises of the Roman youth varied greatly from those of the Greeks. The educational and the medical elements were wanting, and only

the crudest forms of exercises were practiced. Those naturally weak and in need of special training (as was Cicero) repaired to Greece, where they were soon made strong and vigorous. At a later period scientific gymnastics were introduced at Rome, and for a brief time occupied the attention of scholars and gentlemen. But the spirit of the beautiful which infused itself into the exercises of the Greeks found no sympathy in the hearts of the Roman people. They were by nature stern, martial, practical, and the energy of the nation was concentrated upon the development of its military legions. The soldiers were trained in swimming, climbing, and the bearing of heavy burdens, with the view to increasing their strength and physical hardihood and improving their marching and fighting ability.

The spoils of war brought increased wealth, and increased wealth its ever-accompanying habits of idleness and luxury. The scholars and gentlemen gave up physical exercises to which they had been accustomed and sought recreation and amusement in witnessing the physical exploits of others. The gymnasia and training grounds were given over to the professional athletes. These were encouraged and supported by the moneyed gentry, who found their return in the prizes won for them in the arena.

With pugilistic encounters began the gladiatorial combats. These brutal exhibitions aroused the latent animalism of the Roman masses and led to the most gigantic spectacles of human butchery and carnage that the world has ever seen. Internal strife and reckless dissipation soon followed, exhausting the nation's vital resources and making the brutal sports of the arena seem tame and unsatisfying.

All interest in physical exercise ceased with the downfall of the Roman Empire. Long before this time, however, the spirit of Christianity had begun to make itself felt throughout the imperial state. The desecration of physical culture in Greece had made the Christians feel that no good could come from the development of the body. The Roman persecutions were remembered with bitterness, and the awful orgies of the amphitheater had made physical prowess appear brutal and revolting. With the advance of Christianity the body began gradually to be neglected and despised. A powerful influence was exerted in this direction by the advocates of the intellectual principle which had been advanced by Anaxagoras many years before. With the Greeks the mind and body were treated as coworkers, the philosopher and gymnasiarch both giving instruction at the Academy and Lyceum.

But under the new dispensation body and mind were thought to have separate and opposing interests. Indeed, the body was considered to be the source of all evil and, as such, unworthy of honor. The Platonists, St. Augustine says, "hold that these our mortal members do produce the effects of fear, desire, joy, and sorrow in our bodies; from which four perturbations the whole inundations of man's enormities have their source and spring," which, in the light of physiological science, is only another way of saying that the condition of the body affects the state of the mind.

Actuated by such opinions, with the holiest and purest of motives, vast numbers of men and women began to withdraw themselves from all society and to try to live by contemplation alone. Some fled to the mountains and deserts, fed upon roots and grasses, and slept wherever night overtook them. Others buried themselves in convents, caves, and monasteries and mortified the body by hunger, thirst, and unremitting toil. Thousands upon thousands practiced the strictest asceticism, not only denying themselves food and sufficient raiment but, like Simeon on his lofty pedestal, even refusing to wash and be clean. During this period there was little intellectual strength and no physical hardihood.

Life centered around one idea, and that idea was twisted and contorted by the fervor and zeal of an overstimulated emotional nature.

A few centuries later fanaticism ran wild. Nations, like individuals, became possessed of strange delusions and morbid fancies. Millions of persons were simultaneously crazed with nervous excitement and emotional recklessness. Then came those terrible moral epidemics which have blackened the pages of history and hampered the progress of the Christian religion. Why need we speak of the "trials of innocence," the crusades, the rise and spread of the "flagellants," the wholesale murder of the Jews, and the "dancing mania"? All of these cruel delusions, pathologically speaking, come under the same category; all are to be attributed to the same physical conditions. Suddenly the excitement would abate, a brief prostration follow, and the people awake from their hallucination as from an ugly dream.

With the dawn of chivalry physical exercises were again revived and fashioned after the spirit of the age. With every knight his house was his castle, and there he felt bound to defend himself. Individual prowess was the backbone of chivalry, and consequently every exercise which was calculated to produce it was assiduously practiced. Here we have

fencing, boxing, wrestling, and horsemanship forming the essential parts of the system of a knight's training; and dancing must be added as an adjunct to his professional distinction "as the champion of God and the ladies." An intense interest in these accomplished exercises continued until the downfall of the feudal system.

A few centuries later great interest was awakened in physical training in Germany by Friedrich Ludwig Jahn. His system was modeled somewhat after that of the Greeks, with the athletic spirit left out. To develop the body and mind together was the primary object. To accomplish this purpose gymnastics were introduced into the schools, and exercises, such as declaiming and singing, were made a part of the regular curriculum in the *Turnhallen* and at gymnastic societies.

At the time Jahn began to establish his *Turnplatz* in Prussia, Germany was suffering under the galling oppression of the French, by whom she had lately been subjugated. Societies were organized for the purpose of producing a closer union among the young men and arousing them to patriotism. The excessive refinements of French manners, which had been introduced into Germany prior to the Revolution, had weakened and relaxed the sinews

of her youth and left them sickly and effeminate. Jahn was inspired with the desire to stay the demoralized tendencies of his countrymen and to regenerate them morally and physically. With this object in view he set to work; the result of the late Franco-Prussian War furnished us the sequel. But how were these conditions brought about? In reviewing the physical exercises of the Germans we find little stress put upon individual feats, but great attention given to class and squad exercises. The posturing and pyramiding, which owe their development largely to the Germans, illustrate this point. In them the success of the tableau, grouping, or act as a whole is the thing sought. Each participant sinks his individuality for the good of the cause. Perhaps the figure is a pyramid; one man may be drawn for the base, another for the middle, and a third for the apex. There are no best places; all are equally important. If one fails, the figure fails. Success depends upon joint interest and mutual responsibility.

In the Scottish contest and in British sports and games we find the spirit of rivalry and the mutual-fellowship interest combined. In the one case a man represents himself, in the other case his club or fraternity.

In the early history of America's settlement we find no necessity for physical training. Breaking up ground, clearing forests, and hunting Indians gave our forefathers all the exercise they needed, and the domestic duties of a frontier life kept our maternal ancestors free from nervous debility and muscular feebleness. With increased wealth, division of labor, and intensified mental life came the necessity for more physical exercise. How to meet this necessity is still the problem before us.

In briefly reviewing the subject from its historical point of view we get a comprehensive glimpse of possibilities and are better prepared to deal with drifts and tendencies in our own country. The life of a nation and the transactions of an age bring to light characteristics which are often masked in the life of an individual, and which, when reviewed retrospectively, show more clearly the relation of cause and effect.

The Greeks have taught us the danger of supreme physical development without moral stability. The Romans have shown us how easily refined sensibilities may become blunted and coarse animal instincts gain the ascendency. The early Christians have taught us the perils of neglecting the body, mortifying the flesh, and long suppressing the

natural sympathies and emotions. In the dashing and gallant knights we get the reflex influence of the accomplished arts — fencing, boxing, and horsemanship — which flourished in the age of chivalry. In the stolid but persistent drilling and marching of the German youth, and in their feats of the *Turnplatz*, which require unity, strength, and solidarity, we get the key to the qualities which have made them dig into the depths of science and literature, and have placed their nation in the foremost ranks both of the military and the thinking world.

In the football games of Rugby and Eton were developed the grit and tenacity that changed defeat to victory at Waterloo. The cricket matches and boat races at Oxford and Cambridge trained to vigorous manhood the champions of the church and the crown of England. In reading the works of Scott, Christopher North, and many of the Scottish divines, who can help thinking of their power in putting the shot, tossing the caber, and throwing the heavy hammer?

In physical education, as in almost every other subject of human interest, America has become the battle ground upon which Old World theories are being fought over again.

The descendants of the European countries come to us imbued with the customs and traditions of their people, and it is natural that they should adhere to those methods of physical training which they learned and practiced at home. Thus the Germans have brought us their turning associations with their elaborate gymnastics and school and field games; the English their boating, cricket, tennis, football, and athletic sports; the Irish their hockey, or hurley, and fondness for boxing and wrestling; the Scotchmen their Caledonian games; the Swedes their Swedish movements and gymnastics; and the French and Italians their different schools of fencing, dancing, and calisthenics. Many of these exercises have their origin in a remote past, and all of them have been more or less modified by the peculiar character of the nations through which they have been transmitted.

America has originated little in the way of physical exercises, excepting possibly the game of lacrosse, which was played by the Indians, and the game known as "bean bag," invented by Dr. Dio Lewis. But for a long time we have been absorbing by inheritance, immigration, imitation, and natural selection the various methods of physical training practiced by the European nations, and gradually

adapting them, as we have other methods of education, to meet the wants of our mixed population and peculiar institutions, and to suit the changes of our variable climate.

The attempt now being made in some of our cities to introduce physical exercises into the public schools has brought out the claims of our foreign population; and the right to discuss, as well as the right to vote, which belongs to every American citizen, has not left us much in doubt as to the opinion of many of our adopted brothers concerning the superiority of their own peculiar methods.

The Germans, the Swedes, and the English may justly claim to have made the most systematic attempts to improve the physique of their school children, the two former by their well-organized school gymnastics, and the latter through their highly prized out-of-door games. Some of our educators who have seen these school exercises practiced in the European countries are enthusiastic over their introduction into our own institutions, seemingly unmindful of the fact that in one form or another we have been practicing these exercises for more than fifty years. These advocates of the foreign systems sometimes say that we do not follow the exercises in their original purity and

simplicity; that we allow them to be combined with other forms and thus lessen their physiological effect by adulteration. Some would even have us give up our English sports and games and employ the German gymnastics only. Others think that both the English and German methods are brutal and heavy, and would have us abandon them in favor of the lighter and more graceful French and Italian calisthenics, or æsthetic gymnastics. Still another faction, not approving of the German or English exercises and claiming that the æsthetic movements as represented by the languid attitudinizing of the so-called Delsartians have nothing to recommend them, would have us adopt for our schools and colleges the Swedish or Ling system. Some of the American advocates of this particular system have been so extravagant in their claims, so unreasonable in their prejudices, and so persistent in their attempts to supplant other methods, that we cannot help thinking that they must be laboring under some strange misapprehension as to the fancied superiority of the Swedish methods as compared with all others.

It is unfortunate for the cause of physical education in America that any set of exercises should be taken up as a fad, be pursued for a time with

irrational zeal, and then dropped as a matter of no importance. It is also unfortunate that so much should have been said to the public about "methods" and "systems" and so little about the principles upon which all systems deserving the name are necessarily based.

Anatomy and physiology are the same the world over, and there cannot be a wide difference in school methods where the facts and principles taught by these sciences are adhered to. Knowing what is desired, it is an easy matter to prescribe the appropriate training. In this very fact lies an element of danger which it is well for us to consider. There should be a better understanding as to the physiology of exercise, a recognition of the supreme value of unity in development, and more information as to what constitutes the normal man for different races, ages, and conditions of life.

Until these questions are settled there will continue to be the widest differences in opinion as to the kind, amount, and place of physical training in a scheme of education. The present aspect of the subject in Europe and in this country furnishes illustrations to the point. Germany, tired of the dull, stereotyped exercises of the turnverein, is making a plea for sports and games. England,

perplexed with athletics run wild, is attempting to substitute a rational system of exercise for competitive sports. France and Sweden are beginning to realize that calisthenics and free movements, though beneficial in the cultivation of the graces, afford little exercise as such. These are the nations which have given us our ideas of physical training.

Inquire into the success of these systems as adopted in America and you will hear each upheld by its exponents, but investigate and you will find in every case the same defects that are now being recognized in the nations of their birth. Yet no one will deny that Germany, France, and England have done much for the physical training of their youth. In fact, as we have shown, the peculiar system of exercises adopted by each nation has been at once the outcome of the national type, and the means of intensifying it.

Who does not recognize in the high-shouldered, deep-chested, thin-flanked frame, in the melancholy disposition, in the unity and solidarity of the German youth, the effect of his favorite gymnastic apparatus and the posturing and pyramiding of the *Turnplatz?* In the lithe, graceful figure, the supple limbs, the vivacious spirit, and the love of the beautiful that dominate the soul of the French youth,

who does not see the effect of his calisthenics and light gymnastics? Broad shoulders, large loins, and heavy limbs, backed by dogged pluck and endurance, characterize the English youth. And where are these powers better developed than in the vigorous training for a boat race or in the trampling, jostling struggle for supremacy on the football field?

In considering the effects of different exercises from a national point of view we discover tendencies and results which would not always be apparent in individual cases. Germany, France, and England have developed systems peculiarly their own; each differs essentially from the others, and each produces a type well marked and characteristic. But, unfortunately, what was thought to be the strength of each system has proved to be its weakness. So long as they were little practiced the world knew nothing of their defects, but as soon as they began to receive more attention their special tendencies and peculiar developments made themselves manifest. Every advancement in the art of gymnastics, calisthenics, and athletics is attained at the expense of individual completeness and harmony of development. When excellence in particular feats and maneuvers is made the primary object of physical

training, special powers must necessarily be cultivated, and the result, in the end, will be injurious instead of beneficial to health. To enlarge upon this point it would be necessary to consider the physiology of exercise and to examine in detail the defects of the national training systems of which we have been speaking.

Germany's plea for athletic sports and games, England's call for less athleticism and more methodical exercise, and France's demand for more invigorating drills of the Swedish type are indications from which America should profit. What America most needs is the happy combination which the European nations are trying to effect,—the strength-giving qualities of the German gymnasiums, the active and energetic qualities of the English sports, the grace and suppleness acquired from the French calisthenics, and the beautiful poise and mechanical precision of the Swedish free movements, all regulated, systematized, and adapted to our peculiar needs and institutions.

CHAPTER II

THE PHYSICAL STATE OF THE AMERICAN PEOPLE

In considering the present condition of the American people and their need of a symmetrical physical training, as suggested in the previous chapter, we must bear in mind the difference in material environment which has come with the twentieth century. The mechanical inventions and the industrial development of the last fifty years profoundly affect the problem of the nation's physical condition.

In primitive societies physical strength and endurance were highly prized not only as a means of attack and defense but also as a means of procuring subsistence by subjugating nature and overcoming material obstacles. The changes wrought by modern civilization have rendered the service of a fine physique less apparent. Steam, gunpowder, and electricity are now doing the work and fighting the battles of the world, and they have increased the power of man a thousandfold. So puny seem the efforts of a human being when compared with these powerful

agents that we have almost ceased to regard physical vigor as one of the factors in human progress.

We believe that this mistaken idea has arisen from the tendency to consider the development of man as the means rather than the end of all endeavor.

It is true that the aggregated efforts of the people make the nation, with its myriad societies, industries, and institutions; but the nation thus constituted reacts upon the life and character of its people. This is the matter that most concerns us, for a government, like any other organized thing in nature, is dependent ultimately upon the physical condition of its individual units. Let us consider, therefore, some of the physical characteristics of the people who have contributed to the upbuilding of the nation, and in turn see how the progress of civilization and the development of the country have influenced our national physique.

The early settlers of this country were mostly hardy and vigorous persons, as only such would undertake the trials and difficulties incident to a pioneer life. The experiences which these early people underwent in felling forests, opening up the soil, fighting Indians, and trying to get a footing in the land tended to develop those who were naturally

strong and vigorous, and to cut off at an early period those who were weak and debilitated. The efforts to establish settlements and to meet their varied wants brought into healthy action all the faculties of mind and body, and stored up a rich inheritance of physical vigor for the generations that followed.

The experiences of our first settlers have been repeated in modified forms during the past two hundred years. The vast extent of unoccupied territory embraced by the United States has allured to our shores thousands of immigrants who have been disciplined in the rough school of a frontier life and who have bequeathed their acquired hardihood to their descendants. It cannot be said, however, that all the immigrants who followed the early colonists were of as good stock as that represented by the first comers.

The original settlers, especially in New England, Virginia, and the Carolinas, were largely of English descent, who brought with them good constitutions and some means of subsistence through their connection with the parent country. New York and Pennsylvania were first settled by the Dutch or Germans, while the French were the first to plant a colony in the Canadas. These three nationalities gave us the best inheritance of pure stock that came

to us from European countries, because these immigrants started from higher social strata than many of the other colonists and maintained their supremacy. Some parts of the country are still peopled by the direct descendants of the early English and German pioneers. Even the negroes who were first brought to the United States as slaves represented a much better stock than those who followed later, or those who were born and reared on our soil. The first importations of African blood were selected for their good physique and animal vigor, as it was not profitable to bring over cripples or persons with any marked physical defects.

The immigrants who began to come to America about the middle of the last century represented a much poorer quality of stock physically than those who had preceded them. Many were the feeble and dependent relatives of families whose more vigorous members had come here to make new homes for them. Many, not naturally enterprising or energetic, were attracted by the easy methods offered by the government of gaining possession of fertile lands, and still others represented the weaker specimens of the race who had been crowded out by the commercial struggle at home and had come to seek their fortunes in the new country. With this number

came the driftwood and riffraff thrown up by the revolutionary contests and internecine wars that had been going on for several years in Europe.

This large infusion of foreign blood of an inferior quality has undoubtedly impaired the physical status of our people as a whole. By this we mean that the average physique of the nation is not so good as it would have been if founded entirely upon the original stock planted here by the early colonists. This is made apparent by the superior physical and mental vigor shown by some of the old families in Massachusetts, New York, Pennsylvania, Virginia, Kentucky, and Tennessee, who trace their ancestry to the original colonists.

Notwithstanding the pollution of the original stock by later infusions, so rich was the country in its natural resources, especially in its food products, that up to 1860 our people had not only been able to maintain their physical status when compared with the parental stock, but in many instances foreigners coming to this country in early life had actually surpassed the natives at home in their average stature and weight. This is especially true of those foreigners who have settled in certain districts or states, as Illinois, Michigan, Wisconsin, Kentucky, and Tennessee.

The nature of the water, soil, atmosphere, or other material conditions abounding in these states seems to favor increase of stature and weight, for persons born in the eastern states who went west in their childhood surpass in physical measurements the average of the same class remaining in their native community.

Such differences in the stature and weight of the native-born foreigners of the several states, and more especially the differences in the measurements and physical qualities of the various nationalities that people our country, receive confirmation from military statistics of the Civil War. There is no severer test of the physical stamina of a people than that imposed upon them during a struggle with arms. The success of an army is so dependent upon the bodily condition of its men that, in summing up the essential requisites of the soldier, Napoleon put strength and endurance first and courage second. The examining surgeons are instructed to admit to military service only such men as are sound and vigorous and appear able to stand the trials, hardships, and deprivations incident to the soldier's life.

It cannot be claimed, therefore, that weaker specimens were selected from one race than from another, as the government was anxious that all should be

equally vigorous and well fitted for the service. The physical qualities exhibited by the soldiers of different races composing our volunteer army during the Civil War attest the leading characteristics which immigrants have thus contributed to our national physique. However, in treating of the physical qualities of these different races it is necessary to allude to many of their mental characteristics, which find expression in the form and structure of the body and which are often regarded as wholly physical.

Dr. Robert Bartholow, assistant surgeon in the United States Army during the Civil War, writes in his report on "The Various Influences affecting the Physical Endurance, the Power of resisting Disease, etc., of the Men composing the Volunteer Armies of the United States":

The races composing our volunteer army consisted chiefly of American, Celtic, Teutonic, Negro, and the mixed Spanish-American of New Mexico. The term "American" as here used does not mean the American Indian, but the composite of the many different races now inhabiting the continent. Of these races the American stands first in point of endurance displayed, while the other races follow in the order mentioned.

The physical qualities which fit the American for military service consist not so much in muscular development and height as in toughness of his muscular fiber and the freedom of his tissues from interstitial fat, whereby active and prolonged movements are much facilitated. In active service he fails more frequently from

defects in his digestive apparatus and from a phthisical tendency than from a lack of power due to imperfect physical development. The American's strong points mentally that fit him for military service are an intellectual hardihood which renders him superior to fatigue, an easy bearing under defeat, and a buoyant self-confidence which misfortunes do not easily depress.

The Celtic races possess similar qualities, and in respect to merely physical development are not unequal to the American, but they have less tenacity of purpose and mental hardihood.

As mercenary soldiers they did not exhibit the same zeal, energy, and power of endurance. They submitted with less patience than the Americans to the requirements of discipline, were frequently turbulent under hardships, and were given to complaints about the rations and fatigue duties.

The German element of the volunteer army did not equal the American or Celtic in physical capacity for military service. There are certain defects of structure, common in a greater or less extent to all Germans, which impair their powers of endurance, — a predominance of the lymphatic temperament: a patulous or unusual weakness of the abdominal muscles, flatness of the feet, and a tendency to a varicose condition of the veins of the inferior extremities.

The German carries into the military service many of the mental and moral qualities for which he is most conspicuous in civil life; namely, thrift, fondness for good living, and a love of ease and enjoyment. The first inclines him to serve for hire and to make the most of his opportunities for emolument; the second produces discontent, and even unfits him for service when the rations are deficient; and the third renders him restive under hardships and exposure.

The negro possesses many of the physical qualities pertaining to the highest type of the soldier, — sufficient height, a due

correspondence between height and weight, ample thorax, and considerable power of endurance. His chief physical defects are small, ill-developed calves and bad feet, and a proneness to disease, especially of the pulmonary organs. Having the faculty of imitation highly developed and being fond of the exterior show and parade of military life, he readily becomes an adept in the mechanical training of the soldier. The negro soldier is unquestionably less enduring than the white soldier, — less active, vigilant, and enterprising, and more given to malingering. The mulatto is feebler than the negro, invariably scrofulous, and more frequently the subject of pulmonary disease.

The mixed race of New Mexico is inferior to the negro. Of three regiments raised in New Mexico at the beginning of the war, scarcely one fifth were fitted for service. The chief defects were feebleness of constitution, impaired vision, deformities of the hands and feet, etc. They are cowardly, unreliable, and difficult to control, in consequence of a very mercurial temperament.

In commenting still further on the physical conditions most favorable to military service, the same authority that I have quoted says, in regard to the effect of previous occupation upon the physical health:

Those who pursue sedentary trades, who live much indoors, or who are exposed in the course of their business and pursuits to crowd poisoning, or to vitiated air from any cause, are by no means so well fitted for military service as those whose employments require them to spend much time in the open air, especially in the open air of the country. Hence farmers, lumbermen, and railroad men are better prepared to endure the hardships of a soldier's life than clerks, weavers, shoemakers, etc.

The physical conditions of the country, such as climate, soil, and water, have not changed much since 1860, and the opportunities for good nurture are perhaps better now than they were before that period. It may be seriously questioned, however, whether the changes that have taken place since the war in the social and business aspect of our national life are not bound to have a hurtful influence upon the physical stamina and constitutions of our people.

We have seen how the rough experiences of a pioneer life tested the fiber of our early settlers, and we have also seen how the hardships and deprivations of a national conflict at arms tried the mettle and endurance of the generation now passing away. But we cannot so readily detect the influences of our present mode of life, because they are less apparent to the casual observer. For this reason it is the more worth while to trace the genesis of the social changes and conditions that are absorbing the energies and affecting the character of our people, because it serves to illustrate the general truth, inculcated by Herbert Spencer, "that the indirect and unforeseen results of any cause affecting a society are frequently, if not habitually, greater and more important than the direct and foreseen results."

The general introduction of steam and electricity into all the affairs of life has stimulated human activity throughout the world. These forces have brought all communities and nations into close relations with each other and have greatly intensified the competitive spirit. Even the struggle with arms, — the determination of supremacy by war, — which was once the final resort of nations, has come to play a secondary part in the battle for national existence. So great is the expense of engaging in war, and so destructive are its agencies, due to the improvements in guns, battle ships, fortifications, and other equipment, that no nation can afford to enter upon a prolonged conflict unless it is richer than its adversary in accumulated treasure, in natural resources, and in food and industrial products.

Thus the struggle in which we are now and must for some time be engaged is an industrial and a commercial one. How to raise the best products, manufacture the best goods, and get all these to a market at the best prices, are problems which every community and every nation has to solve. To meet the competition growing out of this form of warfare not only implies improved implements and machinery and the best facilities for doing work and carrying on a business but it also implies another important

factor which until recent years seems almost to have escaped attention, namely, the improved physical condition of the individual laborer.

The amount of wealth lost to the community through sickness and inability to work is enormous. Unfortunately no statistics on the subject have been taken in this country, but the physical conditions of the people in England are closely enough allied to our own to enable us to draw instructive conclusions from their data. Sir James Paget, in an address delivered at the International Health Exhibition in London a few years ago, made the following statement: "I think that we cannot escape from the reasons to believe that we lose in England and Wales, every year, in consequence of sickness, twenty million weeks' work; or, say, as much work as twenty million healthy people would do in a week." And he adds further: "This is equal to about one fortieth part of the work done each year by the whole population between fifteen and sixty-five years old."

Reckon this lost service in terms of dollars and cents and apply it to our own country, with its greater population, and we shall find that the amount lost annually from what should be the nation's wealth would be over two hundred million dollars. If we should attempt to add to this sum the losses

from premature death and the unproductive efforts of those caring for the sick, — to say nothing of the loss of personal and domestic happiness, which is incalculable, — the amount would be large enough in a few years to wipe out completely our national debt.

When we consider that a large amount of this sickness, suffering, and premature death is preventable our responsibility in the matter becomes almost overwhelming. Most of the temporary sickness from which our people suffer arises simply from not knowing how to live. A little knowledge of personal hygiene would prevent much of it. The diseases due to intemperance and immorality are self-induced, and most of the minor accidents which disable our artisans are due to carelessness.

Were we not constantly making improvement in our efforts to avert the infectious fevers and the diseases that arise from poor food and filthy surroundings, we might indeed despair of improving the public health as our population increases, and the natural conditions of healthy living grow more unfavorable. While the national government still refuses to recognize the importance of appointing a commissioner of public health, it would seem as if the people, too, were not thoroughly alive to their

duty and responsibility in meeting and checking the spread of preventable diseases. Progress, however, is being made in this direction, and state boards of health and public health associations are extending their influence more widely every year.

Preventable diseases, though sometimes destructive to life and often great barriers to the accumulation of wealth, are not so lasting in their physical effects or so likely to produce constitutional changes in the race as diseases which are slower in their progress and not so easily discovered or prevented.

Undoubtedly certain ages, physical conditions, and residence in certain countries or particular districts in the same country, predispose one to certain diseases. The peculiar nature of the occupation or profession also renders one more likely to take on certain disordered conditions. This fact was brought out very prominently by the examinations of the drafted men during the Civil War.[1]

[1] See *Statistics, Medical and Anthropological, of the Provost Marshal General's Bureau, derived from Records of the Examination for Military Service in the Armies of the United States during the Late War of the Rebellion, of over a Million Recruits, Drafted Men, Substitutes, and Enrolled Men, compiled under the Direction of the Secretary of War*, by J. H. Baxter, A.M., M.D., Washington, 1875. A careful study of this volume will give one much valuable information as to the conditions that tend to affect the physical status of our people and help towards formulating some method of checking their deleterious influences. Space will permit me reference to only a few of the facts brought out by examinations of the drafted men.

It was found from these examinations that the states of Minnesota, Massachusetts, and Vermont furnished the largest ratio of men per thousand who were rejected for diseases of the digestive system. The New England states showed the largest ratio of rejections on account of diseases of the respiratory system. Consumption was found most prevalent along the seashore and least prevalent west of the Mississippi River. Maine, Rhode Island, and Massachusetts contributed the largest percentage of rejections from diseases of the circulatory system, and West Virginia, New Jersey, and Kentucky, the smallest. New England again led in the ratio of men refused on account of diseases of the nervous system, while the men from Iowa, New Jersey, and Missouri seemed to be most free from these disorders. Massachusetts, Maine, and Rhode Island furnished the largest ratio, and West Virginia, New Jersey, District of Columbia, and Ohio, the smallest ratio of men exempt from the draft on account of any disease.

The relation of occupation to disease, as shown by the examination of the drafted men, is also instructive because it shows the condition of men as they are found in daily life, and is a much better criterion than that furnished by the enlisted men, who may be said to represent a picked class in the community.

The diseases of the digestive system were the most frequent cause for rejection among all classes. The mercantile class, such as merchants, innkeepers, grocers, and clerks, furnished the largest number of those exempt from this cause. Then followed in order the professional class, such as lawyers, clergymen, physicians, teachers, and editors; the skilled workmen, represented by carpenters, painters, masons, blacksmiths, plumbers, etc.; and the unskilled laborers, composed of watchmen, fishermen, farmers, sailors, lumbermen, and porters.

The rejections from diseases of the circulatory system, including the heart and blood vessels, were next in frequency, and from these diseases the largest ratio of rejections was among the professional class, followed by the mercantile, skilled, and unskilled classes in the order named.

Consumption, the bane of our climate, claims the next largest percentage of rejections. The professional classes were most frequently exempt on account of the presence of this disease, then the mercantile, skilled, and unskilled classes.

Diseases of the nervous system were found among the mercantile, skilled, and unskilled classes, but most often among the professional classes; while disorders of the intellect found the largest number

of victims among the unskilled class of workmen, followed by the professional, skilled, and mercantile class in the order given.

The ratio of men that were rejected from these different classes on account of disease in general, was, in round numbers, 367 per thousand from all occupations, 520 per thousand from the professional class, 479 from the mercantile class, 434 from the skilled, and 348 from the unskilled laborers.

From the professional class the largest ratio of rejections was among the editors, being 739.7 per thousand; then followed the teachers with 739.5; physicians, 670; clergymen, 664; public officers, 627; dentists, 548; lawyers, 543; architects, 535; and finally, students at the rate of 328 per thousand.

Among the mercantile class the largest ratio of rejections is credited to the brokers, 670 per thousand, and the next largest to the merchants, with 602. Out of each thousand upholsterers examined 502 were rejected, which is the largest ratio of rejections from the skilled laborers; while the iron workers had only 189 rejections, which is the smallest. Among the unskilled workmen the watchmen were the most frequently rejected, their ratio being 697 to the thousand, while sailors, boatmen, firemen, miners, and soldiers furnished the

smallest ratio of those rejected from this class on account of disease. Soldiers, presumably those who had been in the regular service and had passed previous examinations, were credited with 183 rejections per thousand, which is the smallest ratio of exemptions of any occupation given; though the iron workers, with a ratio of 189 per thousand, would seem to be better representatives of the class of men engaged in industrial pursuits.

The examinations also brought out some interesting personal facts which are worth recording. It was clearly shown that all diseases were more prevalent among light-complexioned persons, and that those between twenty and twenty-five years of age and from sixty-three to sixty-nine inches in height were least affected with disorders that disabled them from military service.

Before attempting to draw any safe conclusions from these data, which are valuable on account of the large number of persons examined, it would be necessary to have access to many facts which do not appear to have been brought out by the method pursued. Nevertheless, the observations were so numerous that the law governing the frequency of error may be left to take care of the exceptional cases, and we shall be warranted in accepting the

general conclusions that climate, occupation, and social conditions affect the health and vigor of our people.

That over one half of all the persons drafted from the professional class during the war, and that over 46 per cent drafted from the mercantile class and 43 per cent from the skilled laborers should be rejected on account of physical disability and disease, are sad commentaries on our habits and conditions of working and living.

If we inquire into the influence of climate, occupation, and surroundings upon the rate of mortality, we find that living in certain communities and engaging in certain occupations under certain conditions do, undoubtedly, increase the death rate.

It is much to be regretted that some registrar general has not collected statistics on this subject for the United States, as Dr. William Farr has for England.[1]

[1] For full information on the effect of occupation on the causation of disease, the reader is referred to the following publications: "The Hygiene of Occupation," by Dr. Roger S. Tracy, published in Buck's *Hygiene and Public Health; Diseases of Modern Life*, by Dr. B. W. Richardson, D. Appleton & Co.; and a prize paper on "The Preventable Causes of Disease, Injury, and Death in American Manufactories and Workshops, and the Best Means and Appliances for Preventing and Avoiding Them," by George H. Ireland, Springfield, Massachusetts, published by the American Public Health Association; *A Manual of Practical Hygiene for Students, Physicians, and Medical Officers*, by Charles Harrington, M. D.

After reviewing this waste of energy and power from disease and death we naturally ask ourselves, Is it necessary? The individual lives in proportion to the rapidity with which the parts composing his organism die. The man who is going through a vigorous course of training, in which he is breaking down large quantities of old tissue and replacing it with new material, is much more active and energetic and capable of doing a greater amount of work than one in whom the molecular death rate of the organism, so to speak, is not so rapid or extensive. So it may be argued in regard to the life of a community or a nation: it lives in proportion to the activity or the destruction of its individual members.

Where civilization is most advanced, business competition sharpest, and social life most intense, there will be the greatest activity and destruction of the population and the greatest demand for new people to take the place of those removed. This destructive tendency is admirably illustrated in the life of our large cities, into which individuals enter as into a mighty furnace, and are consumed in order to generate the power that moves the machinery of the world and insures progress. But the individual, when at his highest state of activity, is in a more or

less perilous state of health, and easily lapses into that condition of body and mind recognized in the victims of overtraining. Here the breaking down of tissue and waste of substance has been greater than the amount absorbed by the organism, and a lessened amount of work or a change of conditions is necessary to restore the equilibrium. So it is with a nation. When it is in its highest state of activity and material prosperity there is the greatest danger that the destruction of individual life will be greater than nature can restore. The remedy must come in the way of something that lessens the demands on the energy of the individual, something that changes the conditions under which he lives and works or improves the nature and quality of his being.

Undoubtedly the American people work under a greater stimulus than any other people on the globe. The very atmosphere in the northern part of the country incites them to activity and makes them more nervous and energetic; while the influence of our free institutions, the absence of class distinction and restraints, the possibility of making a fortune or of attaining power and fame in some direction, contribute their share in spurring our people on to great mental and physical efforts. Add to these exciting causes the direct effect of the telegraph,

daily press, and means of rapid transit,—all of which not only bring us into immediate communication with our neighbors but with the whole civilized world,—and we begin to see that the strain upon the brain and nervous system is much greater than that imposed upon any other people. The question is, Can we stand it?

Within the past century our people have come to exhibit peculiar habits of mind and body, which foreigners term "American nervousness." Brain and nerve diseases are on the increase, and many common troubles of mind and body which make life miserable to multitudes undoubtedly arise from a lack of sufficient nerve force. Under this strain of living, with our present conditions and environments, thousands upon thousands will perish in their efforts to keep up with the pace of the age and to adapt themselves to the circumstances presented. Still it is encouraging to note that even under this great stress of living we are more than holding our own against the ravages of death and disease.

A large and growing proportion of our population, especially in the eastern cities, is beginning to adapt itself to the new environment and is improving its habits of living. There is much less of the rush and fury of business than there was ten or twenty years

ago. Men go to their work later and leave earlier; certain hours in the day are set apart for recreation; there are more holidays than there formerly were, and a longer time is given to summer vacations. Our people have much better food than their ancestors, and take much more time to prepare and eat it. Our clothing is better adapted to the needs of the system, and is worn in a manner less injurious to health than in former years. Our dwellings and business houses are better heated and ventilated than they were in the early part of this century, and all of the sanitary arrangements included under the head of plumbing, draining, and sewerage, have been much improved during the past few years. The accidents and diseases due to the following of certain trades and industries have been greatly lessened by the improved conditions under which they are carried on. Capitalists have learned that it actually pays to look after the health and comfort of those in their employ, — hence the sanitary improvements in workshops, warehouses, and all kinds of manufacturing establishments.

Even the dwelling houses of the poor, their schools, churches, and places for social gatherings, have all the modern conveniences, and many of them are looked after with as much care from a sanitary point

of view as the expensive hotels or the more pretentious residences of the wealthy classes.

Public commons, parks, and gardens are being laid out in our large cities, and these open-air spaces are doing great service in lessening the danger of crowd poisoning, which is so disastrous to certain classes of our urban population.

Under the combined influence of all these measures for the improvement of the health and comfort of the people, it is not surprising that the death rate in many cities has been perceptibly reduced and the average length of life increased one or two years. But as the evils which tend to destroy life or impair its usefulness are also on the increase, much more remains for us to do in order to fortify ourselves against them. A great deal can be done along the lines where reforms have already begun. We still need to improve the conditions of city life, to get rid of its accumulative filth, and to lessen its unnecessary noise. We need to relieve weary brains and irritable nerves of the jarring effect of walking and riding over rough pavements and the sudden starting and stopping of elevators and street cars. We still want better means of heating and ventilating city houses, and much could be gained for health in the warm season if rear yards and roof spaces were utilized for living purposes.

Those who work in the city should make their homes in the country, where change of air and scenery affords opportunity to relieve the tension upon eyes and ears, and to recuperate from the unconscious wear and tear upon nerves and brain.

A more extensive means of rapid transit into and out of the city is the great need of our time. The tendency of the people to herd in masses and to collect in the great centers of trade and industry can be relieved of its evil effects only by increasing the means of communication with the country and by encouraging people to go there to live and bring up their children. The sum of these improvements in the manner of living and working, trifling as they may seem, would soon produce improvements in the health and vigor of our people. But after everything has been done to better the environment and external surroundings there will still be a large proportion of the race that will fail to maintain a footing in the world for want of a better internal structure.

So rapid has been the development of the arts and sciences, with their new inventions, new methods, and new processes, that the human organism, as it exists in many families, has not yet had time to adapt itself to the new conditions imposed upon it. Hence the peculiar susceptibility to certain weaknesses

and diseases that characterize different families and follow the pursuit of certain occupations. Again, the division of labor, while it has increased skill and efficiency and added greatly to the total product of human industry, has robbed man of its beneficent influence as a means of general development. It has made it possible for one to earn a livelihood by the use of a very few muscles or faculties. Many men spend their lives in polishing a knife blade or pointing the head of a pin.

Where once a man's occupation kept him in good health he now has to give what health he has to his occupation and trust to other resources to make up the deficiency. As a consequence a large portion of our population never use half their faculties, and if they pursue the same employment for a term of years they are apt to acquire defects of structure, if not of constitution and character, that are transmitted to the next generation. Thus we have in operation a process of physical deterioration resulting from the overuse of a few faculties and the underuse of the others.

There are thousands of people earning their daily bread who never have occasion in their occupation to use the muscles of the upper part of their body. Few ever have occasion to raise the shoulders or lift the arms above the head; and it is difficult to

see how the vital processes of respiration and circulation can be properly carried on without the frequent use of the muscles about these regions. How much this local starvation of the body costs when accompanied by unfavorable external environments is shown by the statement that the difference in the physical status of the best Scotch agricultural population and the manufacturing population of the cities of Sheffield and Bristol, in England, is an average of five inches in height and thirty-one pounds in weight in favor of the farmers.

This difference in stature and weight is not confined to the farmers and those who work in the factories. The Anthropometric Committee from the British Association for the Advancement of Science showed by their investigations that growth and development receive a check as we descend lower and lower in the social scale, and that a difference of five inches exists between the average statures of the best and worst nurtured classes of children of corresponding ages, and three and a half inches in adults. Yet the political economists tell us that the deficiencies of occupation due to division of labor and want of suitable environments in which to work and live are made up by the training of our schools, the establishment of parks and playgrounds,

free reading rooms, libraries, concerts, and the like. These are all very well in a way and are doing much to educate and enlighten the masses; but the one thing above all others that our people need to enable them to meet the demands of civilization is a thorough system of physical education.

Happily the country is awakening to the importance of this subject and is putting forth efforts in several directions toward the attainment of better physiques among our population. The principal lines along which this interest in physical training has been developing are represented by our universities, colleges, and secondary schools, our Christian associations and social and industrial unions, and our city athletic clubs. Many hospitals, asylums, and private retreats for the feeble-minded and insane have added gymnasiums to their premises, and many private citizens have had rooms in their houses fitted up with gymnastic apparatus.

Perhaps the best indication of progress in this direction is the step taken by the park commissioners of Boston and other cities in establishing open-air gymnasiums and playgrounds in connection with the park systems.

The establishment of free municipal gymnasiums for use in the late fall and winter months, and the

equipment of rooms for gymnasiums and baths in connection with some of the great manufacturing industries, likewise indicate an advance in methods toward right living.

Great interest has also been awakened in field sports and track athletics during the past twenty-five years. Most colleges and schools have their regular playgrounds, and many of them have graded fields and running tracks, which have been constructed at considerable expense. Nearly all of the city athletic clubs have grounds where their athletes practice running, jumping, and like sports; and the Christian associations throughout the land are making efforts to secure similar facilities for the practice of open-air games among their members.

The great games of football and baseball have really become national in the breadth of interest they have awakened. The annual contests between the football teams representing Harvard, Princeton, and Yale universities frequently draw between twenty and forty thousand people from different parts of the country to witness the match that is to decide the championship for the season. The attention given to all sorts of physical exercises, including bicycling, tennis, boxing, rowing, bowling, canoeing and yachting, has greatly increased during

the last decades. The establishment of summer camps for boys during the long vacation period is a movement full of promise for health and vigor. At many of these camps opportunities are offered for hunting, fishing, swimming, rowing, canoeing, mountain climbing, cross-country walking, and a great variety of sports under the supervision of college athletes of good breeding and morals. This opportunity for city-bred boys to leave the dust and the dirt, the noise and the smoke, and the darkness of the city streets, and get back to nature under proper guidance and control will be one which intelligent parents will be sure to appreciate.

Could the direct and indirect influence of all this interest in physical exercises and healthy living be ascertained, the results would be surprising, and would go far to show why we are able to maintain our vigor as a people, against a trying climate and the enfeebling effects of our civilization.

CHAPTER III

PHYSICAL EXERCISE AND LONGEVITY

We have treated thus far what may be described as the historical aspect of our subject. Even more important is the question of the relation of exercise to the individual life. Life as commonly regarded is opposed to death, and the desire to prolong life is a natural and a commendable one. It is interesting, therefore, to inquire to what extent physical exercises and athletic sports contribute to this end, and what is the physiological process thereby involved.

In order that we may understand what exercise does for the body, it will be necessary to know something of the body's structure and functions. According to modern physiology our material body is composed of innumerable atoms and cells, which have been built up into various tissues, bones, muscles, and organs. Many of these cells correspond to the lowest forms of animal life and have their period of birth, activity, and death, just as other living organisms do. In his simplest state a man may be regarded as a community of organisms

capable of doing a certain amount of physiological work. This work consists in the maintenance of (1) animal heat, termed "calorific work"; (2) nervous or vital power, termed "internal work"; and (3) mechanical energy as muscular power, termed "external work."

Representing the standard of measurement by the force required to raise one pound one foot high, the amount of force expended daily by a man weighing one hundred and fifty pounds in the performance of these different kinds of work has been calculated to be about three thousand four hundred foot tons, — that is, the amount of force necessary to raise three thousand four hundred tons one foot from the ground. This expenditure is divided as follows:

Calorific work	2840 foot tons
Internal work	260 "
External work	300 "
	3400 foot tons

To meet this expenditure of force and maintain a footing in the world, a man must not only consume a certain amount of food but he must take care that this food is impartially distributed throughout his entire organism, and that every function gets its just share of the body's nutriment. Only three hundred foot tons of force or energy, or about eleven

per cent of the total amount available, can be expended in muscular work and leave enough for the performance of vital functions. A consideration of the nature, amount, and method of physical exercise necessary to maintain health and secure longevity is therefore of vital importance.

Regarding man as a community of atoms and cells, we find, singularly enough, that he flourishes as an individual in proportion to the death of these cells. This local death is going on at every moment and in every part of the living body. Individual cells are incessantly dying and being cast off, to be replaced by others which are as constantly coming into separate existence. This process of decay and death is greatly influenced by the activity of the bodily functions, which are all stimulated by muscular exercise.

But exercise is not only the chief agent in the destruction of the tissues; it is also the chief agent in their renovation and repair. Through its influence on respiration and circulation new material or liquid food is hurried forward in the blood, and the waste substance resulting from the oxidation is borne away more rapidly by the same agency. Thus it may be easily shown that judicious exercise not only improves the condition of all the muscles

brought into action, but through its stimulating effects upon the vital organs the health and tone of every other part of the system are improved. If, on the other hand, the exercise is not judicious, that is if it does not give sufficient employment to all the different muscles and organs; if it is partial, one-sided, or excessive; or if it is taken under unfavorable atmospheric conditions or constrained attitudes or positions, the results which follow will not be satisfactory but will surely tend to disease and death.

The physical effects of following too exclusively the various occupations of life furnish illustrations to the point. The sedentary life of the student, clerk, and professional man gives ample opportunity for the development of the brain; but unless some time is given to physical exercise the brain will be nourished at the expense of the other organs. Sluggishness of the liver, constipation, and digestive troubles will soon follow, and unless relieved a diseased condition will be established.

The evil effects of using excessively small groups of muscles is illustrated in the cramps and paralysis of penmen or writers, pianists, engravers, violinists, seamstresses, and telegraph operators. Public singers, speakers, actors, clergymen, and auctioneers

are frequently sufferers from a strained and swollen condition of the vocal cords and larynx, familiarly known as "clergyman's sore throat"; and musicians who play on wind instruments are subject to distention of the air cells of the lungs, in consequence of the strain brought upon them by the powerful use of the expiratory muscles. Porters, draymen, heavy iron workers, and a certain class of athletes often illustrate the effects of an excessive use of the muscular system. Where the body's nutriment is expended in this direction the impairment of heart or lung tissue is likely to follow.

The results of working with the body in a strained position are shown in the lives of printers, compositors, pressmen, shoemakers, cabinetmakers, and tailors. Dyspepsia, diarrhea, catarrh, pneumonia, and consumption are frequent among printers; while catarrh, rheumatism, and sciatica afflict the lives of coopers. Ruptures and swollen veins in the lower extremities are common among carpenters, and consumption cuts off a large portion of the cabinetmakers. Shoemakers and tailors are made flat-chested and round-shouldered by their occupations, and the muscles of the legs frequently become flaccid and withered from disuse. Constipation, sciatica, and muscular pains in the back, and a

predisposition to consumption are the prevailing tendencies in these two occupations.

While fresh air is an excellent thing, continuous exposure to the extremes of temperature, or exposure to alternations of cold and heat and to wind, rain, and snow, renders one liable to bronchial catarrh, pneumonia, and rheumatism. Boatmen, fishermen, farm laborers, hack, omnibus, and cart drivers are frequently afflicted with pulmonary affections and rheumatism. Bakers and cooks, blacksmiths, engineers, and stokers, who are exposed to extremes of heat, are similarly affected.

The bad effect of inhaling impure air in the form of irritating, poisonous, or offensive vapors and gases, or of irritating and poisonous dusts of animal, vegetable, or mineral origin, may be illustrated by the prevailing disorders among the laborers in a great variety of occupations which abound at the present day. Catarrhs, bronchial affections, skin eruptions, digestive troubles, and consumption are the diseases that most afflict the workers in metals and various mineral and vegetable compounds.

These are only a few of the occupations that tend to impair health and shorten life. In many instances this unfavorable tendency is due to the poor sanitary conditions under which work is carried on. In other

cases inherited weaknesses may render some persons susceptible to disease. But in the main the division of labor which calls into prolonged activity only a few of the faculties at a time is largely responsible for the tendency to physical degeneracy.

If the individual is especially ambitious to succeed and devotes himself assiduously to his chosen work without taking time for recreation, he may win the reputation of being the most skillful mechanic, the wealthiest merchant, or the ablest lawyer in the community; but unless he is extraordinarily endowed with physical resources, he will probably pay for his distinction by a disordered liver, enfeebled digestion, or weak lungs. In other words, the tendency of our civilization is to build up the trade, industry, profession, or institution at the expense of the individual. In this respect the institution or community in the social organism resembles the individual in the human organism, and as the human organism flourishes in proportion to the activity, destruction, and renovation of its individual atoms, so the institution and the community flourish in proportion to the activity, death, and replacement of human individuals.

To many readers of this work this view may seem a dreary aspect of life, and it may justly be asked,

Is this destruction of the individual necessary? This depends upon our idea of progress and civilization. If it be deemed necessary to crowd the normal work of an age into a century in order to realize the greatest prosperity, this rapid progress can only be attained by the sacrifice of individual strength, health, and completeness. A portion of our community recognize this fact and are making strenuous efforts to change the standard and realize higher ideals of human progress.

Although the division of labor narrows individual life and in many cases restricts individual development to a few muscles and faculties, it shortens the hours of labor and presents opportunities for improvement in other directions. In communities where efforts are made to improve the physique of the individual and better the sanitary conditions of his surroundings, life has been made longer and happier. This is especially true in countries that have given attention to public health and personal hygiene. The average life of the individual in England, for instance, has been raised from twenty-eight to thirty-four years within the past century, in spite of the rapid growth of large cities with their inevitable crowd poisoning and intense struggles for existence. The establishment of working boys' clubs,

church and Y.M.C.A. gymnasiums, athletic associations, and physical recreation societies has also done much everywhere to improve the physical condition of the masses; while golf, tennis, rackets, horseback riding, bicycling, rowing, and track and field sports are contributing much to the physical welfare of the well-to-do classes.

The grand aim in all sports and athletic exercises should be to make them supplement, so far as possible, the deficiencies in one's life work or occupation. Where the heart or lungs are weak from inactivity or breathing poisoned air, every effort should be put forth to improve the condition of these organs by appropriate exercises, such as gentle running and rowing. Where the muscles are soft and flabby from disuse, they should be strengthened by the use of dumb-bells, Indian clubs, or chest-weights; and so on through the wide range of developing and recreative exercises, which are admirably calculated to strengthen and improve the weak points in one's organism.

Many of the athletic sports, if pursued for pleasure or as recreation, are valuable remedial helps and aid physical improvement. Unfortunately, the spirit of emulation in athletics, which in some communities has grown into intense rivalry, is likely to lead

to excesses in training and practice, which, unless checked and brought down to a rational basis, may do more harm than good. Many young men seem to think that because the practice of athletics is favorable to health, the more they can get of this practice the better. This is a mistaken idea, for it is as possible to overwork in athletics as in business, and a great many young people injure themselves by excessive zeal in the practice of competitive exercise.

In physical as in mental activity there is a limit to human capability, and it is possible to develop the muscular and nervous systems to the detriment of the heart and lungs or of the digestive organs. But the conditions under which athletics are usually practiced are so favorable to the maintenance of health and vigor that few persons who were sound at the time of beginning their efforts have injured themselves by the practice of these vigorous exercises. It is true that some young men who were distinguished for their supremacy in certain athletic events have died young. But the number of young men who are now practicing athletic exercises in this country and appearing in public contests is very large, as many as six or seven hundred entries being recorded in some of the great city meetings. Where

the yearly mortality in most of our towns and cities is about twenty to every one thousand inhabitants, it is natural that in this athletic age the name of some young man who had practiced athletics should be among that fatal number. It would be unwise to infer that his death was caused by athletics unless his condition previous to entering athletic contests and the life he had led during his so-called athletic career were known. One regrets to add that a great many of the physical breakdowns which are attributed to athletics have their origin in irregular, and in some cases dissolute, habits of living.

Every man who rises to eminence in his trade or profession must necessarily undergo more than the ordinary mental and physical strain of life. Notwithstanding this fact, some of the foremost men of the world have exceeded the allotted period of threescore years and ten. Perhaps their long lives was the important factor that contributed to their eminence. Some of these men have been noted for their great athletic vigor as well as their intellectual achievements. Such men were Brougham, Lyndhurst, Peel, Campbell, Graham, and Palmerston, of England. Sir Walter Scott, Professor John Wilson, and Robert Burns, of Scotland, were also distinguished for their athletic abilities. So were

Gladstone and Bismarck of recent time. And for illustrations nearer home, reference may be made to the poet Bryant, who used his dumb-bells daily up to the time of his death, though he lived to be eighty-four, and to the historian Parkman, who was a good boxer while in college and kept up some form of physical exercise throughout his entire life.

This systematic practice of physical exercise in advanced years is equally true of various prominent men among us at the present time. The leading essayist in America to-day, who is now verging on his eighty-third year, has always been fond of gymnastics and athletic sports, and took his daily swim in summer time until a few years ago. The president of one of our foremost universities, and a distinguished scientist and patron of education, both past seventy, were prominent oarsmen in college, and now have recourse to yachting and horseback riding to keep them in good working condition. An eminent naturalist, and one of the hardest-working men whom it is our pleasure to know, was a good all-round athlete in his younger days, though originally not of a strong constitution. Only a few years ago, while making a geological survey off the coast of Florida, he was capsized and remained in the water for several hours, swimming and clinging

to the boat. Although now more than sixty years of age, he is in regular attendance at the college gymnasium and takes his exercise energetically and systematically.

The effect of practicing violent forms of competitive exercise for a considerable period of one's life is commonly supposed to be injurious. No less an authority than Dr. Benjamin Ward Richardson says, in his *Diseases of Modern Life*, that "there is not in England a trained professional athlete of the age of thirty-five, who has been ten years at his calling, who is not disabled." One cannot help thinking, however, that his statement is an exaggeration. While it may be true that men beyond thirty-five years of age very rarely attain championships in any athletic contests, men who have attained great distinction as athletes frequently live and enjoy good health up to sixty, seventy, eighty, and even ninety years of age.

Henry Clasper, the English oarsman, rowed in one hundred and ten different races, most of them over four miles in length, and won several after he was forty-seven. James Taylor, another excellent oarsman of England, rowed in one hundred and twelve different races. William Belden, the Nestor of cricket, lived to be over ninety-six. John Bowyer, another famous cricketer, lived to be over

ninety. Jem Ward, the English pugilist, died at ninety-five, and Jem Mace, at one time the English champion, when over eighty was teaching sparring. Blondin, the French gymnast who crossed Niagara on the tight rope in 1855, 1859, and 1860, died at seventy-two years of age. Many of the distinguished circus performers in England lived to be well along in old age. Among these were the great Astley, who died at seventy-two; Pablo Fanque, at seventy-five; Madam Saqui, at eighty; and Saunders, at ninety-two. In our own country many of the old circus performers have been long-lived. Perhaps one of the most distinguished was Eaton Stone, the once famous bareback rider, who lived to be over eighty.

Many professional athletes and instructors in physical exercises can be recalled who have certainly been subjected at times during their lives to great physical strain. Among this number may be mentioned William Wood, of New York City, who was over eighty at the time of his death; Professor Andrews, of Brooklyn, who at sixty-seven is still teaching gymnastics; George Goldie, of Princeton College, who, although sixty-four years old, is even now engaged in teaching and performing heavy gymnastics; and John Wood, of New York, who did not give up his gymnasium until over seventy-one.

Among amateur athletes who lived beyond middle life may be mentioned William B. Curtis, of New York. Mr. Curtis probably engaged in a wider range of athletic exercises and kept in practice a longer term of years than any other man in America. For this reason he was frequently referred to by the younger generation as the "father of athletics." Notwithstanding his violent physical efforts in earlier years, he was able, when over sixty years of age, to accomplish a large amount of intellectual work, and still enjoy vigorous exercise in walking, swimming, and skating. In one or two cases we have known of men actually acquiring an increase of physical vigor and physical measurements after the age of sixty by the practice of systematic exercises. Mr. Smith Robertson, of Eau Claire, Wisconsin, a man five feet eight inches in height, and weighing one hundred and forty pounds, began systematic exercise with ten-pound dumb-bells and a horizontal bar when sixty-nine years of age. He worked with this apparatus for about ten minutes a day, and walked from four to six miles a day regularly for a period of three years. At the end of this time he found that his weight had increased from one hundred and forty to one hundred and sixty pounds, his chest measurement

had increased from thirty-six to forty inches, and all the other muscles of the body proportionately; and at eighty-three years of age he could walk or run almost as easily, and with apparently the same elasticity, as fifty or sixty years before.

Upon reviewing the lives of these prominent athletes and gymnasts, many of whom have been known to us personally, the facts that most forcibly impress one are the wide range of exercises in which they have engaged, and the sensible way in which they have taken care of themselves, even under unfavorable conditions.

From these observations we think it may be fairly concluded that violent physical efforts are not incompatible with the attainment of a comparatively long life, provided the individual has a sound constitution to start with, and that he both strengthens his whole system by the practice of a variety of exercises and gives careful attention to his habits of living. Nevertheless, as few persons are endowed with the constitutions from which athletes are made, it would be a safe rule for most persons to refrain from violent physical efforts if they value their health and desire longevity. The body as a whole is no stronger than its weakest part, and when a person is subjected to a severe strain, it is the weak

spot that is likely to cause trouble. Instead of working under high pressure for a short time, much more can be accomplished, and with less risk to health, by working under a low pressure for a longer time. In our opinion the chief requisites are that the working conditions be as favorable as possible, and that the efforts be sufficiently varied to bring all of the bodily functions into action : oft-repeated efforts of mind and body, and frequent intervals of rest.

> By ceaseless action all that is subsists.
> Constant rotation of the unwearied wheel
> That Nature rides upon, maintains her wealth,
> Her beauty, her fertility. She dreads
> An instant's pause, and lives but while she moves.

According to our premises there is no way in which the individual parts of the organism can be properly nourished and sustained except by activity, and upon the health and tone of the individual units depend the health, strength, and endurance of the body as a whole.

CHAPTER IV

AIMS, MEANS, AND METHODS OF PHYSICAL TRAINING

For the proper understanding of any authoritative system of physical training, it is necessary at the outset to have a clear conception of the aims in view, the means to be used, and the methods to be pursued. As at present understood, the aims of physical training may be included under four general heads: hygienic, educative, recreative, and remedial. The hygienic aims of physical training are placed first, for the topics included under the head of hygiene must necessarily influence all other aims and motives. Thus it would be difficult to conceive how any system of physical training could be truly educative, recreative, or remedial which was not also hygienic.

The aims of physical training from a hygienic point of view embrace a consideration of the normal proportions of the individual, in order to determine normal growth and development; a consideration of the anatomical structure of the body and the

physiological functions of its various organs; and a study of the ordinary agents of health such as exercise, diet, sleep, air, bathing, and clothing. Incidentally the questions of climate, occupation, nurture, history, temperament, and inheritance of the individual must also be studied in order to know what course to prescribe for him. It is the business of the physician and the physical director, and even of the teacher, to know the range of these modifiable agents and conditions, and in what way to employ them towards the maintenance of health and the prolongation of life. Thus, exercise which is appropriate for one person, sex, or age, would not be appropriate for another; and a perfect system of physical exercise might be neutralized in its results by a poor diet, insufficient sleep, scanty clothing, bad air, or injudicious bathing. Where it is possible to do so, — and this cannot be reiterated too often, — each individual should not only have a physical examination, with the appropriate measurements and tests, but these examinations should be followed up by judicious inquiries into personal habits of living and working, in order to discover the contributing causes of the physical condition presented. In this way the director will be enabled to prescribe a course of training for him, and to give such advice

as to exercise, diet, sleep, and bathing as is best calculated to promote vigorous health and to secure physical perfection.

Educative physical training aims to cultivate those special powers of mind and body which are generally engaged in the acquirement of some skillful trade or physical accomplishment. Swimming, skating, fencing, boxing, bicycling, tennis, golf, billiards, and dancing are educational. Likewise many feats on heavy gymnastic apparatus, and all forms of balancing, juggling, and tumbling are illustrations of exercises which are educative in their effects. Most of these exercises involve the training of the special senses, and the brain and central nervous system, as well as the muscular system. Where the educative aims are pushed too far and the hygienic aims are neglected, the individual draws heavily upon the same supply of nerve force which sustains him in his mental pursuits, and by thus burning the candle at both ends is likely to break down from nervous exhaustion. Students and professional men often complain that the strain of attention required of them in training for fencing and similar contests is so great that it unfits them for hours for any other mental work. For similar reasons the same class of patrons often object to formal gymnastics and

complex drills. The aim in every case should be to maintain a proper balance between the mental and physical forces; and this should be the object in view in practicing recreative exercises.

The prominent part which so-called recreative games are now playing in our systems of physical training leads us to ask just what recreation really is. Etymologically considered, the word "creation" means *a forming*, and "re-creation" means *forming anew*. When applied to the body, the word "recreation" means simply a renovation of the vital energies. Therefore recreation is, or ought to be, not a pastime entered upon for the sake of the pleasure which it affords, but an act of duty undertaken for the sake of the subsequent power which it generates and the subsequent profit which it insures. Recreation may be defined as that which, with the least expenditure of time, renders the exhausted energies best fitted to resume their work.[1] Most games are played for the fun, or enjoyment, or recuperative power there is supposed to be in them; but if they are played so long and hard as to become exhausting, they are certainly not recreative. The absurdity of this claim may be

[1] "Science and Philosophy of Recreation," by George J. Romanes, in *Popular Science Monthly*, October, 1879.

realized when it is known that football players are not infrequently obliged to leave college temporarily to recuperate from the effects of their recreation. The primary aim in every recreative exercise should be to secure a frequent change of organic activity, not only such as is realized in going from work to play, but even a frequent change in the kind and variety of play. The criterion of success in all cases is the vigor with which the individual returns to his daily work, and the ease with which he accomplishes it measures in a practical way the value of his recreation.

The remedial aims of physical training are usually comprehended in the efforts to restore disturbed functions and correct physical defects and deformities. The former efforts are usually termed "medical gymnastics" and the latter "corrective gymnastics." By medical gymnastics attempts are made to treat such diseases as anæmia, asthma, jaundice, sclerosis, neuralgia, obesity, pleurisy, hysteria, and many others. In corrective gymnastics, as the term implies, efforts are made to counteract the drooping head, round shoulders, flat chest, hollow back, sloping shoulders, curved spine, and other acquired defects of form and carriage. To improve the functional capacity of the important organs, to

increase the general nutrition of the whole body, to correct deformities, and to elevate the individual to a higher plane of living are the chief remedial aims of physical training.

The means employed for effecting these different aims are many and various, but they may be summarized under the following general heads: (1) free exercises (without apparatus); (2) gymnastics; (3) athletic sports; (4) plays and games; (5) developing appliances, or the so-called medical gymnastics.

Under the above head of free exercises may be classed all those which are performed without any apparatus. The milder forms of these exercises are those termed "devitalizing or relaxing movements," calisthenics or æsthetic movements; and the severer forms are the Swedish free movements, various forms of dancing, and dancing calisthenics.

Gymnastics as now practiced may be divided into two groups, — light gymnastics and heavy gymnastics. Under the head of light gymnastics are included such exercises as are performed with light pieces of portable apparatus, which can be held in the hands and moved around the body, such as dumb-bells, Indian clubs, wands, hand rings, and balls. Heavy gymnastics usually include such exercises as are

performed upon fixed or heavy appliances, where the weight of the body is supported and made to move or revolve about the apparatus by aid of the hands or legs. The appliances of this kind are known as horizontal and parallel bars, ladders, vaulting horses, suspended ropes, poles, rings, and trapeze bars.

The exercises which are now classified under the head of athletic sports comprise those which are peculiar to the race course or running track, and those which are performed in the open field. In the former are included the various events in running, hurdling, and bicycling, and in the latter such exercises as jumping, pole vaulting, and weight throwing. If we bring under the head of athletics all of the competitive exercises presided over by the Athletic Union, the list should be made to include boxing, wrestling, fencing, swimming, skating, etc.

In the popular mind baseball, football, and rowing are included under the general term "athletics," but for educational purposes it is better to group baseball and football with cricket, tennis, golf, and lacrosse, under the head of games. As these games are played at the present time, however, they are games of skill which presuppose serious work or hard and careful preparatory training. There is an

element wanting, especially for children or hard-worked students, that is found in another class of games which may be well termed "plays." The plays include the different forms of tag, with which we are all familiar, the impromptu races and contests of one kind or another, and the gymnastic games, which the intelligent instructor knows how to sandwich in between the different periods of routine work to relieve the set exercises of their monotony or to dispel the gloom that usually accompanies a dark, stormy day. The games of basketball, battle-ball, three deep, pin polo, over the line, pass-ball, and a variety of others were invented to serve this purpose. One of the first essentials of such games is that they shall appear to the pupil to be spontaneous, though all of the details must be carefully arranged beforehand by the instructor.

The developing appliances with which most gymnasiums are now so well equipped consist of chest-weights, chest expanders and developers, quarter circles, inclined planes, and rowing machines to the number of fifty or more. The Zander machines, which are largely used in hospitals and sanitariums, constitute the outfit which is used most frequently in administrating the so-called medical gymnastics. Many of these appliances are attached by belts to

the fly wheel of a steam engine, and all that the patient has to do is to seat himself at the apparatus and the engine does the rest. By communicating to the system a succession of quick vibrations or oscillations, rapid tissue changes are produced, and the vital organs are often stimulated to greater activity. In order that the various agencies employed in physical training shall produce the desired effects, they must be used judiciously and with some knowledge as to their general and specific application to different individuals at different times and under different conditions of life. This introduces us at once to a very difficult subject, concerning which there is a great variety of opinion but very little positive knowledge. That an exercise may agree with one person and not with another is a matter of common observation, but the reason is not always readily understood. Without going deeply into the physiology of the subject, we may safely settle upon certain general principles that will guide us in making an intelligent selection of exercises.

As a general rule, in all exercises the qualities first required are the qualities at length developed. If the exercises require quickness, quickness will be the result; if they tax the strength, increased strength will follow; if they require endurance, improvement

in this direction will come with practice. Thus exercises could be divided into those tending to give general strength, like the handling of heavy weights, as in hammer throwing and shot putting; those tending to give local strength, as exercises with chest-weights, dumb-bells, Indian clubs, and exercises on the heavy gymnastic apparatus; those tending to give quickness, as running, jumping, and lawn tennis; those requiring a high degree of skill, as balancing, advanced work with the Indian clubs, and the different feats of juggling; those requiring alertness, such as boxing, fencing, wrestling, and baseball; those tending to increase the power of endurance, as distance running, rowing, swimming, and mountain climbing; those requiring attention and varied responses to commands, as Swedish gymnastics, military tactics, and many calisthenic drills; and those which tend to make one supple and graceful, as the different varieties of dancing and æsthetic movements, or to engender courage and daring, as in football and some of the forms of heavy gymnastics.

Many of these exercises, however, may be performed in such a way as to produce different effects from those named above, while certain ones may be made to realize nearly all of the results mentioned.

But all the exercises improve the organism and develop these different traits, qualities, and characteristics through their effect upon the muscles, lungs, heart, brain, and general nervous system. It is possible, therefore, to make such a selection of exercises as will greatly improve the physical condition of all these important parts of the body. Unfortunately the problem which most of us are called upon to solve is not what is best to give our pupils in order to accomplish certain results, but how to induce them to undertake physical training as they do other forms of school and college exercises. This brings us at once to the question of *method;* and to the consideration of the variety of topics growing out of the discussion of this part of our subject we shall devote the remainder of this chapter.

Shall the practice of physical exercise be left optional? Shall attendance at the gymnasium be required? Shall the physical work be made a part of the regular school or college curriculum? These are some of the questions which seriously concern those who are searching for the best methods of meeting the demands of the age for physical training. Where physical exercise is left optional, those who most need it do not take enough of it, while

those who are not especially in need of it are apt to devote more time to it than is necessary or consistent with the performance of other school or college duties.

The attractions which are often put forward to persuade and allure the young to take systematic exercise do not always commend themselves to the best educators ; and unless they are carefully regulated and controlled they tend not only to injure the participant but also to destroy the game or exercise itself. The old-fashioned gymnastic exhibition and the boxing and wrestling contests, once so popular, have gone through this stage of evolution, and football as now played is rapidly approaching the danger point that marks the beginning of its decline. On the other hand, where attendance upon physical exercises is required and no credit given for the kind, nature, and amount of the work done, the students are likely to enter into the exercises with a half-hearted spirit, and comparatively little good is accomplished. The efforts that are now being made to introduce physical exercises into the public schools are not meeting with the success that they should, simply because they are usually directed in a perfunctory sort of way, and there is no moral or physical enthusiasm behind them. The plan

recently adopted in Boston — of holding the teachers responsible for the physical work done in their schoolrooms and regulating their promotion accordingly — and the plan adopted by some of the school boards of England — of cutting down the appropriation of those schools that do not show good physical results — are likely to have a stimulating influence on the teachers and to bring them to a realizing sense of the dignity and importance of the physical work.

The lack of interest and the apparent apathy of most teachers in regard to physical training is not to be wondered at when we consider the attitude of our colleges and universities in regard to this great subject. The history of education shows us conclusively that nearly all the radical changes and great movements of reform in education have been started in the colleges and then worked down through the secondary schools. In regard to physical education, however, it would almost seem as though this general rule had been reversed. The popular furor in regard to athletics has lent a false coloring to the whole subject of physical training, and has influenced many of our higher institutions of learning to adopt measures and pursue a policy detrimental to the best interests of physical education. But

athletics, as we have already shown, are desirable adjuncts in developing the body and in training the mind and character. The question here is, What method or policy shall we pursue in managing them so as to preserve the good and reduce the evil to a minimum?

Before attempting to answer this question we wish to consider some of the peculiar phases and tendencies of the movement as it reciprocally affects the college and the community at large. Nearly all the colleges and universities at the present time make some provision for the practice of athletic sports. The special advantages that different institutions offer in this direction are set forth in their annual catalogues and reports, and the loyal graduates never weary in their efforts to keep up the athletic interests of their alma mater. There is an impression abroad that a sound mind in a sound body is a desirable possession, and in the opinion of many the best way to attain this end is by the practice of physical exercises. The liberal sums of money donated to build and equip gymnasiums, purchase athletic fields, and sustain athletic sports are given largely by persons who think they are contributing to the physical welfare of the rising generation. And among the multitude who attend

the great games it is fair to presume that there are many thousands who lend their presence to the occasion partly in view of helping the cause and encouraging their own offspring in the practice of manly sports. When Harvard and Yale send out their athletic teams to compete in football, baseball, or boating, the presumption is that these teams represent in some measure what these great universities are doing for the physical training of their youth.

There would seem to be no other reason for allowing and encouraging students to participate in public athletic contests, although a large proportion of the community hold different views on the subject. Some years ago, when the writer was a member of Harvard's committee on the regulation of athletics, the game of football had become so rough and vicious that the committee found it necessary to recommend that the Harvard team be forbidden to play until the rules of the game could be so amended as to do away with certain bad features. Among the many letters that came flowing in upon the committee at that time were a few of a congratulatory nature and some of positive condemnation; but most of them were written rather in sorrow than in anger, not that the boys were to be deprived of their customary sport, but because the authors were

to be deprived of their customary amusement and Thanksgiving spectacle.

If eight, nine, or eleven men come to a college from different parts of the country and are selected on account of their fine athletic powers and natural abilities to row, run, or play ball, they will excel in these exercises just in proportion to the time they devote to them, the kind and amount of instruction they receive, and the facilities they have for practicing them. But how do the public exhibitions of a boat crew or ball team benefit a college or university? Simply by way of advertisement. Some fond mother or devoted father will see or read about these fine, large, manly fellows practicing their athletics, and immediately conclude that the college that can send out such specimens of physical manhood is the college for their boys to attend.

The wear and tear of business and professional life, the dissipations of modern society, and the luxurious habits that follow the accumulation of wealth make sad havoc with the physical stamina of both old and young. The cry of the multitude is for more health, strength, and endurance. Parents wish their children to have good bodies and to be vigorous and strong. Every private school, seminary, and college in the land is made to feel this demand

for a better care of the body, that is radiating from the home circle, and hundreds of institutions are responding nobly by improving the sanitary conditions of their buildings and adding gymnasiums and other facilities for practicing physical exercises.

The weakness of this popular movement to-day is the undue prominence that is given to the sporting and spectacular side of athletics, and the almost entire absence in practice of the educational features of these valuable exercises. Under the influence of the present tendency the college is not so well adapted for developing athletic qualities as it is for exhibiting them. What the coaches and captains of the university teams are searching for is not the weak whom they wish to make strong, not the timid and nervous whom they wish to make more courageous, but the men who have the best natural endowment of nerve, muscle, and endurance that can be found, in order that they may be able to run, row, or play ball well enough to beat their foremost rivals. In college, as in the world at large, natural athletes are rare, and the really strong men are in the minority. At Harvard University about one hundred men out of four thousand are in condition to participate in the final athletic contests; yet it requires the combined services of some fifty men

and an expenditure of over $50,000 to take these picked athletes through the season's training. The athletic management at Yale expends an equal amount to bring their teams up to championship form by the end of the season. In other words, our two largest universities expend a hundred thousand dollars a year, and one hundred persons devote a great deal of time and energy, in order to exhibit the skill, strength, and endurance of two hundred or more selected men who entered college with good physiques, and who could easily have dispensed with so much physical training.

But here we are aware that we shall be met with the assertion that students as a class do not engage in athletics for their health or for their mental or physical improvement. If this be true, it is very much to be regretted; for when these exercises are chosen wisely and are practiced rationally, there is no better means of maintaining health and adding to one's constitutional vigor and vital capacity. One cannot help thinking that a large number of students come to college with the hope that they are going to get some benefit from this much-talked-about, much-written-about, and much-abused method of training. Let us see, therefore, what is done in our colleges for the ninety-seven per cent that

never appear in athletic contests. For this purpose we shall confine our observations to Harvard University for a typical illustration.

In consequence of the popular enthusiasm and the wide public interest in athletics, a large number of young men upon entering college are filled with the ambition to become athletes and get on the university athletic teams. In many cases the zeal of these young men is greatly in excess of their abilities, and in their efforts to get into university form and keep pace with the stars, they often do themselves injury. In football especially a great deal of raw material is used as a temporary battering-ram, or made to furnish a wall of temporary resistance to develop the defensive or attacking power of the more stalwart rushers. The coaches cannot afford to use their time and energy in developing men, for their business is to develop football players; so they are anxious to weed out the weak ones, that they may give their undivided attention to the most promising candidates.

In order to protect the weak and feeble from their own folly and rashness in entering as competitors into violent athletic contests, students at Harvard are required to pass a rigid physical examination, during which they must not only show

themselves to be free from any functional or organic defect, but they must also prove to the satisfaction of the authorities that they have sufficient strength to stand quite a severe nervous and muscular strain. The fitness of the candidate to enter the university athletic teams in football and rowing is determined by his ability to lift a weight, equivalent to about four hundred pounds, with the back bent and the legs and arms straight; to lift a weight equivalent to five hundred pounds with the legs bent and back and arms straight; to close the hand on a resistance of at least one hundred pounds; to pull one's own weight up by the arms ten times while hanging from a pair of rings; to raise one's own weight ten times while supported between two parallel bars; and to show a lung capacity of above two hundred and seventy-five cubic inches. The tests for class teams and lighter forms of athletics are less severe, but all students who wish to enter the contests have to pass through this ordeal before they can receive their certificates of permission. This precautionary measure undoubtedly saves many students from injury and induces many more to take systematic exercise in view of gaining the necessary strength to pass the examinations.

There are in Harvard University at the present time some four hundred students who have made a strength test equal to or surpassing that required of the competing athletes. About this number spend one or two months of the year trying to qualify and obtain a position on the university or class teams. Failing in this attempt many relax their efforts in the practice of athletic sports and join the great throng that have athletic tastes, without athletic abilities, and henceforth take their exercise in walking to and from the athletic grounds to witness the exploits of their more fortunate comrades. Those who have weak constitutions or who are in need of special toning up will follow the prescribed exercises, or the voluntary class drills, with dumb-bells, Indian clubs, pulley weights, and other appliances of the gymnasium, until they have become a little monotonous and wearisome; then many will relax their regular efforts, and walk, ride, and drift about from one thing to another, as their fancy dictates. Those who are of scholarly inclinations as a class will take very little exercise for the sake of exercise. Their tastes and inclinations make physical efforts disagreeable, and often their only rest from study is a change to some other form of mental pursuit. A few in this class really

accumulate something in the way of physical vigor, but many more make heavy draughts upon their original stock of vitality and enter their life work with a very small amount of reserve power.

Quite a large and increasing number of students of well-balanced minds and methodical habits of living, who would be ranked neither as scholars nor as athletes, though their mental and physical endowments would enable them to excel as either, follow a regular, systematic course of gymnastics and athletics. Their aim is to maintain a vigorous state of health and improve their physical condition. They walk, run, row, skate, swim, play all the games in their season, and supplement the deficiencies of their favorite sports by the exercises of the gymnasium. In fact, anything that promises to add to their physical capital and better prepare them for their life work is gratefully accepted and practiced with earnestness and enthusiasm.

It has been the aim of the author to try to make physical exercise for its own sake fashionable. As evidence that the students of Harvard University intend to take exercise of some sort for some purpose, it may be stated that about two thousand out of four thousand make use of the gymnasium more or less every year. In addition to this number,

there are many who walk, run, row, fence, spar, ride bicycles, play tennis and baseball, and practice other forms of sport, who seldom go to the gymnasium. It is only fair to state that the attendance at the gymnasium greatly surpasses that upon any one of the literary courses, but it is much less than half the attendance upon the four or five (out of four hundred) courses that all students are required to take in order to obtain a degree.

Now only three men are employed at Harvard to look after the physical instruction of the two thousand that attend the gymnasium, and the cost of maintaining this institution, including salaries, is less than twelve thousand dollars annually. If the reader will compare this statement with the one on page 82 in regard to the number of coaches or instructors who look after the welfare of the few athletes who take part in the public contests, and the amount of money that is expended in maintaining the system, he will readily see that there is a considerable inequality. To be sure, the money expended upon the athletic teams is contributed by the students and their friends, and by the public who pay to see the great games, while the college pays for the support of the gymnasium; but when it is considered that nearly a thousand dollars per

man is expended yearly upon the training of naturally vigorous athletes in order that they may be put in condition to make a "Roman holiday," while only four dollars per man is expended yearly upon the physical training of the young men who are being prepared for the hard, grinding duties of professional life and responsible citizenship which may well be termed a perpetual contest, there would seem to be a radical lack of harmony between the realizable ideals of physical training and the actual results from the methods in use at our own great universities.

Under our present system the most that can be done for the students that really need physical training is largely of an advisory nature. The sense of duty which each man owes to his present and future well-being is the only incentive to keep up regular, systematic efforts toward physical improvement. Against this sense of duty all the forces around him seem contending. The most potent are the demands and exactions of the faculty, that the student shall maintain a certain standard of scholarship in order to remain in college; then there are numerous clubs and societies, literary and social, that draw heavily upon his time and attention; there is also that inevitable inertia, due to a sluggishness of the system, which exercise would remedy,

that makes it difficult to engage in action of any kind. As a consequence of these distractions or of this inertia, and because they miss the same incentives to hold them to their work, only a small portion of the two thousand men who enter the gymnasium pursue a regular, systematic course of exercise which compares with that which they take in the literary departments. All practical educators admit, however, in theory at least, the dynamic relation between good digestion, circulation, and respiration, and the ability to make a life's labor of mercantile, professional, or highly intellectual pursuits. The opinion is fast gaining ground that the progress of the world is not due so much to men of talent and genius as to the well-organized, finely balanced men of ordinary abilities who can stay at their posts of duty when their more brilliant competitors have wearied of well-doing, sickened of their surroundings, or dropped out of the race. Man's ability to do physical or intellectual work depends upon his power to generate force; that is, to convert food, water, and air into organic faculty, then into effective energy. Whenever a man rises to preëminence in any walk of life, it is because of this generating power. In this respect man is like a locomotive engine. In his anxiety to gain time

and to "get there," the engineer may forget all about the condition of his feed pump, boiler, and driving wheels, until some part ceases to perform its function, or entirely gives out, when the engine is no longer fit for service and is pulled off for repairs.

This question of physical fitness, of being able to keep in condition for work or for pleasure and enjoyment, is a matter that has not sufficiently engaged the attention of our American people. Our English cousins, as a nation, greatly surpass us in this respect. This is especially true of the great men who have taken a prominent part in shaping England's history. Peel, Brougham, Lyndhurst, Campbell, Bright, Gladstone, — nearly all the great political and legal leaders, the prodigious workers at the bar and in the Commons, — have not only been men of fine physique, but they have been as sedulous in training their bodies as in training their intellects. The stories of Gladstone's keeping up his regular physical exercise, even in his old age, are familiar to every schoolboy, and we all know the fondness of the proverbial Englishman for his cricket, rowing, riding, hunting, mountain climbing, etc. At the great English schools — Rugby, Eton, and Harrow — athletics of some kind are a part of

the daily routine, and when the boys go up to the universities they take to the practice of their sports as a matter of course.

When our boys come to college prepared in body as well as in mind for their college work, when they are imbued with the idea that good health is necessary for success in life, and that a strong heart, capacious lungs, and a good stomach are the essential requisites of a sound, energetic brain, — the care of their physical well-being may be safely left to their discretion. But our boys do not come to college imbued with any such ideas. It has been my province for the past thirty odd years to stand where I have met this stream of youth in the natural state as they come from the school to the college, and the composite picture that is indelibly stamped upon my brain is not that of a Hercules, or of a gladiator, or even of an Apollo. A few years ago we had the average measurements of the student class as they entered college embodied in a statue that was on exhibition at the World's Fair at Chicago. Many persons supposed that the statue was intended to represent an ideal figure, and recalling to their minds the classic statues of ancient Greece and Rome, they thought that the figure of the typical student was woefully lacking in its

muscle measurements, though it represented a man five feet eight inches in stature and weighing about one hundred and forty pounds. When I tell my readers that as small as this figure may seem to them, the physical measurements of one half of the students in our colleges to-day are less than those of the statue of the "typical student," they will perhaps be prepared to believe that brain is *not* being sacrificed to brawn to any considerable extent in our American institutions of learning.

Our schools and colleges have unfortunately allowed the athletic movement to get a decided bias in the wrong direction. They have nursed and fostered its spectacular side, while they have entirely ignored its hygienic and educational aspect. They have encouraged the athletes to represent the physical side of college life, and the scholars to represent the intellectual side. In other words, they have fostered the highest degree of scholarship and extreme athleticism. Both attainments are incompatible in the same individual, therefore the scholars and athletes are contending for fame in opposite directions. One class hopes to win honor and distinction by the supreme efforts of the mind, and the other class by the supreme efforts of the body. In our opinion both classes are injuring the cause

of education in its best, noblest, and broadest sense. The scholars will be likely to fail in life for the want of some of the qualities of the athletes, while the athletes will sadly lack many of the attributes of the scholars.

Would it not be a wise plan to return to the old Greek idea of unity in education, and recognize the rational claims of both body and mind, and train them together? We do not know any other way of accomplishing this desired result than by making physical exercises a part of the regular college curriculum, and by putting them on exactly the same footing as any other department of education. In order to calm the fears of those who think the cause of true learning would be injured by such an innovation, it may be said that most of the colleges in New England have already added required exercises in the gymnasium to the regular curriculum; and from the fact that we hear so little about athletic excesses in these institutions, some favorable inferences might be drawn.

If five per cent of the students in our largest universities can carry their athletics to excess and still do intellectual work enough to entitle them to a degree, it is hardly just to infer that the remaining ninety-five per cent would be less likely

to attain as high a standard of scholarship if they were encouraged to take physical exercise enough to keep them in good working condition.

While teaching gymnastics at Yale University some years ago, the students came to me in divisions that were graded according to scholarship. In my four years' experience at that institution I never knew an instance when the first division in scholarship was not also the first division in gymnastics. I may add that this excellence was not due so much to their superior physiques as to their superior *morale.* The work was to be done and they did it. So I believe that it is the scholarly men in any college who would be most benefited by systematic physical exercise if made a part of the regular curriculum. It would seem that this class is the one that our colleges are the most anxious to conserve, and the one that should really represent the conditions prevailing at a scholastic institution.

When scholarship men are encouraged to cultivate the body as an aid, and not to consider it a hindrance to the development of the brain, and when the majority of our students take physical exercise enough to show some signs of permanent physical improvement, it will do, perhaps, to think of the possibilities of our colleges giving too much

attention to the training of the body. Until that time shall come it is the duty of all persons interested in the welfare of our college youth to use their influence in staying the tide of concentrated athleticism, and in trying to give to the physical training of the mass of students who need it some part of the time and attention now given to the physical training of the favored few.

Again it must be maintained that the only method that will enable us to accomplish this desired result is by placing mental and physical exercises on the same plane, and by rewarding every honest and faithful attempt toward physical improvement with the same recognition that we bestow upon the efforts to improve the mind.

CHAPTER V

PHYSICAL EDUCATION IN COLLEGES

To those who are familiar with the subject, it has long been evident that there exists in the public mind a widespread misapprehension as to the amount and the system of physical training in American colleges. The tone of current newspaper comment, often humorously intended, to be sure, is nevertheless misleading to readers whom it unconsciously influences. Athletics, gymnastics, and aquatics are not the chief subjects of college instruction, as certain editors would have us believe, and as a certain proportion of otherwise intelligent people seem really to suppose. And in the present chapter we desire, as briefly as possible, to correct this mistaken notion and to call the attention of educators to the urgent need of some system of physical exercise in our higher institutions of learning.

During recent years the science of physiology and hygiene has made rapid advancement. The elementary laws of health have been more widely diffused and more intelligently followed by the

people at large. The medical profession is trusting less to drugs and more to natural agents. Air, food, sleep, and exercise, when properly administered, are great remedies as well as great preventives of disease, and doctor and patient alike are beginning to realize this fact. Our houses are better ventilated, our tables more healthfully provided, our time for sleep is lengthened, outdoor games are becoming popular, and our styles of dress have been perceptibly modified in favor of health and comfort. This spirit of the age is recognized by the governing bodies of our colleges and seminaries, who announce in the catalogues of their institutions that due attention is given to health and physical training. Parents are attracted by these announcements, and send their sons and daughters to college in the confident hope that they will receive physical as well as mental training and development. But their expectations are seldom realized. The intelligent system of physical culture which they thought to find exists only in the imaginations of the trustees and faculty.[1]

It is true that nearly all the larger seminaries and colleges in the New England and Middle states are provided with gymnasiums, or their students

[1] This chapter was written in 1883, but the same conditions prevail in many of the smaller schools and colleges at the present time.

have access to some place for practicing physical exercises. In a few of these institutions light gymnastics are made a part of the curriculum and are conducted under the eye of a capable instructor. The apparatus used consists of wooden dumb-bells, wooden wands, and Indian clubs, which vary in weight from one to four pounds each. The movements are arranged in a progressive series, and are designed to call into gentle activity all the muscles of the body. The time allotted to these exercises varies from one to two hours a week, and extends over a period of from three to eight months. In some cases regular attendance is required for the first year only; in others it is kept up throughout the school or college course. The maximum of required gymnasium work in any institution is not over two hours a week, and in one instance it is but one hour a week for a single term. No one acquainted with the structure of the human frame, or knowing anything of its natural requirements, will undertake to say that a half hour devoted to muscular exercise four times a week is excessive, especially when the apparatus used is of the lightest description. Yet this is all that is provided in the way of physical culture by the corporations in the best of our literary institutions.

Now what does the student do for himself? This depends partly upon his temperament and disposition and partly upon his surroundings. If he is strong and robust, overflowing with life and vigor, he takes naturally to outdoor sports; if he is of a studious turn of mind, or of a phlegmatic or melancholic temperament, he is less inclined to active exercise and falls more readily into sedentary habits. These inherited tendencies are sufficiently strong, we think, to warrant us in grouping college students in four great classes, — the athletes, the sporting men, the scholars, and the idlers.

The class of athletes is made up of those who give most of their time and energy to boating, baseball, football, and general gymnastics. Those who take part in these sports are chosen on account of their peculiar fitness for the position to be filled. A candidate for the university crew must possess at the outset a large and vigorous frame, must be especially strong in the back, loins, and legs, and must have great powers of endurance. These qualifications, we say, must be possessed at the outset, or a man cannot hope for a place in a college or a class crew, and outside of these crews very little rowing is done by individual students. The improvement in the art of rowing has shut out the majority from

participation in this sport. If they own boats, well and good: they can row when they like and as long as they like; but unfortunately this luxury can be enjoyed only by the few. Moreover, other obstacles, such as rough water, rainy weather, low tides, obstructions in the river and its distance from college, combine to render this sport impracticable and unreliable as the sole agent in any system of physical culture. Even where every provision is made to render this exercise accessible and attractive, only a very small percentage of the students avail themselves of it. At Harvard, Yale, Columbia, and Cornell less than five per cent of the students row regularly, and in the smaller colleges we find that unless a regatta is anticipated the boathouse is seldom opened at all. A few years ago several of these smaller institutions sent representative crews to Springfield and Saratoga. The money raised to defray the expenses of these crews was subscribed with the idea of awakening a general interest in boating, whereas it benefited only those who underwent the training, and was of personal interest only to those who "made" the crew. And when we look over the ground to-day we find that the only men who are enjoying the advantages of boating are the men who do not need them.

These remarks in regard to the boating men are almost equally true of the ball players. The game has been reduced to a science, and only one who possesses the necessary skill and experience can hope to belong to the nine. In most cases this skill is acquired long before entering college, and the tendency thenceforward is to develop to the extreme the abilities that have already displayed themselves. From two to three hours' daily practice in the field and a winter's work in the gymnasium is necessary to maintain the standard of excellence now required of college players. This is more time than is needed to keep the body in good working condition, and more than the mass of students can spare. Hence to the majority the advantages of baseball are practically denied. Only eighteen men can play at a time, and two regular nines are all that the largest of our colleges maintain. The game, therefore, is limited to a class of experts, and only those who are members of the nine get the benefit of systematic training.

The game of football opens a somewhat wider field. More men are required, the rules are easily mastered, and the qualifications demanded are more generally possessed. One should be sound and healthy in heart and lungs, and able to stand thumping and bumping for an hour or two with impunity.

If to this hardiness are added a fleet foot, strong limbs, quick perception, and presence of mind, one has the requisites of a football player. But even in this game as now played skill is of the highest importance, so that here again we see the same tendency to raise the standard of the sport and to narrow participation to the capacity of the few. Moreover, there are serious objections to football, which we have not the space to discuss here. It is a rough-and-tumble contest from beginning to end: bruises, strains, or internal injuries are its natural accompaniments. Of all college games this is the most accessible, and yet for the average and untrained student it is unquestionably the most dangerous.

The athletic contests, or "field days," of spring and fall open a still wider field for physical achievements. The exercises comprise running, jumping, walking, putting the shot, throwing the hammer, and similar sports. These contests afford an excellent chance for the specialist to display his abilities, and only specialists enter them. In the case of the specialist the entire energy of the system has been concentrated upon the development of special powers, and everything else is set aside as useless. This is the great objection to athletic exercises as they are conducted at present.

The gymnasts as a separate class have of late years been rapidly diminishing in numbers. Outdoor sports have grown in popularity, and the gymnasium is now used regularly and systematically chiefly by the boating men and the ball players as a means of keeping up their strength during the long winter months and of adding something to the skill required in their chosen sport.

We have thus seen that the whole system of college athletics is based upon a spirit of competition. Symmetry of development is never thought of, nor is it ever acquired by exclusive reliance upon any of our popular sports. Indeed, we would venture to select from any group of recognized athletes the oarsmen, the ball players, and the gymnasts, simply from their peculiar muscular development. In many cases these peculiarities are so marked that one can readily distinguish a starboard from a port oar, the pitcher, catcher, and shortstop from the rest of the nine, and can tell the piece of apparatus upon which a gymnast has won his distinction. To devote themselves wholly to some favorite sport, to make a "record" that shall be talked about by future classes, to become famous as oarsmen or pedestrians or ball players, — these are the ambitions of the men who are giving their time to such exercises. The tendency

of college students to-day is to look upon college athletics simply as a field for rivalry.

We have thus far been speaking of the men whom we termed collectively the "college athletes," but this class comprises only a small proportion of those who attend our literary institutions. There is a second class that we have called "sporting men." In what does their physical culture consist? Mainly in attending the races and games. If the river and the ball ground are at a distance, a tramp to either calls for a little exertion, but in the exercises themselves the sporting men never participate. "Tailorizing" is for them a more convenient method of making up for physical deficiencies. They do the betting and contribute largely to the financial support of the several athletic organizations, but they are never seen in the waist of a boat or on the floor of a gymnasium. From this class of men, however, often comes the best athletic material. Their spirit and buoyancy are indicative of a good natural heritage, and with these innate qualities for a basis a thorough system of training produces the most favorable results. It is just this kind of temperament that should find a legitimate channel for activity in systematic exercise. Whether this exercise be mental or physical, laborious effort of some sort should

be exacted daily. For this class perhaps the fatigue following physical effort is the most beneficial, as it is rarely accompanied by nervous irritability, and it sets at rest those vague, undefined longings which often supervene after severe mental application.

Still another class is composed of those men who attend strictly to the college requirements and who may be appropriately termed "the scholars." In this group are to be found the hardest intellectual workers, men who study almost incessantly during their waking hours, and among whom are some of the most highly organized and finely balanced students in college. It is needless to say that these men take no time for exercise or recreation. They never go to a boat race or a ball match, and the feats of the gymnasium are distasteful to them. A hurried walk into the country some Saturday afternoon, or a ride to the seashore, gives a little exhilaration; but physical effort of all kinds is irksome to a close student, and unless he is accompanied by an agreeable companion his mind is invariably brooding over some lesson or problem as he saunters along. Walking in this manner is merely taking an airing, and is no more beneficial than sitting by an open window. In the ranks of the scholars we find, however, a relatively small number who direct their

college course intelligently to the acquirement of symmetrical culture. Systematic habits of study are supplemented by systematic habits of exercise, and they would no more neglect one than the other. Such men are often called machine workers, but they are the ones who profit most by their exercise, because they take it regularly and make it subservient to their highest aims.

Of the idlers little need be said. They differ essentially from the classes we have considered, but chiefly in a negative way. They have no favorite pursuit, either intellectual or physical. They are surrounded by the stimulating influences of college life, but their inertia is seldom overcome, the golden days of youth are wasted, and the opportunities of mental and bodily training are carelessly thrown aside.

In enumerating these four great classes we have not attempted to deal with the exceptional cases. That there are many such cases in every college we are well aware. But our purpose has been to bring out the prevailing characteristics of each class as a body, to show the motives that prompt them to exertion, and to review their efforts in the direction of physical culture. To summarize, we may say that the athletes devote too much time to the

development of special powers, and sometimes carry their exercises to excess; that the sporting men rely upon their inheritance, physical and financial, and make no attempt to renew their capital; that the scholars as a class take too little exercise; and that the idlers take no exercise at all. When we consider the relative numbers in these several classes in all our colleges, it is safe to conclude that of the whole number of students not more than ten per cent give any attention whatever to physical exercise, and that less than six per cent take it systematically as a means of culture and development.[1] Surely, then, the charge that too much time is given to muscular education in our literary institutions has the slenderest possible foundation in the facts of the case. And it must be evident, too, that the members of college crews and ball nines are not in any proper sense representatives of the physical condition of the average students in their respective institutions.

The bane of American college life to-day is the spirit of prize getting which underlies and inspires the entire system. It is equally powerful in every

[1] The reader will understand that we are speaking of American colleges as a whole, and that the general interest in physical training among the students of Harvard, Yale, and some of our other larger Eastern institutions is exceptional and not representative.

department of education. It utterly destroys harmony of development. It unduly cultivates a student's powers in one direction, and dwarfs and stunts his growth in every other. The valedictorian has no time for exercise, or is too weary to take it; the champion athlete has no time for study, or is too stupid to begin it. One sits in his room with a wet towel about his head and conscientiously works out his allotted task; the other stretches himself upon a lounge and has the day's lesson poured into him by admiring comrades. Both are toiling for fame, though in opposite directions; both have won honors for their alma mater, so she gives them the same certificate of acquirements; and as to subsequent usefulness in the world, there is little to choose between them.

There needs to be a recognition of the supreme value of unity in education, of the harmonious cultivation of man's mental, moral, and physical nature. Now, we ask, if physical exercise is thought by our college faculties to be of so much importance that they permit and encourage a certain class of students to devote two, three, and four hours a day to body culture, often to the neglect of their studies, would it not be well to make some provision for those who are not athletically inclined but who are

more in need of exercise, and to whom, if judiciously applied, it would be of the greatest benefit? This is to be accomplished only by furnishing every preparatory school and every college with a well-equipped gymnasium, by making college sports a part of the regular curriculum, and by having them executed under the supervision of a competent instructor. By many institutions these requirements have been met in part; that is, one college is provided with a fine gymnasium, another has a good instructor, and a third has made its exercises obligatory. We know of but two or three institutions in the country where all these advantages are combined.

The gymnasium is, and has been since the days of ancient Greece, the great school of physical education. All its appliances were invented for that purpose. And as gymnasiums are used to-day, why are they not a success? Simply because they do not accomplish the object for which they were established: they fail to give every man who has access to them a complete and thorough physical training. But this is not the fault of the gymnasium in itself. Let us look at the building and the apparatus provided by some of our colleges, then at the manner of conducting the exercises, and then inquire as to the character and ability of the men

who have charge of the gymnastic department, and the principles upon which they are appointed. We shall doubtless find that the want of interest has not been wholly due to the obstinacy of students, but that the fault may be traced back, directly or indirectly, to the faculty or the boards of trustees and overseers.

A man gives forty or fifty thousand dollars for the erection of a gymnasium. The planning is handed over to an architect who has no idea of the kind of building required, but who feels it his duty to get up something that will at least be an ornament to the campus. He generally succeeds in doing this, and the donor and the corporation are satisfied. But what can be said of the structure as to its fitness for a temple of health? It is a building eighty feet long and half as many wide, poorly lighted, heated, and ventilated. The bathrooms are on one floor and the dressing rooms in the attic or cellar. The walls, roughly finished in brick or granite, are frescoed with dust in the summer and with frost in the winter. The floor is made of spruce and its seams are filled with gravel. In fact, incongruity and unfitness meet us on every side and in almost every detail. Why should this be so when the amount of money contributed is large enough to

meet all demands and the ground space allotted is ample? Because the architects and builders employed do not know the requirements of a good gymnasium and seldom seek the advice of those who have practiced gymnastics for years and have made a life study of the subject. The result is an edifice not adapted to the work for which it was designed. Exceptions should be made of the finely constructed gymnasiums at Harvard and Princeton; nor should we judge too sternly those institutions which have been obliged to remodel an old building in order to have any gymnasium at all.

Having put up a building, the authorities proceed to fill it with apparatus made by the college carpenter. This is arranged for the sake of appearance rather than for use. The material is selected without regard to fitness and is put together with little knowledge of its object or design. Hanging ropes are made of hemp and are stiffly tarred to make them durable. This object is effective, for they are never used twice by the same person. The parallel bars are broad at the base and narrow at the top, so as to render the grip insecure; and they are generally made of some splintering material, in order to remind the performer which way he is going. The trapeze is bolted to a beam in the highest part of the room

and left pendent twenty-five feet from the floor. Its bars are made of wood or iron, two inches in diameter, and that the novice may have every opportunity for losing his balance, holes are made in the ends of each bar and the ropes put through and tied with knots underneath. The rungs on the horizontal ladder are three quarters of an inch in diameter, and left rough, so that they may be firmly grasped, while in the vertical ladders they are smoothly polished. Both are carefully avoided, for in the first case every swing forward raises a blister, and in the second case every step upward is attended with positive danger. The sand bag weighs seventy-five pounds and is covered with the heaviest kind of canvas. One solid blow removes the skin from every knuckle and makes an impression that lasts a lifetime. This performance is never repeated. The mattresses weigh four hundred pounds each and are filled with excelsior or corn husks, which from constant rolling have become matted together in lumps. One would better land upon the floor than upon one of these cradle knolls, for the former only occasions a little tingling of the feet, while the latter invariably causes a sprained ankle. The weights are neither boxed in wood nor framed in iron but start from a trough filled with sawdust and dirt.

Every movement is accompanied by a cloud of dust and a deafening rattle and bang.

This is a fair representation of college gymnasiums throughout the country. They are built without intelligent plan, filled with heavy, cumbersome, and in many cases perilous apparatus, and then left open to the haphazard experiment of all who choose to try them. However good may be the intentions of self-improvement with which a student may enter a college, he is disheartened at the outset by such a gymnasium as this. He finds no appliances adapted to his need as a beginner and no provision for progressive development. Constant assistance and direction are offered him in every branch of college work save this: here he finds nothing worthy of the name of instruction. When we consider that two thirds of the students who enter college are not strong enough to use the heavy apparatus with pleasure or profit, the need of introductory apparatus becomes apparent. Wooden dumb-bells and Indian clubs do not meet this need. Something is demanded by which the biceps and triceps may be brought into alternate action, and the muscles of the back, loins, abdomen, and chest developed according to their requirements. If those desiring to use the heavy apparatus would prepare themselves for

it by bringing the required muscles into gentle action at first, and would then go step by step through a progressive series of exercises, they would not only find themselves increasing in power but they would also experience a certain satisfaction and acquire a discipline from the accomplishment of difficult maneuvers which no mechanical exertion can give. The apparatus which leads one gradually up to the beneficial use of the heavy appliances may be termed "adjustable weights and pulleys." These can be so arranged as to act upon any set of muscles and be adapted to any condition of strength or weakness. In order that they may be used wisely some one should be in attendance who has a thorough knowledge of animal mechanics and the action of the muscles, as well as a comprehensive idea of the structure and function of the various organs upon which vital action depends.

This brings us to a consideration of the men who are chosen to superintend the department of physical education. For every other branch of college instruction men of recognized ability are selected, and they are then required to maintain a certain standard of excellence. But in the department of physical culture the governing boards of our colleges have seen fit to make an exception. When

we find the gymnasium almost deserted there is a cause aside from poor apparatus and unattractive quarters. It is the lack of a suitable man, with sufficient authority, at the head of the department, —a man who is a college graduate, a practical gymnast, and an educated physician. Such a man, we say, must have sufficient authority, for unless he is supreme in his own department and can have the coöperation of the faculty he can do no better work than an inferior man with more freedom. Many instructors possess one or more of these qualifications: some are college graduates, others are educated physicians, and a few are practical gymnasts; but all the requirements are seldom found in the same person. This is only because there has been no demand for such men. So long as college boards look upon the position as one of minor importance and pay but a mere pittance to its incumbent, men of ability will not undergo the training necessary to prepare them for its arduous duties. Consequently these positions to-day are occupied by men who are undergraduate students working for their tuition, students in medicine or law, tutors in some other branch of college instruction, or resident physicians. In only three or four instances are thoroughly trained gymnasts employed

to superintend the gymnasium. Under such circumstances the men are obliged to make their gymnasium work a secondary consideration, and a man cannot do his whole duty by this department and attend to another at the same time. Yet this is what nearly every college instructor in gymnastics is doing. He intends to make his present position a stepping-stone to something else. He devotes as little time as possible to its duties, and expends his energies in preparing for his life pursuit. As soon as he gets his diploma he resigns his position and makes room for the next incumbent. It matters little who his successor is, but to meet the demands of the times some one must be catalogued for the place. The demoralizing effect of these annual changes can easily be imagined and may readily be seen by those who care to visit our college gymnasiums.

We say, then, that the proper physical training of our youth can never be accomplished until our gymnasiums are put in good hygienic condition, furnished with appropriate apparatus, and placed in charge of thoroughly competent instructors. To these requirements we will add the most important one of all, — that the gymnasium exercises be made a part of the regular curriculum. So far as

relates to the training of the mind, a system of required exercises has been universally adopted; but the training of the body has seldom been deemed of sufficient importance to merit like care and attention. We cannot but believe that this mistaken idea has arisen from a misconception of the real function of physical exercise and of its powerful influence upon the system at large. So long as body and mind are kept in antagonism and the demands of one are thought to be prejudicial to the interests of the other, little advancement can be made in physical education. But when it shall be generally known that the object of muscular exercise is not to develop muscle only but to increase the functional capacity of the organs of respiration, circulation, and nutrition; not to gain in physical endurance merely but to augment the working power of the brain; not to attain bodily health and beauty alone but to break up morbid mental tendencies, to dispel the gloomy shadows of despondency, and to insure serenity of spirit; when men shall have learned that much of the ill temper, malevolence, and uncharitableness which pervade society arises from feeble health, and that the great mental and moral disturbances which sometimes threaten the stability of a government may

be traced to physical causes, then will the training of the body rival in dignity and importance the training of the mind, for the interests of mind and body will be recognized as inseparable. This time is coming, though as yet some of our best and greatest thinkers, while admitting the value of physical exercise as an agent of health, still doubt the expediency of making it a department of education. They argue that a college is designed to give a boy an intellectual training and is in no way responsible for his health and physical welfare. But when we consider that it takes from six to twelve years for a boy to complete his education, that during this time he is almost constantly away from home, and that it is a period with him when the body is peculiarly susceptible to good or evil influences, it would seem that those under whose charge he is placed should have some intelligent care of his physical as well as of his mental and moral training.

When boys come home from the fitting school equally prepared in body and in mind for the duties before them, it will do to talk of making our higher institutions of learning training schools for the intellect alone; but while our colleges are filled with students whose minds have been forced and "crammed" in order to build a reputation for

masters and tutors; while class after class enters, well grounded in the classics and totally ignorant of the first principles of physiology and hygiene; while hundreds break down yearly for the want of physical stamina; while precarious health is the rule and a sound and vigorous constitution the exception, it is little less than criminal folly to talk of such a course. The body must be cared for, and when and how are the only questions open for discussion. If our preparatory schools were more generally patronized and more liberally furnished with appropriate appliances, we would say that here was the field for physical training. But under present conditions the work, if done at all, must be done in college; and in college the first essential is to put this work on an equal footing with every other. If attendance at chapel or recitations is required, attendance at the gymnasium should be insisted upon. Make this one of the stated requirements, and the student will look upon it as upon any other college duty. The great majority of students are disposed to do what is thought best for them, and the complaint arises — when complaint is heard — from a failure on the part of the faculty or the managing boards to make provision for regular advancement in the exercises which they have introduced.

To keep a class drilling from two to four years with wooden dumb-bells and Indian clubs only is as great a mistake in a scheme of physical education as it would be to confine the same class exclusively to the study of geometry, with a view to giving them a thorough mental training. Such exercises are elementary in their nature and in a prescribed course they should precede all others. But after they have done their work, which is to render the joints supple rather than to develop the muscles, the student should be allowed to go higher. A change is necessary not only to meet the demands of increasing strength but to keep up an interest. The pupil must have something to look forward to, something to struggle with and to master.

In no place can a system of physical culture be carried out better than in a well-disciplined college. Before the freshman class begins gymnasium work every member should be examined physically, as he had been examined mentally before entering college. Then, instead of putting all in one class and adapting the prescribed exercises to the capacity of the weakest, the class should be graded according to the needs of its individual members and the exercises arranged to correspond. Those with flat chests and consumptive tendencies should be put in one

squad; those with weak backs and slender waists in another; those with strong bodies but undeveloped limbs in a third; and so on, until the whole class has been divided into squads composed of men of like capacity and requiring similar treatment. The duration of this special training would of course depend upon the condition of each student and should be left to the discretion of the instructor. After personal deficiencies have been corrected the students should be transferred to the regular gymnastic class, and the members of this class should be led on from one piece of apparatus to another, until all the popular appliances of the gymnasium have been brought into service. By changing the course of instruction from term to term and allowing some freedom of choice, a lively interest could be maintained which would add greatly to the benefit of the exercise. At the close of the first year the class should be examined in its work and grouped the next year according to proficiency. The books of the director should be open to inspection, so that the vital statistics of each man recorded at the beginning of the year could be compared with those taken at the close. By such a system the physical condition of every student in college could be readily ascertained and the value

of regular and progressive exercise be put to the test. The course that we have described is essentially practicable, — is, indeed, substantially that pursued at Harvard University, — and we believe it to be the only one by which the gymnasium can be made to minister to the wants of all and its exercises rendered educational.

As a rule students take about the same rank in required gymnastics that they do in their regular studies. Whether this is due to a superior ability or to a better *morale*, we will not attempt to say; but we can say that those who fail in their studies from want of application or from habits of inattention will be likely to fail in gymnastics for the same reason. In physical exercises mental characteristics always manifest themselves. Brain and nerve substance is behind every well-controlled muscular movement. Indeed, the two are so closely connected that it is hard to tell what is due to the mind and what to the body. We mention this in order to dispel the idea so generally entertained that in the so-called physical exercises brute strength always predominates.

In the system which we propose, we would not leave out of consideration boating, baseball, and other popular pastimes, but we would have them regarded

as recreative exercises, and as such taken during the hours allotted to pleasure and relaxation. So far as they go they afford the best kind of development; but to those students who pursue these sports vigorously and earnestly gymnastics must act as a corrective, and a special course should be followed with the idea of bringing into action the muscles which a particular pastime has left unemployed. By such a method the gymnasium is made not only a school of physical training but also a school of moral discipline. The accomplishment of difficult feats may not in itself amount to much, but the required development, the habit of self-control, and the rapid and responsible exercise of judgment so frequently called for are powers gained which cannot fail to be of service to a man in any vocation in life.

In looking over the whole field of physical sports and games we can find nothing so well adapted to the complete muscular education of youth as the exercises of a well-appointed, well-conducted gymnasium. Every variety of apparatus can be introduced, all the movements can be arranged in a progressive series, and the entire system can be adjusted to meet and remedy the physical defects of each individual student. The times are ripe for action on this subject. Public thought is turning to

it as never before. People are asking with growing earnestness if nothing can help them to resist the destructive wear and waste of American business life. When insanity and the many forms of nervous diseases are on the increase, and when thousands of our educated young men are falling out in the battle of life for the want of strength and vigor, there is room for anxious questioning about our methods of physical training. Help must come from some source, and the suggestions which we have briefly offered in the present chapter will, we believe, secure the approval, because they will appeal to the reason, of intelligent thinkers.

CHAPTER VI

THE INDIVIDUAL SYSTEM OF PHYSICAL TRAINING

The importance of a good physique as a basis for a high moral and intellectual life would seem to be tolerably well recognized, for every writer on education from Plato to Herbert Spencer has dwelt upon it, and no nation has yet risen to intellectual eminence that has not had for its foundation a marked period of physical vigor. We, as a nation, are just beginning to realize that systematic bodily training is a valuable adjunct to mental education. Perhaps no one thing contributed more to inaugurate this new epoch in America than the building of the Hemenway Gymnasium by Harvard University. The erection of this handsome, spacious structure at our oldest and largest institution of learning was one of the highest tributes that could be paid to the cause of physical education.

In order that the reader may realize the true import of this educational experiment and the forces that have molded and shaped the results, it will be necessary to refer to the status of the

gymnasiums in this country prior to the building of the Harvard Gymnasium. Most of the colleges in New England and many of the cities in the Middle and Western states had gymnasiums before 1880, the year in which the Hemenway Gymnasium was opened. In a few of the college gymnasiums there were required exercises with dumb-bells, Indian clubs, and wands, and at Bowdoin College, in addition to these, a system of pulley-weight exercises had been introduced as early as 1870, as an essential part of the gymnasium curriculum. The gymnasiums of those colleges where the exercises had been left optional had become quite deserted, or had been given over almost entirely to the experts and professional gymnasts or to those who were training for some athletic contest.

If we seek for the cause of this decline, we find it largely due to want of appropriate apparatus, suitable instruction, and a laudable incentive for activity. The old-style gymnasium was equipped with heavy, cumbersome apparatus, poorly adapted to the purposes for which it was originally designed. The size, shape, kind, and quality of material used in ropes, bars, swings, ladders, and other appliances seem to have been left entirely to the judgment of the college carpenter, or were copied directly from

some antiquated German gymnasium. In consequence of this neglect of detail a great deal of the apparatus was so constructed as to discourage most persons from using it.

Then, too, there was a great lack of light, portable, and adjustable apparatus. If a person went to the gymnasium, he was obliged to enter into competition with experts whose time and energies were given to the performance of particular feats on special apparatus; or at best he was forced to support his own weight in swinging, climbing, or hanging, before he could properly prepare himself for such arduous exercises. Concerning these early attempts in using the gymnasium, Dr. Edward Jarvis says:

> Those who engaged in them made, or endeavored to make, the exertion which only strong men could make. But they were soon fatigued and left the gymnasium; or, if they persevered, were nearly exhausted. The error was in not adapting the mode to, and measuring the amount of exertion by, the strength of those who needed it. The students of Cambridge, in 1826, complained that they were fatigued, and sometimes overcome, rather than invigorated, at the gymnasium, and were unfit for study for some hours afterwards.

Again, as late as 1868, Dr. Jarvis says:

> If these exercises had been arranged and measured so as to correspond with the little strength of sedentary men, they might have still been in general use, and productive of great advantage to health.

This is the keynote to the reform that was started in New York City in 1878, where the attempt was made to ascertain the strength and physical condition of the individual by dynamometers and other testing and measuring appliances, and then to adapt the apparatus, by means of pulleys, levers, and adjustable weights, to the strength or weakness of the person as determined by a physical examination.

This method was evolved after ten years' experience and observation among the student class of the community. Its history and development is so closely connected with my own experience that I shall be obliged to introduce a brief autobiography.

In the fall of 1869 I accepted a position as director of the gymnasium at Bowdoin College, Brunswick, Maine. At that time I began to make measurements of students and to observe the difference in size, strength, and development that characterized different habits and conditions of life. Two years later attendance at the gymnasium was made compulsory for all classes, and I was called upon to devise a system of exercises that would be at once efficient, progressive, and popular.

In thinking this matter over I could not shut out from my mind the marked difference in physique of the men who had come under my observation. Some

of them were six feet in height and weighed over two hundred pounds; others had a stature of less than five feet and weighed under one hundred pounds. Some could lift a thousand pounds and push their weight up between the parallel bars from twenty to forty times, while others could not lift one tenth of this amount or push their weight up once. Had these young men been required to pass a physical examination and come up to a certain physical standard before entering college, the task of devising a scheme of appropriate exercises would have been a simpler one. To expect that a class of individuals varying between these extremes could be grouped together and given the same kind of exercise with any hope of benefiting all seemed to me little less than absurd. Yet this was the Dio Lewis plan, and at that time I had no other system before me in America as a guide.

In looking over the records of the students I had examined, I found that the young men who had been accustomed to walk long distances to and from school, and to spend certain portions of the year doing manual labor on farms, or in mills and lumber yards, generally showed a superior physique, unless the work had been excessive and begun at too early a period. Moreover, I found that the

young men who had been accustomed to special employment, such as blacksmithing, wood chopping, and milking cows, showed a special development in certain parts of the body, as the forearm, upper arm, and back, while they were lacking in the development of other parts. In this way I went through the list, marking the peculiar development that seemed to accompany the special occupations and exercises to which the boys had given attention before coming to college.

The conclusion that I reached was this: If actual labor will produce such good physical results in certain directions, why will not a system of exercises in the gymnasium, resembling actual labor, accomplish the same results in opposite directions, and in this way be made to supplement the deficiencies of one's occupation and to develop the individual where he is weak? With this idea predominating, I began to work for its attainment in 1871.

Owing to a lack of funds, the nearest approach that I could make to the realization of this idea at Bowdoin College was the establishment of a lot of crude pulley-weight appliances of different heights and weights.[1] Pulling window weights over a wooden

[1] I ought to add that we used the wooden dumb-bells and Indian clubs to alternate with the pulley-weight appliances in class exercises.

roller by aid of an iron handle, in a cold, unfinished building, four times a week, did not impress the faculty as an exercise that would be likely to add to the popularity of the required system, and I think that they had some doubt as to the expediency of letting an instructor "who was only a freshman" try the experiment. The experiment was tried, however, and it proved so successful that I was able to leave the department the next year in charge of assistants, who were also students, and spend three months in New Haven, trying to introduce the same system at Yale College. I mention this fact in order that it may be seen that the success of the new movement was largely due to the peculiarity of the exercise and not to any personal force or character behind it. In fact, I now know that, without realizing it, I hit upon one of the great principles that should govern all artificial exercise.

After the completion of my medical studies in 1878 I elaborated my old system of measurements, and had the first patterns of my long-contemplated developing appliances constructed. These consisted of what are familiarly known as chest-weights, chest expanders and developers, quarter circles, leg machines, finger machines, and other devices to the

number of forty different pieces. These appliances were first used in my private institution in New York City in 1878. It would seem that this style of apparatus met a long-felt want, for it immediately sprang into popular favor and was soon copied in one form or another by various manufacturers, and has since been generally introduced into the school, college, athletic club, and Young Men's Christian Association gymnasiums throughout this country and in different parts of Europe. To what extent it is now used in the United States may be inferred from the fact that some of it has been put into three hundred and fifty or more institutions, representing a total membership of over one hundred thousand.

Thus it will be seen that the individual system of physical training has not been of recent or sudden growth, but is rather one that has been undergoing a process of slow development.

When invited in 1879 to take charge of the Hemenway Gymnasium and superintend its equipment, I found both the building and the university spirit admirably adapted to its introduction. The large brick pillars which would have been an obstacle to the class system proved to be especially favorable for the attachment of the chest-weights

and other developing appliances. The wall space readily lent itself to the attachment of the remaining machines, thus leaving the floor space behind the pillars and in the center of the room available for the fixed, portable, and pendent pieces of apparatus. At the opening of the gymnasium in January, 1880, the equipment was as follows: four hundred and seventy-four lockers, five tub baths, nine sponge baths, twelve bowls, one shower room with ascending douche, two needle baths, and a large central shower bath. The apparatus consisted of eighty developing appliances and different forms of pulley weights; thirty-eight pieces of heavy apparatus, fixed and portable, such as vaulting bars and parallel bars; thirty-four pieces of pendent apparatus (rings, swings, and ropes); one hundred and fifty pieces of light apparatus, such as dumb-bells, clubs, and wands; six mattresses; eight bowling alleys; sixteen hydraulic rowing machines; a baseball cage, fencing room, sparring room, and running track.

How to make this equipment available to the greatest number of students was the next question to be considered. In an institution where attendance at chapel and lectures is optional, it has not seemed advisable to require attendance at physical exercises. There were two other alternatives left

for attracting students to the gymnasium: it was possible either to appeal to the spirit of emulation and competition and offer prizes for those who distinguished themselves in practicing some particular exercises, or to appeal to a still higher motive, namely, the sense of duty which each man owes to himself to improve his physical condition and keep strong and well, that he may be able to bear his burdens in the world and help to advance the average condition of the race.

The first plan had in its favor the prestige of many centuries' use in schools, and is still the great lever, coupled with fear of punishment by being dropped or deprived of a degree, that our colleges and universities apply to keep students up to their work. The second plan was practically untried in the field of education. To be sure, most men come to college to prepare themselves for their life work; but the idea of training for a contest that is really to begin six or eight years later, without any sign of immediate honor or preferment except what is indicated by a tape measure or a dynamometer, is not at first an attractive one. In the emulative plan a man is invited, and in fact incited, to compete against others. In the individual improvement plan he is invited to compete against himself, that is, against his own

physical condition, or his own record of skill, strength, and endurance, taken at regular and stated periods.

That we may better understand the individual system in its present form as carried out at Harvard University, it will be necessary to outline one of the physical examinations of a student and see what is done for him. Every student who enters the university is entitled to an examination, and eighty-seven per cent of the whole number avail themselves of this privilege. As soon as the student presents himself at the director's office (which is done by application and appointment) he is given a history blank, which he fills out, stating his birthplace, nativity of parents, occupation of father, resemblance to parents, natural heritage, general state of health, and a list of the diseases he has had, all of which information is absolutely necessary in order for the examiner to put a correct interpretation upon the observations to follow. The student is then asked to make certain tests of the muscular strength of the different parts of his body, and to try the capacity of his lungs. He then passes into the measuring room, and has his weight, height, chest girth, and fifty other items taken. His heart and lungs are then examined before and after exercise, and a careful record made of the conditions of the skin,

muscles, spine, chest, shoulder blades, feet, and various other parts.

All the items taken are then plotted on a chart made from several thousand measurements, and the examiner is thus able to know the relative standing of this individual as compared with others for every dimension taken; also his deviation from symmetry, and the parts which are in special need of development. To confirm the plotting of the chart and to awaken in the young man a genuine interest in his physique, photographs showing three positions are taken of each student desiring them, and these are preserved for comparison with those to be taken of him later. From the data thus procured a special order of appropriate exercises is made out for this student, with specifications as to the movements and apparatus he may best use. At the present time this special order consists, for most students, in an illustrated handbook, in which the apparatus, the weights for it, and the times to use it are carefully prescribed, together with such suggestions as to diet, sleep, bathing, clothing, and exercise as will best meet the needs of the individual under consideration.

Now we think it will be admitted by all thoughtful persons that one half the battle for the mental education has been won when there is aroused in a

boy a genuine love for learning. So one half the struggle for physical training has been won when he can be induced to take a genuine interest in his bodily condition, — when he desires to remedy his defects, and prides himself on the purity of his skin, the firmness of his muscles, and the uprightness of his figure. Whether the young man chooses afterward to use the gymnasium, to run, to play ball, or to saw wood matters little, providing he succeeds in improving his physical condition.

The modern gymnasium, however, offers facilities for building up the body that are not excelled by any other system of exercise. The introduction of the new developing appliances has opened up the possibility of the gymnasium to thousands to whom it was formerly an institution of doubtful value. The student is no longer compelled to compete with others in the performance of feats that are distasteful to him. He can now compete with himself, that is, with his own physical condition from week to week and from month to month. If he is not strong enough to lift his own weight, the apparatus can be adjusted to a weight he can lift. If he is weak in the chest or the back, he can spend his time and energy in strengthening those parts without fear of

strain or injury. In fact, he can exercise for an hour, going from one piece of apparatus to another, keeping always within the circuit of his capacity and adding slowly and surely to his general strength and powers of endurance. If the heart is weak, the lung capacity small, the liver sluggish, the circulation feeble, or the nervous system impaired, special forms of exercise can be prescribed to meet these conditions.

Gentle running is likewise commonly advised as a constitutional exercise for all those who can take it. This is usually severe enough to start the perspiration and make a bath of some kind desirable. A tepid sponge or shower bath is generally advised, and in our opinion the bath which regularly follows the exercise at the gymnasium, and the habit of bathing established thereby, are almost as valuable as the exercise itself.

After a period of six months or more the student returns again to the director's office and undergoes another examination in order to ascertain what improvement he has made and to receive any new suggestions.

This, in brief, is the educational part of the system of physical training carried on at the Hemenway Gymnasium.

For the system of athletics and heavy gymnastics carried on at the college during term time the authorities are in no way responsible. These are managed by the students themselves through their different athletic organizations. The faculty exercises a conservative influence by requiring every man to be examined and to get a certificate from the director of the gymnasium before he can enter as a competitor in athletic contests. By taking this precaution many a student whose zeal for athletics was in excess of his ability has undoubtedly been saved from injury, and the standard of the sport has been maintained. The authorities believe that athletic sports, kept within bounds and carefully regulated, are a valuable adjunct to our system of physical training, and they are constantly making endeavors to increase Harvard's facilities in this direction.

Some of us, moreover, believe that it is more to the credit of a university to have one hundred men who can make a creditable performance in running, rowing, ball playing, and similar sports, than to have one man who can break a record, or a team that can always win the championship. The great aim of the gymnasium is, therefore, to improve the physical condition of the mass of our students and to give them as much health, strength, and stamina as

possible to enable them to perform the duties that await them after leaving college.

Having thus given some idea of the practical working of the individual system at Cambridge, let us now turn our attention to a consideration of some of the principles and theories upon which it is founded.

"The characteristic physiological property of muscular tissue, and that for which it is employed in the body," says Martin,[1] "is the faculty possessed by its fibers of shortening forcibly under certain circumstances." This property is called contractility, and upon the full performance of this function depends the healthy condition not only of the muscles but also of the various parts of the body with which they are connected.

Now what are the circumstances under which a muscle performs its greatest contraction?

First, there must be a succession of strong and oft-repeated *stimuli;* second, the muscle must have a load to carry or there must be some resistance to its shortening.

This may be illustrated by the experiment so often conducted in the physiological laboratory. Apply a

[2] *The Human Body* (Chapter X), by H. Newell Martin, D.Sc., M. A., M.D.

stimulus to a muscle which has no weight attached to it. The muscle will contract perhaps a quarter of an inch. Now attach a weight of one pound to it and apply the same stimulus. The muscle will contract half an inch. Attach a still heavier weight of two pounds, and when the same stimulus is applied the muscle will contract one inch. And so the experiment might be continued until a weight is attached which will cause the contractions of the muscle to be less and less until they finally cease; "so that," continues Martin, "up to a certain limit resistance to the shortening of a muscle makes it more able to shorten, and the greater extension of the muscle, due to the greater resistance opposed to its shortening, puts it into a state in which it is able to contract more powerfully."

Upon the interpretation of this simple physiological fact depends the foundation of two great systems of physical training: one faction advocating that the antagonizing muscles in free movements, without apparatus, furnish all the resistance that is necessary; while the other faction claims that the resistance afforded by opposing muscles is not sufficient, and that apparatus with weights of some kind is necessary to bring out the working force of the muscle used.

The latter conclusion is believed by us to be the correct one. The study of the human skeleton as a whole and in parts, the peculiar formation of the tuberosities and prominences of the bones, and the size and strength of the muscles attached to them, all go to show that the limbs were designed not only to be moved but also to help man bear his burden, overcome obstacles, and fight his way in the world. Where do we look for the best specimens of physical development, if not to those engaged in all-round, vigorous, manual labor? "Yes," as Maclaren says, "exercise, which is voluntary labor, must resemble actual labor, if it be desired to obtain from it the physical advantages which actual labor bestows."

The work done by a muscle in a given contraction when it lifts a weight vertically against gravity is measured by the weight moved, multiplied by the distance through which it is moved. This test furnishes the best means of judging of the efficiency of a system of exercises. We saw in the laboratory experiment that when the muscle simply lifted its own weight it did no work, and that nothing was accomplished when it tried to lift a weight too heavy for it; but that there was an intermediate weight which it lifted to the greatest height, when it did the greatest amount of work.

What is true of this single muscle is true of all the muscles of the body: there is a certain weight by means of which the different groups of muscles can do the most effective service in a given time. If the weight is too light or too heavy the best effect of the exercise is not realized. This may be illustrated by the familiar use of the chest-weights, as "chest-weights" have been mentioned before. If one goes through the movements without any weight the exercise is insipid. If, on the other hand, one loads the boxes up to their full capacity, it will be found that there are but one or two movements that can be made and these only for a minute or so. Now if one carefully gauges his strength to about five pounds (which is, perhaps, the average weight used in these appliances) he can go through the full set of exercises (comprising some forty or fifty separate movements) and feel that something is accomplished which will prove of benefit. This statement is equally true of all the different developing appliances found in a well-equipped gymnasium; and to the fact that our modern apparatus can be adjusted to the strength of the strong and the weakness of the weak as well as to the particular muscles in need of development may be attributed a large part of the value and popularity of gymnastic institutions.

But there is another principle now taken advantage of, and to this the modern gymnasium owes a great part of its efficiency. In view of the tendency of the times we cannot help thinking that it is a valuable one.

In primitive races, individuals of the same tribe bear a close resemblance to each other. As races progress in civilization, difference of function begins to work a difference in structure and we begin to get a marked variation in size, form, and feature. In highly civilized communities the minute division of labor carries this variation still farther, so that it is possible in many cases not only to distinguish the calling of individuals but also to determine, by means of its influence upon their physical structure, the particular branch of that calling in which they are engaged. In other words, men are molded by their trades and occupations, and many of the diseases with which they are afflicted arise from physical defects due to faulty positions and want of appropriate exercise. Perhaps no class in the community has its physical characteristics more strongly marked than the student class. The type may be distinguished by a drooping head, flat chest, hollow back, and constricted ribs just over the stomach. It is not necessary to look for the causes of these defects.

They are faulty positions while studying, pressure of the desk against the body, the constriction of clothing during the growing period, and the relaxed state of certain muscles and the overstrained condition of others.

Most occupations, including that of the student, tend to overwork the flexor muscles and to compress and constrict the body, thus lessening its internal capacity and interfering with the functions of important organs. Similarly the resistance of the clothing, weights lifted and borne on the back or shoulders, and even the use of heavy dumb-bells for health's sake, all tend to force the ribs downward and lessen the diameter of the thorax. To remedy this evil a system of artificial exercise is necessary.

Just here we touch upon a principle that has escaped the attention of most teachers. If this deformity is brought about by the natural action of the muscles, that is, by their acting centripetally from their origins to their insertions, surely the remedy is to make them act centrifugally from their insertions to their origins. By grasping a bar or a pair of rings above the head, the parts where the muscles are inserted become fixed, and if the muscles contract the parts from which they originated must move. In this case all the diameters of the thorax are

increased and the chest capacity enlarged. In this principle lies the value to those who are able to use them of the rings, trapeze, ladders, parallel and horizontal bars, and in fact of all the climbing appurtenances. By the invention of the chest expander, chest developer, quarter circle, high pulleys, inclined planes, traveling parallels, and similar apparatus the same principle may be applied by any one, however weak, and the same result accomplished. It requires a little more time, but the effect is likely to be more lasting. By the use of the pulley-weight system, resistance may be applied to any part of the body from any direction. In this peculiar property lies its great value as a means of enlarging the thoracic cavity and counteracting the cramping and constricting tendencies of modern occupations.

We have dwelt upon these principles at some length because we have reason to believe that they have not been well understood by persons interested in the subject. Still other important theories that have guided us in formulating a system of exercises under the individual method of physical training remain to be presented. So far as we have been able to discover they are based on sound physiological principles. They may be stated in the form of a summary.

1. In order to secure the necessary volitional power to start the movement the person should be sufficiently interested in the exercise to give it his attention. Whether the exercise is interesting in itself is a matter of little consequence.

2. In order to bring out the working force of the muscle there should be a weight or resistance to overcome. In using a weight the muscle gradually acquires the force with which it tries to contract.

3. The exercise must be performed with sufficient vigor and rapidity to engage the energetic contraction of the muscles employed. When this is done old tissue is broken down and its place is supplied with new material in increased quantity, thus augmenting the size and strength of the muscles. The brain gains the power and energy which the exercise requires it to put forth.

4. Weak parts must first be strengthened, and then as many muscles as possible must be brought into action in order to secure a full-orbed and harmonious development of the whole body. One-sided development is usually attained by robbing some unexercised part of the body of its just share of nutriment. Most persons in their daily occupations use the flexor muscles more than the extensors, thereby cramping the vital organs and interfering with their

functions. To remedy this tendency the muscles, in all forms of artificial exercise, should be made to act from the center as far as possible.

5. A sufficient number of muscles should be called into action at one time to stimulate the action of the heart and lungs and increase the circulation and respiration. This is one of the most important considerations to bear in mind in regard to exercise. To keep up this increased respiratory activity and to aid the heart in removing the waste material and hastening forward the new, the limbs and the walls of the chest must be absolutely free from any ligatures or constrictions. The slightest interference with the action of the respiratory muscles at this time embarrasses the functions of the lungs and heart. This is the reason why loose clothing is always advised for exercise.

6. A momentary period of rest should, so far as possible, precede all movement in exercise. This is best secured where there is an alternation in the movements, as in walking, running, and rowing. All tetanized movements, such as holding weights, attitudinizing, and standing or sitting in a constrained position, tend to impair the tone of the muscles by interfering with the nutrition of both muscles and nerves.

7. The exercise of the young should be of such a composite nature as to bring about the coöperation and coördination of the muscles. This involves principally the training of the central nerve system; all gymnastic sports and athletic games that require skill, dexterity, coolness, courage, and presence of mind are included in the requisites for this, and are exceedingly valuable to any system of physical training as adjuncts in the development of character.

8. All vital processes depend largely upon the maintenance of animal heat. But animal heat is now known to be generated in the blood while passing through the muscles, and not in the lungs, as was once supposed. The full contraction of the muscles greatly aids this function, and helps to force the warm blood through the tissues and back again to the heart.

9. In order to realize the best results from physical exercise and to keep up the general nutrition of the body, all muscular effort should be followed by a bath or vigorous stroking and rubbing.

10. In every kind of physical exercise the qualities at first required are the qualities at length developed. Thus, if the exercise requires strength, strength will be the result; if courage is exacted,

courage will be the outcome; if quickness, quickness; and so through the whole range of faculties exercised.

The highest development of strength, activity, and grace is, however, not compatible in the same individual, and consequently many persons prefer to sacrifice one in order to gain the other. Robust, vigorous health can be maintained only in a body in which life's forces are well adjusted and well balanced.

CHAPTER VII

THE REGULATION AND MANAGEMENT OF COLLEGE ATHLETICS

The primary purpose in the establishment of the Hemenway Gymnasium, as shown in the previous chapter, was to give to all the students of Harvard University facilities for acquiring a symmetrical and healthful physical development. It was no part of its purpose to make the students athletic "performers," or semi-professional ball players, or abnormally "strong men." Yet the work of the gymnasium does connect itself naturally and closely with the matter of college sports and competitive games, and before leaving this part of our subject I wish to consider how these games can be so regulated and managed as to do the greatest good to the greatest number and prove an aid and not a hindrance to the general cause of education.

To those who have given the subject little thought this may seem a simple thing to do, but it is one of the most difficult problems our school and college authorities have to solve. Just why this is so

cannot be fully stated within the limits of this chapter. Some of the difficulties, however, may be briefly summarized.

1. The peculiar nature of many of these sports, the tendency being for all antagonistic games to exterminate themselves unless carefully protected by strict rules and regulations.

2. The natural tendency to professionalism and the accompanying decline of interest in amateur sports. This evil has been the bane of athletics from the time of the ancient Greeks to the present day.

3. The mercenary motives aroused by the pursuit of sport as a business instead of a recreation or a means of physical training, and the many evils of betting.

4. The prominence given to athletics by the public press.

5. The attitude of educators and distinguished men in regard to them.

6. The attitude of the young men themselves.

Did space permit, it would be instructive to take up these problems in order and consider the influence they have had upon the growth and character of athletics. We shall treat at length of the last two only, — the attitude which the educators and the young men have taken toward athletics during

the past twelve years. This will serve as a basis for what we have to say concerning the regulation and management of these important exercises.

Notwithstanding the experience of the past and the theories advanced by the best educators, the physical training of the young has been left largely in their own hands. Many have thought that the love of sport and the enthusiasm of youth would furnish all the exercise necessary for the maintenance of health, and until within recent years no recognition has been given to sports by our institutions of learning and no provision has been made for their practice. Their existence has been the result of a struggle between the young blood and the old, in which the former has gradually gained the advantage. Our college faculties have for the most part vigorously opposed every advancement of sport, from the introduction of the bowling alley to the eight-oared racing shell. There is a tradition that the student who brought the first boat to Harvard was suspended from college for six months.

But the opposition has not been confined to sport: it has extended to every form of physical exercise. It would seem that institutions of learning have been still hampered by the traditions of the church and the monastery, for every attempt to educate the body

and to treat it as a coworker with the mind has been frowned upon and discouraged. Notwithstanding the fact that most of the arguments used in favor of physical training were formulated from facts and principles taught in our colleges and medical schools, those institutions have not taken the initiative in this movement for physical education, but have gradually yielded to the pressure of public opinion which a few enthusiasts on the subject have created.

Some of our larger institutions have recognized the fact that sports and games make a part, but owing to their necessary and natural limitations only a minor part, of a wise system of physical training. For this reason they have built gymnasiums designed to meet the wants of all classes and have appointed instructors more or less qualified to look after the needs of all students. But gymnasiums cost money and good teachers are not to be had for a small sum. Without the proper equipment and teachers of intelligence and ability, the gymnasium becomes dull and uninteresting and fails to excite enthusiasm in young men already wearied with routine work. When left to itself it soon becomes a training school for specialists and is rarely frequented by those who most need its advantages. The enthusiasm of the

times has been for athletics, and as these are largely supported by subscriptions, those colleges that were wanting in resources and were not provided with well-equipped gymnasiums urged most strongly the practice of recreative games.

It would almost seem that the opinion of college faculties regarding certain sports has been influenced by the standing of their various athletic organizations and by the facilities offered for the practice of certain exercises. Schools and colleges have vied with each other to see which could present to ambitious youths the greatest attractions in this direction, and when it was imagined that the winning of a boat race or a baseball championship would gain for the institution ten or twenty students the victory seemed worth striving for.

In such an atmosphere and under such fertilizing influences it is hardly surprising that athletics, a few years from their inception in some of our colleges, acquired a rank growth. The peculiar phases of this growth, and the different conditions under which it flourished before the winnowing and reforming process began, may be inferred from the remarks of several college presidents on the subject. Let us quote them:

The college is not intended for promoting boating. Yet in college there must come up an interest which promotes physical culture. Young men must have exercise, relaxation, and social pleasures, and they find these in such emulative exercises as boating. We think boating a good thing; then our maxim is, "A good thing should be well done." But boating must be a pursuit of the student's own choosing. I have little faith in forced attendance on physical exercise. To make a success, the student's heart must be engaged in it. Being voluntary, the boating interest of a college is just what the students make it. Students will give boating its position by the public sentiment they maintain in regard to it. Concentration is a lesson of boating. A man cannot pull who cannot give his whole mind and strength to the work.

We should all be disappointed, even the oldest of us, if our college did not maintain her preëminence in the coming contest this week.

These are the sentiments of the late ex-president of Yale College, taken from his remarks (as reported) at the inauguration of the boathouse some years ago, and from his speech at an alumni dinner.

The ex-president of Columbia is quoted as saying on this subject:

I do not think that the athletic exercises of the students interfere at all with their intellectual labors, but rather believe that they are of decided benefit to the young men, augmenting their stock of health and increasing their powers of mental application. We have not found that a fondness for athletic exercises tended to render students indifferent to their progress in class, or influenced them, when exercising their right of selecting subjects for study, to choose easy branches or diminish their application. On the

contrary, we have had to restrain some of our athletes from undertaking more intense application to a wider range of study than we deemed advisable, and some of our brightest graduates have been men who distinguished themselves in athletic sports.

We may quote also from one of the annual addresses of the ex-president of Brown University:

The multiplication of students' clubs, associations, and societies that call for intercollegiate games has now reached a point where some kind of restrictive action would seem to be called for. The number of absences required by these games is more than is consistent with the best results of scholarship. Athletic sports are admirable when engaged in as a means to health and physical vigor; but when pursued for their own sake, or as a preparation for intercollegiate contests to which college duties are to be subordinated, the result cannot fail to be mischievous.

The ex-president of Princeton University expresses himself very forcibly on this subject of athletics:

The keenness of the pleasure felt in athletic sports has led to excesses. The evil has appeared not so much in the exercises of the gymnasia as in their accompaniments, especially the competitive college games. What is immeasurably worse, they come to absorb the interest and enthusiasm of the young men who continue their academic tasks, but continue them as tasks, seeking to have only so much scholarship as may enable them to pass at the examination, and ever seeking to be relieved from their lessons to go to more genial pursuits.

In the annual report of 1882–1883 the president of Harvard said:

Intercollegiate contests in athletic sports demand further regulation by agreement between the colleges whose students take part in them. They are degrading, both to players and spectators, if conducted with brutality or in a tricky or jockeying spirit; and they become absurd if some of the competitors employ trainers and play with professional players, while others do not. The opinion of the authorities of Harvard College upon this subject is perfectly distinct; they are in favor of forbidding college clubs and crews to employ trainers, to play or row with professionals, or to compete with clubs or crews who adopt either of these practices. They are opposed to all money making at intercollegiate contests, and to the acceptance of money or gratuitous service from railroads or hotels, and therefore to all exhibitions or contests which are deliberately planned so as to attract a multitude and thereby increase the gate money. In short, they believe that college sport should be conducted as the amusement of amateurs, and not as the business of professional players.

We have quoted at some length the remarks of these college presidents, because we believe that they express not only their own sentiments but also the prevailing sentiments of their respective colleges and of the constituency that supports them. That there is a slight difference of opinion among them and a variance of views as to what constitutes the principal evil in question is apparent to all. That there is any logical sequence between the remarks of the first president quoted, made several years ago, and those of the following presidents may not have occurred to the reader; but to my mind there

is an almost direct relation of cause and effect between the assertion of President Porter that to make a success of any sport the student's heart must be in it, and that intensity of feeling which leads President McCosh to regret that "the keenness of the pleasure felt in athletic sports has led to excesses." There is a logical sequence between the statement of President Porter, that "a man cannot pull who cannot give his whole mind and strength to the work," and the restraint that President Barnard has found it necessary to exercise over some athletes to keep them "from undertaking more intense application to a wider range of study than we deemed advisable," and the broader assertion of President Robinson that "the number of absenses required by these games is more than is consistent with the best results of scholarship."

When President Porter said to the assembled alumni, "We should all be disappointed, even the oldest of us, if our college did not maintain her preëminence in the coming contest," he undoubtedly uttered a sentiment which found a response in every undergraduate's heart. It was a sentiment calculated to arouse the enthusiasm of all those who love their alma mater and to induce them to make every effort to bring victory to her shrine. Under

such circumstances it would naturally be expected that the zeal and ardor of youth would lead them to overstep the bounds of moderation and plunge into excess. With a president, a faculty, and a body of alumni urging the students on, but assuming no responsibility for their action and exercising no guiding influence over them; with a motto which might well be translated, "*Win, win, win!* — honestly if you can, but *win* anyhow," — we have all the conditions necessary to develop such tendencies as those which called from President Eliot the opinion that college clubs and crews should be forbidden to employ trainers, or to play or row with professionals.

The views expressed by prominent men who are interested in youth and education have been largely influenced by their own experiences and the experiences of those with whom they have been associated. As a rule, those who paid the least attention to physical training in their younger days and have suffered from this neglect ever since are the strongest advocates of the unregulated system of athletics. On the other hand, those who entered into the sports too vigorously, sacrificing time and energy and perhaps carrying their practice to such an excess as permanently to injure their health are now apt to be the radicals who advocate the total

abolition of all sports and games. Between these classes are those holding every variety of opinion, — some so absurd as not to be worth mentioning; but the more conservative sentiments — those that ask for regulation and reform — are advanced by men who have been athletes themselves and have practiced the sports not only from love of them but also as a form of exercise and means of development.

Perhaps the most serious evil which has threatened the usefulness of athletics has been the attitude of the young men, and especially of our college students, in overlooking the abuses attending them and the necessity for reform. That the stand they have taken has been wrong and has tended to the discontinuance of athletics, no one can deny who has given the subject a careful consideration. But under the circumstances it was perfectly natural that our young men should reason as they did, and from their point of view it was perfectly logical. They had heard eloquent addresses on the value of health and strength and had read persuasive arguments in favor of physical exercise; they had seen thousands of dollars given to the education of the mind where one dollar was devoted to the improvement of the body; every one had said that athletics were good and that they should be encouraged; but every

attempt to give them recognition not merely as sports but as essential parts of college training, and to bring them under responsible supervision had been met with sneers of ridicule and contempt.

The athletic associations as they exist to-day in our colleges are largely due to the efforts of the students themselves. Rules and regulations have been borrowed from the English and Scotch associations, but the working policy of the different clubs has been shaped principally by the observation of results. College athletics were first practiced for recreation and amusement; but all sport is spontaneous and arises from the pleasure of acting, and that a number of men would feel like rowing or playing ball every day at the same time for the fun of it, is not probable. Where the sport or game requires more than one participant, there must be mutual agreement as to the time of meeting, the part to be played by each, and the regularity of practice.

To secure such agreement there must be an ulterior motive. The motive may be physical training for the health's sake. This is a worthy one, but hardly sufficient to bring eight, nine, or eleven young men together at the same time day after day for two hours' exercise, especially if they enjoyed vigorous health at the outset. A stronger motive

or stimulus is needed. This is found in rivalry and competition.

Class crews, ball nines, and football teams are formed, and the different classes support their respective organizations with money and enthusiasm. Other associations are formed with the same end in view, and finally college or university organizations are formed. To satisfy the desire for competition and to afford men the pleasure of measuring their strength with others, matches are arranged between classes and rivals are sought from other colleges. Here the danger begins, and unless the evils are met as they arise the unmistakable tendency is toward professionalism. The approach of this danger is so insidious that both students and faculties are slow to perceive it.

A college community is often called a little world in itself, and it is a world governed by the same passions and impulses that rule the world at large. So far as the physical condition of the athletes is concerned, they represent no one but themselves; but in their efforts to win a victory from their antagonist they represent the ardent hopes of a large constituency. This constituency governs the movements of the athletes and regulates the standard of the games; it pays liberally for the support

of athletic organizations and wishes affairs conducted according to its tastes. A half-hearted game of ball or a spiritless boat race or football contest would be regarded with derision, and a long series of defeats would deprive the athletic teams of their accustomed support. Every college desires its crew, nine, and eleven to do its best to win. The championship is the goal for which all are striving, and every effort must be put forth to attain it even if it has to be accepted by default.

The ardent desire for victory gives rise to improved boats, seats, oars, and rowlocks, in order that the crew using them may gain some mechanical advantage over its adversary. The same desire leads the different organizations to avail themselves of technical skill and to seek the services of professional athletes. A few points on the manipulation of an oar, the curving of a ball, or the handling of a bat may bring victory to the favored crew or team. The employment of experts, practice with first-class amateur organizations, and playing with professionals have been found to enhance the chances of success. If two afternoons a week do not afford the necessary practice to enable a team to keep pace with its rivals, six afternoons a week must be devoted to it, and as the standard advances and the

spirit of emulation increases a part of both forenoon and afternoon must be surrendered.

But twelve hours a day given to practice for fifty-two weeks in the year would not make a ball player, an oarsman, or a runner, unless the individual possessed the essential requisites at the outset. To secure at the start an athlete of acknowledged ability is a great gain to an association, and a young man of this class is much sought for. If he is connected with a preparatory school and is intending to go to college, he may be induced to enter a certain institution through the regular channel. If his natural proclivities or his means of living do not incline him toward the institution that most desires his athletic ability, superior social advantages, indirect assistance, or even pecuniary inducements are sometimes held out to him. But good athletes do not abound in fitting schools, and the demand is always greater than the supply. The opportunity of taking a special course, offered by many of our colleges, opens a way for desirable athletes who may not be able to enter the regular course. In this way men whose avowed intention is to engage in athletics for pleasure, or as a matter of business, may find entrance to some of our institutions of learning. In some of the colleges where the facilities for

entering special or graduate courses are not presented, and the competitive spirit runs high, desirable athletes have been engaged and paid a regular stipend for the express purpose of playing ball or participating in other sports.

In order to obtain the best practice and experience college men have often availed themselves of the opportunity to play on professional or semi-professional clubs during the long summer vacations. They claim to have received no money for their services and in this way keep up their standing as amateurs in the college clubs. As soon as their connection with college is over, however, some of these men gravitate naturally into professional organizations, and during the past few years a score or more of college-bred men have been playing baseball throughout the country as a matter of business. Here we meet the same tendency in the college community that we find existing in the community at large: it is the graded step from the amateur to the professional.

Another difficulty that our young men have had to encounter in the management of athletics has been in the collection and disbursement of funds. It is estimated that the annual cost of sustaining the different athletic organizations at Harvard is

about $50,000, and nearly the same amount is expended by Yale on her athletic interests. Formerly the various organizations were sustained entirely by subscriptions, the undergraduates and graduates from far and near contributing liberally to the support of the crew, the nine, and other teams. This expense fell heavily upon the smaller colleges, finally compelling them to concentrate their energies upon one or two sports.

The larger institutions also have felt this pecuniary strain, and to meet it have been obliged to resort to various methods, such as giving entertainments in the form of concerts, lectures, dramatic and gymnastic exhibitions. In this way the lovers of one kind of amusement contribute to the support of another kind. Some of the competitive sports and games, such as baseball, football, and track athletics, have resources within themselves. They are popular with the public, and by conducting them within closed grounds and charging gate money they can be made to pay something toward their own support.

In the opinion of many this course is advisable. When college officials venture the assertion that field athletics ought to be self-supporting, it is not surprising that the managers of athletic associations should try to make them so. With this end in view,

the games are conducted on business principles. The expenditures are kept down to a minimum, while the income is made as large as possible. If a railroad company offers free passes, or a hotel proprietor opens his house to competing athletes, or if retail dealers or manufacturing companies wish to print the programmes free of charge as an advertisement, their propositions are generally accepted as a matter of business; for money saved is money earned.

If popular sports are to be made self-supporting they must be made to draw. In athletics, as in everything else, nothing pays like success. If an ordinary gymnastic exhibition is given, the expenditures are likely to exceed the receipts. Let it be quietly understood, however, that A and B, two heavy-weight sparrers, are going to try to "knock each other out," and the athletic treasury will be replete. The same is also true of field sports. Nearly all of Harvard's practice games are sources of expense. A game in the championship series, however, always draws. In this respect the club that holds the college championship has a pecuniary advantage over the others, especially if so situated as to be able to play some of its games in large cities.

The need of money and the difficulty of gaining it, either by subscription or by gate receipts, are

strong inducements to struggle for supremacy. Victory means money in the treasury, while defeat means a lingering debt. The managers and officers of the various athletic organizations are judged by their fellow-students according to what they do. They wish to make as good a showing as their predecessors, if not to advance a little beyond them. This means to defeat their foremost adversary and leave their association free from debt. If they do not succeed in accomplishing these two objects, their season's work is considered a failure, and they get little credit for the time and energy which they have given to the cause, even if they are so fortunate as to escape censure. On the other hand, should they succeed in winning the championship or in vanquishing their strongest opponents at any cost, their cup of joy is full. They are congratulated by students, faculty, and alumni; the newspapers herald their names abroad; celebrations and banquets are given in their honor; their social and business prospects are assured; and their records and achievements are handed down to future generations.

Again we ask, Under such conditions, such allurements, and such incentives, is it strange that our young men should become enthusiastic over athletics and strive for the coveted prize, with its honor, glory,

and renown? Is it not really a foretaste of life in the world at large, and are they not judged by the same standards? And if we were disposed to moralize at this point, could we not in truth say that their athletic victories, including the preliminary training that leads up to them, are worth a hundredfold more to the present and future generations than many of the senseless baubles and inanities for which the world is struggling?

But the question that most concerns us is, How is this spirit of ambition and rivalry going to affect the general practice of physical exercise? We have seen that educators are divided in opinion as to the evils which have arisen in connection with athletics and as to the way of meeting them; while the students, from their standpoint, can see no evils and are practically united as to the manner in which sports should be conducted. It is for us to consider how the different attitudes are to be reconciled and opposing forces brought to promote the highest usefulness of physical training.

If the highest degree of excellence in any sport is the thing to be attained; if the winning of the championship is to be considered the only indication of success; if the physical supremacy of the few is to be maintained at any cost, and the amusement of

the many catered to; and if athletic sports are to be pursued as ends in themselves rather than as a means of physical training and development, then the present tendency of athletics is in the right direction. It is the natural process of evolution from crudeness to perfection, such as marks the progress of every art as an art.

The popular demand for physical exercise, the enthusiasm of youth, the love of excitement, the pecuniary interest, the influence of a certain portion of the press, and the policy of some of our institutions of learning, all tend to foster the professional spirit. Unless these influences are met by healthful controlling measures, our popular sports are doomed to lose their hold on public interest, and will eventually become sources of evil rather than of good.

In considering the remedies for the natural evils that attend athletic sports, our first thought is to let them assume such proportions as to bring about their own reformation. We are told that professionalism is a disease that cures itself, and if one sport sinks into degradation other sports will rise to take its place. We regret that we cannot share this faith. Three thousand years have witnessed the invention of but few sports. Ball playing and boat racing have come down to us from distant ages; and lawn tennis,

one of the most popular games of the present day, is only the revival of a game played by the ancients. We need all our sports. The physical stability of our people is not so well assured that we can allow these health-giving games to lose their hold upon the public.

In the light of a constant tendency to degenerate, we believe that the hearty coöperation of all earnest men is called for in an attempt to keep our recreative games up to the amateur or gentlemanly standard.

The first measure we would suggest is that prominent educators and college officials recognize athletic sports and come to an agreement as to the part they are to play in a system of education. In view of the prominence given to these sports in our colleges, the expense of maintaining them, and the evils that are associated with them, a college faculty that does not announce its policy and define its position with regard to this question is, in our opinion, false to its trust and shirks a great responsibility. A subject so important and of such great popular interest has naturally not escaped the notice of these faculties.

In most of our colleges, if not in all, it has long been recognized that athletics are good and necessary; in many, if not in most, it has not escaped

recognition that athletic contests need regulating. With this object in view an intercollegiate athletic conference met a few years ago and drew up a set of resolutions, with preambles. These resolutions were finally submitted to the several colleges. In order to make the regulations effective, it seemed best that they should be accepted or rejected as a whole, their adoption by any one college depending upon their adoption by at least five others. They were adopted as a whole by Princeton and Harvard, rejected as a whole by Yale, and accepted conditionally by a few of the smaller colleges. One college was in favor of adopting the first resolution but was opposed to the third; another college approved of the third but condemned the first; and so on through the entire number. The difficulty was that no one college (Harvard and Princeton not excepted) was satisfied with all the resolutions, and that no one resolution was satisfactory to all the colleges. As a result the conference withdrew the intercollegiate resolutions, and each institution was left to stand by its own.

The failure of this attempt at joint regulation and control of athletics was due to one great oversight, — neglect to recognize the part which the students and alumni were to take in the controversy. The

committee drew up its regulations under the presumption that each college faculty could, and was expected to, govern the actions of its own students. This was perhaps a natural presumption, but it proved to be a misleading one. Faculties and governing boards are influenced largely by the opinions and desires of their constituencies, and no matter how important or necessary the measure, if it fails to commend itself to the average intelligence of the college community, it cannot be adopted and sustained. Some of the committee took this lesson to heart, and since that time they have made their appeal to the students and to the community at large.

In the meanwhile, the evils which were so apparent to the committee at that time continued to increase until the year 1885, when the Harvard faculty found it necessary to prohibit all intercollegiate football games until the rules could be improved and provision made to enforce them. This prohibition was maintained for a year. A little later Harvard's athletic committee was obliged to check certain evils that had become connected with boating; to take measures to lessen the amount of betting at intercollegiate contests; to reduce the number of games played out of town; to exclude professional attendants from the floor of the gymnasium, and all

so-called "trainers" from the grounds of the university. Recognizing, however, that the students should have some one to superintend their sports, the committee recommended the appointment of an official trainer, who should be announced in the catalogue and paid by the corporation.

Just as the efforts made by Harvard's athletic committee were beginning to take effect, a committee appointed by the board of overseers in 1888 recommended the prohibition of all intercollegiate contests. The votes of the overseers following this recommendation led to a thorough examination of the whole subject by a committee appointed by the Harvard College faculty. Concerning the report of this committee President Eliot says:

This report, with the accompanying statistics, disposed of some of the common objections to athletic sports and intercollegiate contests, demonstrated their general utility, and set in a clear light the improvement of the average physique of the students, which the gymnasium and the various sports had together brought about. Although the report contained many criticisms upon the present management of athletic sports, its general effect was highly encouraging, both to the faculty and to the undergraduates, as to the moral and physical effects of athletics at Cambridge, taken as a whole. It immediately brought about a better understanding between the faculty and the students on the subject of great interest, concerning which there has been much divergence of opinion. Some of the recommendations of the report have

already been adopted, and others are likely to be. There are still many excesses and evils connected with athletic sports as intensified by intercollegiate competition; but the faculty take comfort in the general physical improvement which they witness in the average student, and they hold that dyspepsia is less tolerable than a stiffened knee or thumb, and that effeminacy and luxury are even worse evils than brutality.

In order that there might be a more harmonious working toward the end in view, the constitution was changed so as to provide for a committee on athletics consisting of three undergraduates and three graduates, together with three members of the college faculty. The committee as thus constituted has entire supervision and control of all athletic exercises, within and without the precincts of the university, subject to the authority of the faculty. This plan has worked admirably at Harvard, and although the new committee has done little more than to follow the lines laid down by the original committee, the regulations have been accepted with a better grace by the students and have been more generally lived up to.

Under the protecting influence of this committee and in consequence of the efforts it has made to improve Harvard's facilities for the practice of athletics, this branch of physical training is now in a flourishing condition. We no longer reckon success

by the number of championships held or the number of records broken, but by the number of men we can induce to take an active interest in the practice of some kind of athletic sports.

Concerning the policy and management of the various athletic teams, there is, however, still considerable difference of opinion. Some claim that the athletic committee should manage and dictate the policy of the ball nine, football team, boat crew, etc., as long as they make their public appearances in the name of the university. Others claim that this function should fall upon the graduates. Perhaps the largest number believe that the students should manage their own games. Personally we do not favor either plan. Athletic sports have grown so rapidly and developed so extensively during the past few years that it is now impossible for any one committee to keep thoroughly informed on all the details of all the sports, and without a knowledge of these details the committee would be incompetent to act as managers or advisers. Moreover, in our opinion the very nature of these contests precludes any committee composed of faculty members, and appointed to regulate athletics, from assuming to manage the practical affairs of the different clubs and associations. On the

other hand, few graduates can afford to give the necessary time, even if they have kept pace with the development of the subject. If they have the time to give, the chances are that they have not the requisite knowledge and will misuse their opportunity. But experience has shown that the management of the different athletic organizations is too much for the students to assume without the counsel and advice of older heads. Moreover, it should be said that the sole responsibility for the practical working of a team through the entire season ought not to fall upon the captain alone, as is usually the case.

The crying need in our colleges to-day in connection with the management of athletics is the advice and instruction of experts. The whole subject has grown beyond the capacity of faculty, students, and graduates, and if athletics are to be pursued along the same line as other branches of education, that is, with a view to attaining the highest degree of excellence, institutions must employ special instructors trained for this service, just as they employ instructors skilled in the teaching of Greek, mathematics, chemistry, and similar subjects. This is a conclusion which we would gladly avoid if we could, for it will add greatly to the difficulty and expense of keeping up an interest in athletics, especially in

the smaller schools and colleges; and just what its influence will be upon the general practice of physical training is an open question. But it is one of the natural results of a failure to adopt the intercollegiate regulations, and we see no escape from it.

If the men appointed to these positions are so fortunate as to have a college education in addition to their training as experts in physical exercises, it will add greatly to their qualifications for college work. If they also have the good sense to work through the student officials, quietly instructing them as to their duties, but keeping themselves in the background and letting those who participate in the sports have the honor and glory of victory, this quality will be highly appreciated by the students and will render the positions of the special instructors at least tenable in case of an overwhelming defeat.

The appointment of specialists in athletics will necessarily make the duties of a medical director more desirable and more onerous, as he will have the enthusiasm and inclinations of the instructor to keep in check, as well as those of the students.

The grand idea of general excellence in several sports requiring different qualifications and contributing to the harmonious development of the whole

body, which is the highest aim of all advocates of physical training and which the medical director must keep constantly in mind, will in the future be more difficult to put in practice, unless concerted efforts are made in this direction. The move taken by the Y.M.C.A. in establishing the pentathlon, or the general excellence plan, in their athletic sports, is to be highly commended and will partly make amends for their temerity in introducing competitive exercises, with their perplexing problems, into association work.

In the management of athletics we may state that inasmuch as these sports are maintained for health and physical improvement, the medical director must decide as to who is fitted to enter contests and who is not. He may also give advice as to the kind of sport that is likely to do the individual most good, and give personal talks or public lectures on the general subject of physiology and hygiene. Beyond this limit he cannot go, unless he desires to become his own executioner.

The practical management of each sport should thus devolve upon a committee, composed preferably of a recent graduate deeply interested in the sport under consideration, the special instructor or coach, and the student captain of the organization.

The committee should feel free to confer with the medical director and the committee on the regulation of athletic sports. The responsibility, however, for the plan of campaign or policy pursued must rest with the committee of which the captain of the team is a member. This would seem to be the only way to harmonize the diversified interests that are now concentrated about this great subject and to lessen the friction of what now seems to be an inevitable conflict.

CHAPTER VIII

ATHLETICS IN SECONDARY SCHOOLS

It is perhaps only natural that the great interest aroused in athletics in the universities and colleges should have extended into the preparatory or secondary schools. In the establishment of the numerous school athletic clubs, interscholastic state leagues, and national interscholastic athletic associations, with their frequent contests and enthusiastic supporters, we recognize the existence of a movement which must soon be reckoned with in considering the subject of secondary-school education. In fact, many of the problems connected with athletics which have long perplexed the college authorities are now beginning to demand the attention of school-teachers and school-superintendents.

In the secondary schools the athletic problems are made even more complicated than those in the colleges in consequence of the youthfulness of the pupils, the want of proper facilities for training, and the inability of the authorities, especially in some of the public schools and private day schools, to furnish

immediate supervision of the pupils or have any control over their exercises outside of school hours.

The recognized importance of the subject, the difficulties encountered in the way of administration, and the evils that have resulted from want of proper supervision and control of athletics in the preparatory schools have led to an increasing demand from these institutions for well-qualified teachers of physical training. Indeed, higher salaries are offered to-day for men who can take charge of the physical training and athletics in the large fitting schools than are paid to the instructors in the same line of work in many of the colleges. Inasmuch as these schools are far more numerous than the colleges, a large part of the normal work will soon have to be devoted to the training of teachers for this branch of service. Let us therefore consider briefly some of the problems that have to be met in managing athletics in the secondary schools and then see if there is any satisfactory way in which these problems may be solved.

It is exceedingly unfortunate for the cause of physical education that the terms "athletics," "physical training," and "gymnastics" are used synonymously by the general public. The original Greek word for "athlete" meant "prize fighter," and later

"one who contended for a prize." The secondary definition was made to include any one trained to contend in exercises requiring great physical agility and strength, — one who has great activity and strength, a champion. Originally a gymnast was a trainer of athletes, but later, one who taught or practiced gymnastic exercises for health, defense, or diversion. With the Greeks the term "gymnastics" included such games or exercises as running, leaping, wrestling, and throwing the discus and the javelin. The term "physical education," as defined by Webster, means "training of the bodily organs and powers with a view to the promotion of health and vigor."

Although the growth and development of these great subjects during the past few years might make them include many more topics and sub-topics with finer distinction as to their meaning, the great fundamental truth would still be that most forms of athletics and many forms of gymnastics refer to contests for prizes or to contests requiring great physical agility and strength, while physical education and most forms of gymnastics refer to the training of the bodily organs and powers with a view to the promotion of health and vigor. It is well to keep in mind these primitive definitions in

considering the responsibility of the school authorities and instructors in dealing with athletics.

As long as attendance at school is compulsory it would seem to be perfectly reasonable to exact that nothing should be done to interfere with the natural growth and development of the child, and that everything should be done to accomplish the purpose for which the child was sent to school. It is an established fact that school life does tend to retard bodily growth and development and to produce certain organic weaknesses and physical defects. It has also been shown by the extended observation of many investigators in different parts of this country and in Europe, that whatever improves the physical condition of the pupils tends to improve their mental condition, as indicated by the higher rank that such pupils have invariably attained. Carefully selected, well-regulated, systematic physical exercises have long been recognized as the best means of promoting growth and development of the body, and of correcting the defects and deformities that result from the child's attempt to adapt himself to school seats, desks, and other schoolroom environments. It is now recognized also that physical exercise furnishes the best means of renovating and invigorating the brain, through its influence upon the

respiration, circulation, and digestion. It would therefore seem that some kind of physical exercise is absolutely necessary in order to preserve the health of the child and build and develop the brain, which are the primary objects of the whole school system.

In consequence of the neglect of the elementary schools to make provision for physical exercise, many of the pupils come up to the secondary schools with drooping heads, flat chests, projecting shoulder blades, and other school-bench deformities, which must be attacked at once if they are ever to be corrected. Physical defects are so common during the early teens, and they are so easily overcome at this time, that the whole school class should be put through a daily systematic drill with a view to counteracting the evil effects due to the confinements and restrictions of schoolroom life. The best means of furnishing these necessary exercises are the ordinary calisthenics, free movements, and light gymnastics with dumb-bells, wands, and Indian clubs. Some of these exercises should be given daily in the form of drills in one or two ten-, fifteen-, or thirty-minute periods. They should be given by the regular teacher without any apology and simply as a matter of course. Moreover, the pupils who engage in the physical work required should be

given credit for it and for the results accomplished, just as they would receive credit for any other school study or exercise. One object in taking this stand is to impress upon our youth during the formative period the essential unity of mind and body, and to teach them the fallacy of neglecting one in the hope of improving the other. Another purpose for giving credit is to enable the teacher to command the attention of the pupils and present the subject with as much care and thoughtfulness as he would any other branch of instruction. If arrangements could be made for it, each pupil should have a certain amount of individual attention and instruction, in order that special faults and defects may be eradicated and lines of special development suggested. One should not insist upon the special work, however, as part of the school requirement unless it is taken as a substitute for the other exercises.

The ten- or fifteen-minute drill in the schoolroom should be supplemented by well-regulated plays and games at recess time. We say "well-regulated" plays and games, because it is of the utmost importance that the right games should be introduced at the right time and that they should be checked in case they become too violent, overheating, or exciting. These recess games should be voluntary, and in the

management of them the school-teacher should take the position of leader and adviser rather than of preceptor. Of course he should be perfectly familiar with all the games taught and should be the willing interpreter of all the rules and regulations governing them. He should encourage the weak and timid and restrain those who are too strong and overbearing. He should be the umpire in all disputes and the ready exponent of justice and fair play. Occasionally he should start impromptu contests in running, jumping, and some of the lighter forms of gymnastics and athletics. He should be the first one to recognize merit when he sees it and to call attention to the fine points and particular excellence of any one's performance. On the other hand, he should be the first to frown upon anything that looks like cheating or dishonesty, and should immediately visit his disapproval upon any young athlete who gains an advantage by any kind of unfairness. By supervising and conducting games in this way the teacher not only has an admirable opportunity to study the character of his pupils and thus acquire a knowledge which will prove valuable in the schoolroom but also a chance to instill into their minds in connection with their athletic sports the importance of such qualities as promptness,

obedience, alertness, energy, courage, perseverance, and justice.

The physical work which we have already outlined should be carried on under the direction of the supervisor or director of physical training as an essential part of the general school curriculum. The question now arises, Should the school authorities carry the matter of physical training farther and undertake to provide instruction for special athletes, assuming the direction and management of interscholastic contests and athletic games?

So long as competitive athletics are made general in a school, and the competition is among its own members and not between them and other schools, there would seem to be no good reason why the pupils should not be taught how to run, row, jump, fence, box, wrestle, and swim, and to play baseball, football, and other antagonistic games. Indeed, there are many good reasons why all the pupils should be taught these exercises and be encouraged to test themselves by competing with others in trials of strength, skill, and endurance. In order to have these exercises well taught, and the contests well managed, they should be under the direct supervision of the director of physical training and should be supported by the school authorities.

While keeping general control of the athletic work, the tactful director would of course avail himself of the services of his best pupils as captains, leaders, and assistants. Under this arrangement a sense of proportion could be maintained between the physical and the mental work, and athletics could be made to harmonize with the general school programme. The readiness of school authorities to provide for this extra instruction and supervision would depend upon the willingness of the people, or certain benevolently disposed individuals, to provide the money for it. A great deal may be done toward making certain forms of athletics self-supporting by having them interesting and attractive to the public, but in this also lies a danger.

It is a familiar phase of human nature that when a group of boys has conquered one school or community they immediately desire more schools or communities to conquer. It is an appetite that grows by what it feeds upon, and is unfortunately not confined to boys or men individually but sometimes possesses whole countries and nations. When the interest in competitive athletics once passes the boundaries of the school yard or playground there is simply no limit to the territory into which it may extend. But this great expansion and extent

of interest, in our opinion, altogether changes the relation of the school authorities and the director of physical training to the whole subject. So long as the competitive exercises are confined to the school limits and made a part of the regular school programme in the manner shown, the school authorities may well consider themselves responsible for the management of these exercises and the results that are derived from them; but when one school enters into competition with another, the interest becomes so intensified, the training required so severe, and the risks run so great, to say nothing of the demoralizing effects upon the rest of the school programme, that no school board or school officials alone should be held responsible for the results. The responsibility should be assumed mutually by the parents, school authorities, graduates, and the boys themselves.

Having been taught practical lessons in self-government through the school games of the grammar grades, the pupils of the higher schools should be encouraged to try to manage their own sports and athletic contests. This will be difficult to do at first, and many mistakes and blunders will necessarily be made. If, however, each officer appointed will make a report of his various duties at the end of the school year, carefully recording successes, failures, and other

experiences, in a few years it will be possible to outline for the school a policy in the government of its athletic affairs which will be very valuable. In order that more stability may be given to the school athletic organizations, since the students are necessarily a fluctuating body, an athletic committee should be appointed to have general supervision of such matters and keep the officers up to their duties. This committee might well be composed of three former pupils of the school who have had previous experience on some of the school teams, an equal number of undergraduates, the director of the gymnasium or supervisor of physical training, some member of the teaching force, and a member of the governing boards. This committee should draw up a code of rules and regulations governing the eligibility of players, the time, place, and conduct of games, the duties of officers, and the general management of athletic affairs. Where there are to be interscholastic contests this committee, or certain members of it, should meet the members of similar committees from the schools comprising the athletic league or association, and draw up regulations governing interscholastic athletic meetings. These regulations should be published and made accessible to every schoolboy in the land who may wish to

become familiar with them. As a basis for the establishment of some such regulations, the advantages of athletics over other forms of exercise and training should be frankly pointed out and acknowledged. The evils and dangers with which the practice of these exciting pastimes are almost necessarily accompanied should also be considered, and every possible arrangement made to mitigate them.

But what are some of the benefits to be derived from athletic contests in the secondary schools, and what are some of the evils to be contended with? Under such a scheme as we have outlined, the pupils will have a certain amount of all-round formal exercise in various kinds of calisthenics, gymnastics, and athletics. These formal exercises are intended gradually to train, strengthen, and develop the different parts and organs of the body, and are as essential to a scheme of physical education as reading, writing, arithmetic, and other fundamental studies are to a scheme of mental education. They furnish the best kind of preparatory training for the various kinds of athletic contests, as is proved by the practice of professional athletes and the college ball teams, track teams, and boat crews. Having developed the elements of power through the practice of formal exercises, they should be

further developed, tested, and applied through athletic contests and games. Here is where the boy first finds himself, and becomes acquainted with his own powers as distinguished from those of some other boy. In these contests he receives his first great stimulus toward self-activity and self-expression. They pull him out, as it were, and incite him to make greater and greater efforts.

Formal exercises are given to youth for results which are to be realized largely in the future. Athletic contests are objects of immediate interest and furnish a definite purpose for action. If wisely chosen they also furnish an immediate incentive for the cultivation of special powers and the improvement of special weaknesses and defects. In team play, especially in the highly organized games, admirable opportunities are afforded for developing many excellent traits of character. In formal exercises one movement follows another in regular sequence, through lines which have been carefully worked out beforehand. In games no two plays or combination of plays are exactly alike. One can never know just what his opponent is going to do, yet what one's opponent does changes the nature and direction of the game. Each player must decide when and how to act in each exigency that arises,

and he must execute his decision promptly and energetically. Alertness, quick perception, forced and prolonged attention, great self-control, self-direction, and even self-sacrifice, are often called for and correspondingly developed. In an admirable address entitled "Physical Training as a Factor in Character Building," Inspector Hughes has well said:

No other school work defines energy of character more than athletic games. By playing games boys learn to bear defeat bravely and to work harder for victory to-morrow because it has not been won to-day. Final triumph won by persistent practice and patient effort for success fills the young character with the faith and hope that are so essential in the life struggle of later years. The athletic playground is the best place for developing the consciousness of individual power and responsibility, and forming apperceptive centers in the mind, around which may be gathered ideas of the highest social import, — coöperation, or the organic unity of the race. The boy who is a member of a cricket, lacrosse, baseball, or football team learns in the most definite way that the more completely he develops his powers and the more perfectly he can perform his part, the more certain his team is to win. He learns, too, that one weak player weakens the whole team. Each member thus learns more surely than he could in any other way the lesson of individual responsibility, and the value of individual power and individual effort. He learns, too, the higher lesson of unity or coöperation as the basis of complete success. Victory results from the combined efforts of thoroughly trained individuals who are working heartily for the accomplishment of a common purpose. Playing games governed by well-defined rules trains character by developing a spirit of hearty submission to law.

The high mental and moral qualities as well as the physical stamina acquired through the practice of competitive games have of late years attracted the attention of our great financiers and men of affairs, and many of the college men who distinguished themselves in athletics have been invited to take positions of great trust and responsibility. The knowledge of men, the energy of character, and the executive ability acquired through the practice and management of athletics is of the greatest value to young men who wish to prepare themselves for a business career. We remember hearing the superintendent of schools in a neighboring city say in a public address that his son tried for a week to get a position in New York City upon the strength of being a Harvard graduate. Finally he happened to mention that he was also stroke oar of his class crew. This, or rather the qualities supposed to belong to a man who could win and hold by hard work such a trying place, secured him his position in the great city. Considering that the great majority of school and college youths are fitting themselves for a business career, where push, energy, courage, coolness, and a rapid and responsible exercise of judgment under trying circumstances count for so much, it would seem that the vigorous training

acquired through judicious practice of athletics would be almost invaluable.

Most of the objections which have been made to athletics have arisen from their excessive rather than from their legitimate use. There are some well-founded objections which are worth considering. No one will deny that it is a good thing for a boy to learn to run, jump, row, swim, and play ball, and to practice these valuable exercises within reasonable limits; but when they become so all-absorbing as to demand most of his time, energy, and attention, they defeat the very object of their introduction into our schools and colleges. Those engaged in making physical examinations have observed the tendency of certain forms of athletics to produce certain mental and physical results, such as increased energy and activity, sometimes engendering a sort of physical restlessness, and increasing the muscular strength, as well as the length and girth of trunk and limbs, and the strength and capacity of heart, lungs, stomach, and brain. When these same exercises are overdone and the athlete is thereby overtrained, his extreme mental activity lapses into mental dullness or into nervous irritability and lack of control, he loses in weight, and his muscles cease to develop. Overtraining may also cause the heart to become

enlarged or unduly dilated, the lungs to become congested, and the stomach to refuse to do its work, thus bringing the man to the verge of a general collapse.

The physical and mental condition that follows what may be called an acute attack of overtraining may result from activity prolonged over a term of years, in which case the injury is more lasting. It is a familiar anatomical fact that all organs and parts of the body develop in proportion to their use. Thus the oarsman increases the size and strength of his legs and back, and the gymnast the muscle and breadth of his arms and chest. After this special development has been carried to a certain extent, the parts that have been robbed of their just share of nutriment in order to sustain the increased life of some other part refuse to work unless they can have their proper supply of food. In this way some part that gives out repeatedly in a supreme effort becomes permanently weakened.

Given a hundred boys who are trying to outrun, outjump, or outrow each other, and those boys will come to the front whose peculiar development most readily adapts itself to the special sport in which they excel. At least ninety per cent of the boys, through lack of the particular development required,

will fail to reach the highest achievement. If, however, the rivalry is intense and the ninety per cent keep on trying, a large portion of these will fall out in the struggle and a few will surely injure themselves. There would be no honor in making a record in any athletic sport or in becoming a member of a victorious athletic team if it were possible for all the boys in the school to do the same thing. No distinction would be gained by doing what any one might do. Where the great desire is to break a record, win a prize, or gain a championship, it is perfectly natural that an ambitious boy, for the sake of his own advancement, should put forth every effort to accomplish the end in view; and when it is considered that the attainment of such distinction would bring honor to family and friends, to class, society, and school, and that the player is urged on by coaches, trainers, and admiring comrades, it will be seen that a tremendous pressure is behind his best efforts. Under these circumstances it is not surprising that some boys overdo and are injured.

This overdoing by physical exertion is, as already intimated, far more likely to occur in the case of youths of our secondary schools, because of their immaturity. It is a fact well known to anatomists

that the important bones of the skeleton do not consolidate until between the ages of eighteen and twenty-five. Until this consolidation takes place the different parts of the framework are susceptible of great improvement under judicious exercise and training. But the same bones are just as susceptible of injury or of being deformed if the exercises and training are not judicious. Specializing in athletics at too early an age tends to produce skeletal defects and deformities, which are easily recognized and which often call for corrective treatment to prevent them from becoming permanent. In early youth the ordinary sprains and injuries that occur in the practice of athletics are not of such serious import, because one easily recovers from them. The most serious injuries which are likely to occur when athletics are overdone are those which affect the vital organs. The heart is under a greater strain than any other organ during the period of puberty and throughout adolescence to adult age. The following table shows the weight of the heart at different ages:

Age	Weight
7–14	4.25 oz.
14–20	7.61
20–30	10.06
30–40	11.36

During the period of puberty the heart actually doubles in size. From this period until the age of eighteen the development of the heart is less rapid and frequently does not keep pace with the growth of the trunk and limbs. Its greatest progressive development takes place between the ages of eighteen and twenty-five.

The following table shows the weight of the lungs at different ages:

Age	Weight
7–14	20.52 oz.
14–20	40.07
20–30	62.43
30–40	62.76

The liver, kidneys, and spleen increase proportionately in weight, and consequently in functional power, during the same periods. If extraordinary demands are made upon the heart and lungs before the age of eighteen, as is the case in long-distance running or rowing, too frequent trials in short-distance running, prolonged and persistent attempts at jumping, pole vaulting, wrestling, boxing, football, basket-ball, or any kind of violent athletic contest, these important organs are likely to be injured from overwork. The heart will become weakened and dilated and more or less violent palpitation will occur, the breathing will

be short and difficult, and often accompanied by pulmonary hemorrhage, and the individual will be incapacitated for any prolonged muscular effort. The liver and kidneys may also be impaired in their functional capacity if greatly overworked before the age of eighteen.

But so great is the recuperative power of nature, especially in youth, that the injury to even these important organs may be repaired if the impairment is discovered in time and the cause of the trouble removed. If, on the other hand, the ambitious schoolboy has more sand than sense and still continues his violent efforts in spite of the warning symptoms, he will become incapacitated not only for all college athletics but for his life work. This sudden breakdown is much more likely to take place if the boy is at the same time ambitious to stand high in his studies or to win social distinction. In fact, it is almost always athletics plus some other strain or draft upon the heart or nervous system that occasions the collapse. The treatment for these cases, however, when taken in time, is very simple. It consists in complete cessation from all violent efforts for from six to twelve months, complete rest in a recumbent position for one or two hours in the middle of the day, and indulgence in only

such exercises as can be carefully regulated and controlled.

In addition to the objections raised to school athletics from the physical standpoint it is necessary to consider certain objections which are often brought against them because of their moral effects. In the opinion of many the prominence now given to athletics by the press and public, the praise and adulation bestowed upon individual athletes by schools and colleges, the commendation of friends and the worship of comrades, the celebrations and the banquets are having a demoralizing influence upon a large class of our youthful population. A young man whose good work in the class room has never attracted attention and whose social charms and accomplishments have never brought him into notice suddenly finds himself raised to distinction by an athletic victory. He feels his own importance for the first time in his life, and with this sense of importance comes an increasing appreciation of the method by which he has risen into prominence. Henceforth his presence may be required in the recitation room but his mind and thoughts will be occupied with the scenes of his ephemeral triumphs. It is claimed, too, that athletic contests not only fascinate the participants but allure hundreds of non-

athletic youths from their studies and thus interfere with the serious intellectual work of the schools; that the protestations of the instructors are of no avail, for on the subject of sports the whole country seems to be against them; and that, indeed, many teachers have felt obliged to ally themselves with this athletic movement in order to have any influence over their pupils.

Some of these objections may be well founded but others are not. The newspaper prominence given to schoolboy athletics has been greatly modified within the past few years. At the close of a school season there are published in the newspapers many more pictures of schoolboy and schoolgirl orators, poets, and class-day officials than of schoolboy athletes. The enthusiastic admiration of physical vigor and athletic prowess and agility is perfectly natural to youth, because it is youth's own province. All the glory of this kind that is ever attained must necessarily be attained in youth, because adult age brings other duties and responsibilities and a growing disposition to use the mind more and the body less.

In our opinion a much greater evil than any that has been mentioned in connection with school and college athletics is the tendency to magnify the

importance of victory and to be indifferent to the means by which it is frequently attained. A victory won by hard work and faithful training — which is only another term for correct habits of living — is deserving of the highest approbation. It indicates better blood, better muscles, better brain, better everything that is worthy of emulation and perpetuation, whether possessed by our own teams or their opponents. But attempts to prevent the triumph of these good qualities through trickery and fraud should meet the condemnation of all lovers of manly sport and manly virtue.

The pernicious custom of betting is partly responsible for the desire to win at all hazards, and although there is very little betting among the supporters of the schoolboy athletes there is enough of it among our college students to give a peculiar coloring to all forms of amateur sports. The acknowledgment of a foul or a fault on the part of a player is not yet considered a point of honor, and any little trick or deception that may be used to help win the game is quite readily overlooked or forgiven by the supporters of the victorious team. It is well known that in baseball much of the coaching that is given to the men running bases, and the cheering and music that are supposed to keep up the courage of the favored

team, are really given to disconcert the opposing players. This line of conduct has nothing to commend it and greatly detracts from the interest in the game. The base runner should be sufficiently alert to find his way unaided around the bases, and the cheering should be reserved for the performance of work well done. To keep up a continuous volley of cheering, shouting, and catcalling throughout the progress of an athletic contest, for the purpose of giving courage to one's own team and of striking terror to the hearts of the opponents, is an empty and silly custom. It can be compared only to the beating of the tom-tom in early Indian warfare to fire the hearts of the braves, or to the blaring of trumpets, clanging of gongs, and beating of drums and other ear-splitting instruments with which the Chinese soldiers formerly hoped to frighten away their adversaries.

Another evil in connection with secondary-school athletics is the readiness on the part of some of the school authorities to use the athletic teams as a means of advertising the school. This is an evil, however, that pertains rather more to the private than to the public schools. To have a victorious baseball nine or football team is thought to reflect credit upon a school and attract the attention of

parents who wish their sons to have a good physical education and be made strong and vigorous but when it is considered that in most schools the athletic teams represent only those composing them, that the members of these teams usually have good physiques when they enter the school, and that little or nothing is done to improve the physical condition of the great majority of the pupils who really need it, the hollowness and insincerity of the whole affair become painfully apparent, at least to the teachers of physical training. When the desire and enthusiasm for victory are so strong as to lead an institution to import athletes for the purpose of securing winning teams in baseball, football, and other games the sports have lost their significance, and the whole transaction reflects nothing but discredit upon all who were instrumental in bringing it about. The moral effect upon the pupils and the school community would be much better if the whole athletic team were hired outright to play for their amusement; for this method of securing athletes would be at least honest, whereas the methods that are sometimes used to draw athletes to a school and pass them off as bona fide students are thoroughly dishonest and are always followed by a train of evil consequences that are ruinous to amateur sport.

Happily, through the vigorous method pursued during the past dozen years to check this evil, it is now somewhat abated, but strenuous efforts would still seem to be necessary to demonstrate to some of our youths the utter uselessness of victories secured through other means than honest efforts where the best men win.

In conclusion, it seems to us that the most desirable thing to do is to get all athletics out of school and college politics and treat them as an essential part of a complete system of physical training. This implies at once a recognition of their importance and a consideration of the good points to be preserved and the evils to be eradicated. It also implies the hearty coöperation of the school authorities, school graduates, and the parents and pupils in an attempt to regulate and control them.

All sorts of athletic contests, indoor and outdoor, may easily be arranged for all classes of pupils, so that every one in the school may experience the stimulating effect of taking part in some kind of physical competition. The chief aim of the director of such sports should be to see that all of the contestants are divided in groups and that each group has, as far as can be determined without a trial, an equal number of strong and weak boys.

With a determination on the part of those most interested in the welfare of our youths that athletic sports shall be rightly managed, much good will result from the practice of these invigorating exercises. On the other hand, if they are left wholly to the management of inexperienced youths, or to men who wish to exploit them for their own advancement or to cater to the popular love of excitement and amusement for a pecuniary consideration, the good which results will certainly be mixed with evils which will be detrimental not only to those engaging in athletics but also to the cause of general education in our schools and colleges. Will our secondary-school authorities have the good sense to realize that athletics cannot be eliminated from school life, and unite with others in trying to check the abuses and direct the uses of this important adjunct in education? We cannot help thinking that they will.

CHAPTER IX

MILITARY DRILL IN THE PUBLIC SCHOOLS

Long before the Civil War many academies in the southern states were pursuing the European plan of devoting special attention to military science. At the outbreak of the Rebellion, while the North was obliged to look for its officers to the small nucleus graduated from West Point, the South had, in addition, the well-trained students of the state academies to command its regiments. In the opinion of military men the early successes of the southern army were largely due to this fact.

Many of our northern citizens were so much impressed with the utter lack of military training on the part of our educated young men at the beginning of the war that efforts were made as early as December, 1861, to introduce infantry drills in the public schools. The matter was acted upon by the boards of education in New York and other cities, and referred by them to special committees. In the January following, Governors Andrew and Morgan recommended legislative action on the subject.

In 1863 military drill was established in the Boston schools. At the termination of the war it was considered desirable by the general government that some of the army officers not otherwise employed should be detailed to teach military science to the students of such colleges as desired it, so that educated men might have a better knowledge of military discipline and drill than former graduates had received in these institutions.

Many of our schools and colleges applied to the government for officers and began the experiment of making military drill a part of the regular curriculum. How far this experiment has succeeded from the military point of view we must leave those who are interested in our volunteer militia to answer. Our purpose here is simply to call attention to the fact that the primary object of establishing the drill in our schools and colleges was a professional one, — that is, to give instruction in military tactics to educated young men in order that they might be of service to the country or community in case of an emergency. The war not only gave an incentive to the practice of military drill but it also furnished a great stimulus to all forms of physical exercise and especially to athletic contests and games.

As the occasion which gave rise to a call to arms became more remote and the real object of the drill lost its significance, those who advocated its maintenance in the schools claimed for it superior advantages as a physical exercise. In the city of Boston the committees to whom the subject of military drill in schools had been referred placed considerable stress upon this point. We here quote a few lines from their published reports as compiled by the principals of the public Latin and high schools for boys. In 1873 the committee reported as follows:

> Your committee believe that the drill, as now carried on, proves to be not only the *best* for physical exercise for these schools, but that at the same time it inculcates a more manly spirit in the boys, invigorates their intellects, and makes them more graceful and gentlemanly in their bearing.

In the report for 1874 there is a similar statement, while the committee of 1875 further urged the continuance of military drill:

> We trust that the drills will be kept up, believing that committees having them in charge will see that no form of gymnastics could be substituted from which the boys would derive such benefit.

In 1880 the committee again approved:

> The establishment of the military drill is one of the few provisions made by the school board for the physical training of the pupils under its charge, and no one who has observed the soldierly bearing of the members of our school battalions can have any

doubt of its value as a means of securing a full and symmetrical development of the physique.

Notwithstanding the fact that half of the members of these committees were physicians, one may venture to differ with them absolutely as to their conclusions concerning the physical effects of the military drill upon boys. In order that we may approach the discussion of this subject more intelligently, let us inquire briefly into the physiology of exercise, and consider some of the facts which observation and experience have determined.

Exercise in its simplest sense may be defined as "muscular movement produced by muscular contraction." According to the physiologists,

the property of contractility is inherent in the muscular substance, but in normal life the manifestation of this property is immediately determined through the influence of the nervous system. . . .

A nervous impulse originating at the brain or spinal column travels along the nerves to their terminal expansions in the muscular fibers; on its arrival at the muscular fibers, the nervous impulse is converted into a muscle-impulse. . . . Between the reception of the nervous impulse and the initiation of the visible contractile movement an interval elapses known as the "latent period," which (according to Helmholtz) is probably occupied by molecular changes in the fiber preparatory to its alteration in form. At the close of the latent period the muscle-impulse is succeeded by a wave of contraction. . . . The contraction of the

individual fibers produces changes in the form of the entire muscle, shortening the distance between its two extremities by increasing its thickness and slightly reducing its bulk.

In the voluntary muscles (according to Weber) each contraction is compound in character, being composed of a series of rapid contractions, due to an equally rapid succession of nerve-impulses.

During muscular contractions certain chemical changes take place in the muscle substance, although the exact nature of the metamorphosis has not been determined. It is known, however, that the blood escaping from muscles in action is much darker than the venous blood of muscles in repose, and that it contains a much greater proportion of carbonic acid. It is also known that a greater amount of oxygen is absorbed by the muscles during the period of contraction, and Gaskell's experiments have demonstrated that the flow of blood through muscles is increased at the time of their shortening.

Thus we see that the simplest muscular movements involve a molecular change at the nerve center in which the movement originates, in the nerve fiber that transmits the impulse, in the muscle fibers that contract, and in the blood vessels that dilate in response to the stimulation. The experimental researches on a single muscle in the physiological laboratory have given us an epitome of what

should take place throughout the system at large in order to realize the best results from exercise.

There must be consecutive action of, and harmonious relation between, the nervous, muscular, and vascular systems in every effort to improve the physique and render the individual energetic, healthy, and strong. How to attain this threefold result is the problem that the instructor of physical training has before him.

If you lift your arm by flexing it at the elbow, the arm is raised because the biceps muscle contracts, but the fibers are not hard and tense and there is little evidence of an increased circulation. This would be termed a movement, — almost a passive movement, — and is what might be first advised to restore efficiency to the arm of a paralytic or to preserve a single group of muscles from atrophy. It is the basis of the "movement cure" as founded by Ling, of Sweden.

If you contract the muscles of the arm rapidly and energetically, you give exercise to nerve centers and nerve fibers, but the muscles are not efficiently used and the blood supply is not much augmented. By pursuing this method the nervous system may sometimes be improved and the muscles made responsive, but activity will be attained at the expense

of endurance. This is the basis of the Delsarte[1] system of physical culture now so popular in the schools of elocution.

Now grasp a heavy dumb-bell or weight in the hand and elevate it slowly to the shoulder. In so doing you bring about an energetic action of the flexor muscles, but the nervous system is not especially active, and though the blood vessels of the arm are gorged with blood the circulation is not much improved. By pursuing this method the muscles may be increased in size and strength, but the individual, though apparently strong, will lack heart and lung power, and be constitutionally weak. This is the result of the "heavy weight" system as formerly practiced and advocated by Dr. Winship.

Now if the arm is alternately contracted and relaxed while using a lighter weight, the blood in the arteries is pushed forward into the veins and through the veins into the heart. When it arrives at the heart, that organ is stimulated to contract with greater energy, and a proportionally greater amount of blood is sent back to the arm. By following this method the blood vessels in the parts

[1] The Delsarte system, so called, was later made to embrace "extending and relaxing exercises," and finally all forms and methods of physical exercise attributed in this country to Delsarte were repudiated by his daughter.

used may be greatly increased in size and capacity, but if many muscles are called into play at the same time, the brain and central nerve system will lack their proper share of blood, and power to continue the effort for any length of time will be wanting. This, in a word, is the chief defect in the system of "light gymnastics" advocated so earnestly some twenty years ago by the late Dr. Dio Lewis.

These four methods of exercise, when elaborated and applied to the whole body, represent, we believe, the fundamental principles of four great systems of physical training, — each method being admirably adapted to meet the special wants of certain individuals, but wholly unreliable when applied indiscriminately to all classes in a community, and in some cases followed by fatal consequences.

To select at once a system of exercise that will do no harm to any one and yet be beneficial to all is a difficult task; yet we shall come nearer to doing the greatest good to the greatest number if we follow what may be termed the "physiological method."[1] Our principal objection to military drill as a physical exercise is that it does not to any extent meet the physiological demands of the body. In other

[1] Consult pp. 147–151 for the essential requisites of good exercise as based on the physiological method.

words, it is not of sufficient interest as a means of physical development to arouse any moral earnestness and enthusiasm on the part of the boys. The exercise of the manual is not performed with sufficient force and rapidity to insure the energetic contraction of the muscles employed. It is essentially a one-sided exercise, bringing into excessive action the elevators of the right scapula, the deltoid, biceps, flexors of the forearm, wrist, and fingers of the right side; while the other muscles, excepting the legs on parade days, do not get sufficient employment to keep them in good condition. It does not increase the respiration and quicken the circulation to a sufficient extent to secure the constitutional benefits that should accrue from exercise.

During the drill the clothing is buttoned close around the chest and natural respiration is hindered. The muscles are not alternately contracted and relaxed but are tetanized, or kept in a state of prolonged tension. This, as we have seen, not only impairs the tone of the muscles used, but also puts an additional strain upon the brain and nervous system at a time when both should be as much relieved as possible. Finally, the mere exercise of the manual of arms does not give sufficient breadth and scope of movement to secure the coöperation of

the muscles, and as a training for the central nerve system it is of little or no value.

Coolness, courage, presence of mind, and that rapid and responsible exercise of judgment in emergencies, so valuable to the man of business as well as to the soldier, are not developed by the drill itself, although we admit that other moral attributes — such as obedience, patience, fortitude, and forbearance — may be brought to a high degree of perfection. The community at large has long entertained the idea that there is something about military drill that makes young men erect, or, as the committee previously mentioned were pleased to express it, "makes them more graceful and gentlemanly in their bearing."

To take from the drill one of the best attributes that have commended it to parents and teachers is a matter of regret, but unless we have been misled in our observations there is nothing in the drill itself that tends to make one erect or graceful. On the other hand, we are prepared to maintain that it tends to make the boy stiff and angular in his movements and to give him drooping and rounded shoulders.

This view was long since brought to the attention of military authorities, and a set of calisthenic exercises, or free gymnastics, designed to correct this tendency has been incorporated into all the treatises

on military tactics. We refer to what is familiarly known as the "setting-up" drill. Upton, in his *New System of Infantry Tactics*, says, "As the importance of 'setting up' cannot be overestimated, the exercises must be often recurred to, and all soldiers will be frequently practiced therein." Notwithstanding this recommendation, we have yet to learn of a single military school in this country, the national school at West Point excepted, where these exercises are practiced assiduously. They are irksome and unpopular, like all corrective measures, and are consequently never insisted upon.

There is another method, commonly known as "tailorizing," by which youthful soldiers may easily acquire a full chest, square shoulders, and a straight back. The results may not be as enduring, but they help out on parade day and undoubtedly contribute something to the "manly bearing" that is so often spoken of. The moral is, Do not waste your admiration over the military figure until you see it with its coat off.

In reference to the gracefulness that is thought to characterize the movements of cadets, we can only say it is not the outcome of drilling and marching. The soldier is trained to square corners, straight platoons, and angular movements; curves

and embellishments are not encouraged in speech or in action. If you would account for the graceful poise of our national cadets, you should visit West Point in summer and see them from one to two hours a day in charge of the dancing master.

Having considered at some length what the drill does *not* do for boys, we invite attention to a brief consideration of some of the things that it does do. Here let us forestall any impression that our previous remarks on this subject may have left, and state that we think military drill, as conducted in the schools, is not injurious to a strong, full-grown, healthy boy, except in a negative way,—that is, it does not furnish him the physical training he needs for the maintenance of vigorous health and the acquisition of a complete or symmetrical development; but those who have had the opportunity of examining schoolboys or of looking over their measurements or photographs will bear us out in saying that the strong and well-developed boys are largely in the minority.

The pupils attending our public and private schools represent nearly every phase and condition in life. Some are well nurtured, others are not; some have favorable hygienic surroundings at home, others are subjected to unhealthy influences. All

bear the stamp of a good or bad inheritance, and the strong and weak points of the parents show themselves in the physique as readily as they do in mental characteristics. As no two minds are alike, so no two bodies are alike; but growing out of this great diversity of shapes and sizes there is a figure around which nature tends to range those of a certain age, height, or weight, according as either is taken for the standard. This is termed the "mean" or "typical boy" for a given age, height, and size. Any marked divergence from this standard is readily detected by a casual observer.

Our attention was long since called to what we think may be termed the prevailing weaknesses or defects in the schoolboy's and student's physique. These are a drooping of the head, flatness of the chest, narrowness of the waist, and an exaggeration of the normal or physiological curves of the spine; and we might add to this number — though it is not quite so common in boys as in girls — lateral curvature of the spine. These defects are so apparent that it does not take a practiced eye to detect them. They immediately attract the attention of any one who examines the figures.

The drooping of the head and flatness of the chest may be accounted for by the increased prevalence of

myopia, tightness of clothing, and the pressure of the school desk or table on the lower ribs and sternum. The hollowness in the back is partly due to the fact that it is a compensating curve, but probably in larger part it is to be attributed to the weakness of the trapezii, rhomboidei, serrati, and latissimus dorsi muscles. The smallness of the waist is undoubtedly largely due to inheritance and to the fact that the youths of the present day make very little use of the muscles of the waist and loins. Lateral curvature of the spine may be caused in many ways, —by defective seats, bad positions in writing and drawing, standing for a long time on one foot, carrying weights, or using one arm more than another.

Personally, we do not put particular stress upon these malformations. If they are discovered in time nearly all of them can be corrected by judicious exercise. If allowed to increase, however, they invariably lead to spinal disease or to some functional disturbance of the heart, stomach, or lungs, followed sooner or later by structural changes in these important organs. Whatever the original cause of these physical defects may be, the immediate cause is a weakness of the supporting muscles.

After the body has once acquired a bias in the wrong direction, many exercises otherwise beneficial

are likely to be injurious. Among this number are horseback riding, rowing, lawn tennis, and military drill. To show how the last-named exercise may prove injurious to imperfectly developed boys, we would call attention to the elastic nature of muscular tissue by quoting extracts from the experimental researches on this subject described by Rosenthal in his admirable treatise on *Muscles and Nerves.*

A muscle dissected from the body is easily extended by a weight, and is extended in proportion as the weight attached is heavier. . . . The law of elasticity for inorganic bodies is: "The tension is directly proportionate to the length of the body extended and to the amount of the extending weights; and it is also proportionate in inverse ratio to the diameter of the extended body." . . .

It has been found, however, that soft organic bodies, like muscles, are capable of far greater extension than are rigid, inorganic bodies of equal length and diameter and under the application of equal weight. But the organic body also exhibits another peculiarity.

If a weight is attached to a steel wire or some other similar body, the latter extends and retains its new length so long as the weight acts upon it; but as soon as the weight is removed the steel resumes its original length. It is not so in the case of organic bodies. When the weight is removed from an organic body it immediately becomes shorter, but does not entirely revert to its original length; it attains the latter very gradually and in the course of many hours. This phenomenon is known as the gradual extension of organic bodies. . . .

Muscle, in common with all soft bodies, exhibits another variation from the bearing of rigid bodies. That is, muscles are comparatively more extensible by light than by heavy weights. For

instance, if the extension of a muscle when carrying ten grams is five millimeters, when carrying a weight of twenty grams it is not ten millimeters but only eight; when carrying thirty grams it is only ten millimeters, and so on.

Another striking fact in connection with the physiology of the muscles has been brought out by the experiments of Weber. He has proven conclusively that muscle is extended farther by the same weight when it is in a state of activity than when it is quiescent. Here again we have the experiments of the physiological laboratory confirming the facts that have been brought under frequent observation in the gymnasium. We can now readily understand how carrying the head forward would soon extend the muscles of the neck, or how carrying a gun, though a light one, with the same arm for any length of time would gradually extend the muscles and elongate the arm, droop the shoulder, and crook the spine. This is, in fact, what military drill tends to do in all cases, and what it invariably does do when the boy is tall and slender, or the muscles weak and flabby, and there is no effort made to correct this tendency.

If it be deemed advisable to make military drill a department of school instruction, we see no reason why a system of corrective exercises cannot be

introduced as an accompaniment. If, on the other hand, military discipline alone is required, this may easily be applied to a system of class gymnastics or free exercises, as shown in the schools of Germany. After taking the most favorable view possible of military drill as a physical exercise, we are led to conclude that its constrained positions and closely localized movements do not afford the essential requisites for developing the muscles and improving the respiration and circulation, thereby improving the general health and condition of the system. We must further conclude that in the case of any malformation, local weakness, or constitutional debility, the drill tends, by its strain upon the nerves and prolonged tension on the muscles, to increase the defects rather than to relieve them.

Finally, if the ultimate object of the drill is to prepare young men for the life and duties of a soldier, we are forced to conclude that the drill itself is still defective as a means of developing the chief requisites for men in that profession. This defect is recognized by the great military nations of Europe, which give all the recruits from three to twelve months' gymnastic training to develop them as *men*, before they are expected to conform to the requirements of the soldier.

CHAPTER X

PHYSICAL CULTURE IN ELEMENTARY SCHOOLS

After many years of experimenting and investigating, we are just beginning to learn something about the laws that govern the growth and development of children. The process of physical measurements which has been carried on in this country and in England during the past twenty years is beginning to yield us data that will best determine the nature and the amount of exercise a child should have at a certain age. To certain of the facts determined by systematic measurements some detailed consideration must be given.

As no facts concerning the growth of children in America have yet been collected on a large scale, no apologies are needed for quoting extensively from the Report of the Anthropometric Committee of the British Association for the Advancement of Science, since identity of race in the two countries warrants the supposition of a like showing in America.

The average length of male infants is 19.52 inches, and of females 19.32 inches. The average

weight of naked male infants is 7.12 pounds, and of females 6.94 pounds. The range of height between the tallest and shortest male infants is ten inches, and that between the tallest and shortest female infants about two inches less. This range in the variation of height constantly increases in boys, until the age of fifteen years when it is fully twenty-seven inches.

When we inquire into the growth and development of the parts in which this tremendous increase in range of variation occurs, we find it to be largely due to the growth of the lower extremities. The head changes less in its size than any other part of the body, being 4.37 inches in height at birth, 8.07 inches at ten years, and only 8.97 inches at forty years of age. The growth of the neck is nearly the same as that of the head, but is less than that of the trunk. At birth the height of the neck is about one inch; after adolescence its length is about two inches. The trunk — consisting of the part from the top of the clavicle to the bottom of the pelvis — increases in length with greater rapidity than do the head and neck. In fact, the growth is greater the farther the parts are from the summit of the head. Thus, while the measurements of the head and neck are only doubled, those of the trunk

are tripled, and those of the lower extremities are more than quadrupled. The diameters of the trunk, with respect to width, grow in nearly the same ratio as does the length: they triple from birth to the period of full development.

At the age of six or seven years the diameters at the shoulders, the chest, and the hips at the trochanters are doubled. The diameters of the trunk with respect to thickness grow less rapidly. The diameter of the chest from front to back becomes doubled only towards the age of puberty, and from birth it grows only in the ratio of 1 to 2.36. The circumference of the trunk grows in almost the same proportion as the height and transverse diameters.

At the age of four or five years the arm, not including the hand, has doubled its original length; at the age of thirteen or fourteen it has tripled; and at the period of full development it has quadrupled its length at birth. The hand develops less rapidly. Its length between the ages of five and seven years is double, and at adult age it is triple that at birth. The forearm is the part which increases most sensibly in length; in the newborn infant it measures about two and one-quarter inches, and in the adult nine and one-half inches, the growth

being in the ratio of 1 to 4.26. The upper arm measures at birth three and one-half inches, and in the adult thirteen inches; these figures are in the ratio of 1 to 3.78. The circumference at the biceps and at the elbow increases at nearly the same ratio, but more rapidly, than the hand; that is, from 1 to 2.75 nearly.

The lower extremities, including the thigh, leg, and foot, as has already been observed, develop much more rapidly and in greater relative proportions than other parts of the body. Measuring from the fork to the sole of the foot, the lower limbs double their length before the third year; at twelve years they are four times and at twenty years five times their original length. The thigh, leg, and foot, however, do not increase in the same proportion. The length of the thigh, measuring from the fork to the kneecap, is one and three-quarters inches in the newborn child, and nearly thirteen inches in the fully developed man. These numbers are in the ratio of 1 to 17.31, and this portion of the limb acquires seven times its primitive length, an increase much greater than that which takes place in any other part of the body. The length of thigh varies greatly in different individuals, and to this difference the variation in height is largely due. The length

of the leg, measuring from the lower edge of the patella to the inner malleolus at the ankle, is 3.42 inches at birth and 15.35 inches in the adult,—an increase in the ratio of 1 to 4.50. The height of the foot, which is about an inch at birth, is three and one-quarter inches in the fully developed man,—an increase in the ratio of about 1 to 3. The length of the foot, from the heel to the extremity of the great toe, increases a little more rapidly than the height, the ratio of increase being as 1 to 3.50. From these measurements it is seen that the thigh grows more than the leg, and the leg more than the foot, and the upper limbs grow quite similarly.

If we examine the limbs of a very young child before it begins to walk, we find them invariably flexed toward the trunk or bent upon themselves. If you straighten them out they will take the flexed position as soon as your grasp is released. In the meantime the spine is quite straight. As soon as the child begins to walk new muscles begin to develop and a change in form begins to take place. When the feet touch the floor the extensor muscles of the legs and back immediately feel the stimulus and new centers of growth are established.

In considering the ratio of growth and development in the body and limbs we have seen that it

varies in almost direct proportion to the distance from the head. The reason for this is very plain. All of the bones and muscles are strengthened and developed in proportion to the resistance that they have to overcome. The neck simply sustains the weight of the head and need not be so large and strong as the trunk; and as the trunk only sustains the weight of the head, neck, and upper limbs, it is not necessary that it should be as large and powerful as the two legs that support all of the weight that is above them.

As the head, neck, arms, and body grow, all parts that have to bear the superincumbent weight must grow and be developed in proportion to the weight they have to sustain. Moreover, from the time a child leaves its mother's arms and begins to stand and walk alone, there is a force with which it, in common with the rest of mankind, is always contending: this force is *gravity*.

We are battling with this force from morning until night, yielding to it partially as opportunity offers to assume a sitting position, and finally yielding to it completely, as we do each night when we sink to rest in a horizontal position. But this force not only acts upon the body as a whole throughout the day but upon each individual part of the body.

Thus the head tends to drop forward, the shoulders to round over and droop downward, the back to curve, the chest to become flattened and compressed, the knees to bend, the arch of the foot to break down, etc. This is nature's attempt to seek an equilibrium, and this giving away to gravity is one of the first evidences of approaching senility, disease, and death. The only way that this downward tendency can be overcome is by the constant exertion of muscular force. Thus, if it were not for the efforts of the muscles at the back of the neck, the head would drop forward upon the chest; if it were not for those running up the spine and on the back of the legs, the body would drop forward upon the pelvis.

The relative amount of force expended by these muscles is largely dependent upon the weight of the head, trunk, and limbs, and upon one's habitual attitude. If any part of the body is thrown out of equilibrium, it severely taxes certain groups of muscles and calls for an unusual expenditure of force. If the faulty position is not corrected, the muscles lose their tonicity, gradually stretch out, and allow a deformity to become established. Hence one of the most important objects that the instructor in physical training has to accomplish, especially in the elementary schools, is to give his pupils a proper

balance or poise. This implies the training and strengthening of muscles from the sole of the foot to the crown of the head.

There are many ways of accomplishing this, as is attested by the fine physiques of different races throughout the world. The methods with which we are most familiar and which are best adapted to the uses of our elementary schools are free exercises, calisthenics, wand drills, Swedish free movements, dancing or balancing steps, and games with balls.

In respect to the carriage of the head and neck, the flattening of the scapulæ, and the poise of the body on the hips, the methods adopted by the Swedes are very successful. They certainly give erectness of figure, even to stiffness; but the conscious effort to carry the head erect, as indicated by the visible tension on the muscles of the neck, and the immobility of the spine in response to the movement of the hips, are not pleasing to look upon, because we know that this artificial rigidity must soon be followed by relaxation, and we cannot rid ourselves of the feeling that the stately posture is assumed for effect.

In contrast to the Swedish method is that of the Delsartians, so called. They claim that too much vital energy is expended in maintaining an erect

attitude and attending to the ordinary affairs of life. Instead of seeking power through action they are constantly seeking it through repose. The kind of exercise they like best is that which requires the least effort and can be done in the parlor where there are plush chairs and downy sofas to recline upon. They assume easy, twining, graceful attitudes, because they think it is beautiful to be graceful and twining. The Delsartians hate the Swedish firmness of frame and the English and German plumpness of figure. In place of the substance they put the shadow, and aspire to a semi-spiritual state which some one has been pleased to term an "elegant limpness and an æsthetic attenuation." This method does not promise much either for the present generation or for the future, and yet it has been talked about and written about more than any other method that has been introduced into America, and actually forms the basis of the so-called "physical training" now carried on in some of the city schools.

This question of carriage and poise is dwelt upon here because it forms the stock in trade of a large number of teachers of physical culture, and appears to be the sole ambition of a great many parents in regard to the physical training of their children.

In the training of children one cannot help thinking that too much stress has been placed upon the carriage of the head, the protrusion of the chest, and the flattening of the scapulæ, — ideals to be worked for in themselves. We naturally associate a drooping head and a flat chest with muscular weakness, and, in our New England climate, with a tendency to consumption. They are not pleasing to our æsthetic sense, and one must rejoice that they are not fashionable even if they are common.

There is not a little danger, however, that in making flat scapulæ, full chests, and straight backs, — ideals to be attained regardless of their vital significance, — a positive injury to the cause of physical training may result. The scapulæ glide around the thorax like two folding doors or shutters, and the fact that they are close together or far apart has no possible connection with chest girth or lung capacity. If the spine has its dorsal curve, which is normal and physiological, and makes room in the thorax for the heart and lungs, and if the muscles that are attached to the scapulæ are properly developed, there will always be a massing of flesh about the shoulders and a gentle rounding of the figure, as is seen to-day in the best types of modern athletes and in the classic statues.

If the aim be solely to have the straight figure and the appearance of power where it does not exist, tailoring will be a much easier way of attaining the desired result, and corseting and padding among both sexes will soon be as prevalent among our young people as they were a few years ago. For a long time this idea was the curse of our military schools, and it interfered so seriously with the development of vital capacity in some of the armies of Europe that an edict was issued against the custom of lacing. Although slight evidences of lacing and padding still linger in some of the schools where military drill is practiced, the fashion has been slowly dying out.

Another objection to the cultivation of the straight figure as an ideal in itself is that it makes children self-conscious and introspective, and while they are in this frame of mind it is very difficult to attain good physical results. We believe sincerely in the fine poise and carriage and in the well set-up figure, just as we do in the anatomical and physiological value of exercise; but we do not think it necessary or advisable to keep these facts continually before the minds of young pupils, or to prescribe for them such movements and exercises as have no other apparent object in view. This method is not pursued

in other forms of education. The child is not told that a certain mental exercise will strengthen his memory or develop his *tuber annulare*, and that some other mental exercise will improve his reasoning faculties and nourish his *crura cerebri*, or any other part of his brain; but rather we try to get him interested in the subject before him, knowing very well that if he once becomes interested he will give the matter his attention, and if he does this, he will improve memory, judgment, and other powers, because he will improve the physical structure of the brain.

We think that the same course should be pursued in a child's physical training. Get him interested in the exercises themselves and he will give them due attention. If they are skillfully arranged so as to bring the head and shoulders back, oft-repeated efforts of this kind will gradually tone up the muscles of the neck and back so that the head and trunk will be well poised without that visible evidence of a conscious strain that is so tiresome to both teacher and pupil.

Notwithstanding the opinion of some of the psychologists that the physical training of the child should be begun with the more fundamental parts, such as the trunk, shoulders, upper arms, and thighs,

we think that considerable attention should be directed to the development of the child's feet and legs. In early infancy the child seems to have as much control over his feet and toes as he does over his hands and fingers. There is no doubt that modern shoes do a great deal to impair the development of the feet and render it more difficult for one to acquire a graceful carriage. For this reason we firmly believe in very thin soles for exercising shoes, and recommend the widest range of feet and leg movements, such as are afforded in balancing and dancing steps. The time is coming when children will be universally encouraged in the innocent and delightful pleasure of dancing to music; not the so-called society dancing where children are taught the self-conscious mannerisms of their elders, but the free, buoyant, and unhampered movement of body and limbs which accompanies joyous action.

Although there are many objections on economical grounds to the use of gymnastic apparatus in schools by children as soon as they are able to walk, there is not the slightest objection on physiological grounds. The children use their hands in arranging their playthings, such as iron horses, iron steam cars, and stone blocks, and assist themselves with their arms in climbing around and

maintaining a balance on their feet. It is carrying the idea of progression a little too far to insist upon children stretching their arms into space to pick imaginary oranges from imaginary trees, or to pick up imaginary apples from the ground, before they are allowed to grasp a real object. Undoubtedly the child's attention should be mainly occupied in cultivating the nerve tracks to and from the muscles, and every conceivable movement should be encouraged with this end in view. We must bear in mind, however, that the hand is a prehensile organ; without the hand there never would have been any muscles on the forearm, and without the forearm there would have been no need of an upper arm or shoulder. The muscles of the arms and shoulders are developed through contact of the hands and fingers with material objects, just as the muscles of the leg and thigh are developed by contact of the feet with the ground. It would be as senseless to confine a child on its back and make it kick its legs in the air after it had learned to walk as it would be to restrict him to simple arm and hand movements instead of allowing him to grasp and move objects.

Much of the awkwardness and backwardness of children is due to mistaken notions of parents and teachers regarding the kind and amount of exercise

that is most appropriate for them. The chief care should be that the exercises are sufficiently varied, that the apparatus is chosen with a view to the kind of movement to be executed, and that all efforts are confined to short periods. The same conditions that make the organism susceptible to improvement make it more liable to injury. It is perfectly natural for children to run, jump, and climb, and to swing on ropes, poles, and ladders; and it can be proved conclusively that the upper limbs and muscles of the chest and back require just such exercise for their perfect development.

But here we begin to touch upon some of the conditions governing school life. Whatever may be our aspirations in regard to physical training, or our conclusions as to the best methods of developing the children, we are limited and hampered by the conditions under which the gymnastic work has to be performed.

In the first place, too little time is allotted to physical training to attain anything like the desired results; indeed one might even add, to correct the cramped and constricted chests and crooked spines that have been acquired in the schoolroom by the pupils trying to accommodate themselves to improperly constructed school furniture.

The schoolrooms are kept at too high a temperature to admit of much serviceable exercise in school clothing without starting perspiration and thereby exposing the children to catarrhal congestions and colds.

The space between the desks is too limited to allow of that freedom of movement that is so desirable in order to realize the best results. Under present circumstances the most that can be done is a miserable compromise, whether the method is termed American, English, or Swedish, and the effect will hardly be appreciable in the physcial status of the pupils. Still the little that can be done is a great deal better than nothing. Even frequent change of position, and any movements of the arms, legs, and body that will quicken the respiration and circulation, if only for a minute, are steps in the right direction.

Let us hope, however, that the day is not far distant when every large school building will have one room fitted up as a gymnasium to which all the pupils may go at stated periods. Where this is not practicable there should be a public bath and a school gymnasium in every school district. The success that has attended the opening of the public gymnasiums on the Charlesbank in Boston is an augury of what we may look for in the future.

Another thing to be kept in view in considering the question of physical culture for elementary schools is the various objects to be attained. These differ so much among different people that it is almost impossible to find any agreement of opinion as to just what is desired to be accomplished by physical training; yet upon this decision depends the method of work and the selection of exercises.

If it is desired that the children should be healthy and strong, they must exercise in fresh air, taking movements requiring considerable muscular exertion. If we wish them to be active, self-reliant, and alert, we must give them an early introduction to children's gymnastic games. If we wish to make them skillful, we must require them to practice those exercises which demand a nice adjustment of eye and hand and a keen muscular sense. If we desire them to be graceful, we must encourage them to participate in graceful movements, and so on through the whole range of mental and physical faculties which are susceptible of improvement by exercise.

It is on account of this easy applicability of special exercises to special purposes that some persons are often led to make a wrong use of them. In some schools physical exercises, like military drill, for instance, are encouraged principally because they

help in school discipline; in other schools they are recommended as additional agents for keeping the mind alert and aiding mental development. It is on this ground that the order movements in Swedish gymnastics are sometimes defended.

While the disciplinary use of physical exercises may be justifiable in certain schools, we believe that it is positively injurious to insist upon it under all circumstances. One of the objects for which physical exercises are introduced into school life is to relieve the brain from prolonged tension and allow the mental faculties a few moments of rest. To keep the attention riveted upon a teacher's verbal orders for a physical movement is a mental effort which is unwarranted and inexcusable. In our opinion it is a much more rational method for the teacher to relieve this mental tension by illustrating the first movement in a series, thereby aiding the mind to grasp the nature of the exercise as readily as it would that of any other subject. Where this is not done the brightest and most conscientious pupils, and those who would best be conserved by physical work, are the very ones who will suffer the most from the nervous strain.

The best method of physical culture for elementary schools is that which has not yet been congealed

or stereotyped into a system. It is that method which leaves something to the common sense of the teacher, and which is so pliable and elastic as to be easily adapted to the condition of the individual, the vagaries of our climate, the mixed state of our population, and the complexities of our civilization. It will not be strictly English, solely German, or exclusively Swedish, but will bear the same relation to the methods carried on in the older countries as do the other forms of education now progressing in America.

CHAPTER XI

PHYSICAL TRAINING IN THE SCHOOL AND COLLEGE CURRICULUM

As both brain and body are necessary parts of the human organism, the practical question arises as to the relative amount of care and attention to be given to the development of each in a scheme of education. Looking at the subject in a large way, we find plenty of evidence that the nations that have given the most attention to the care of the body have not only been of a superior quality physically but also have invariably attained the greatest mental preëminence. According to Grote, the historian, Greece devoted more time to the physical training of her youth than to all other branches of education combined, and yet Galton tells us that the Greeks were as superior to us in intellectual ability as we are superior to the African negroes. Among modern nations Germany and England rank highest in mental attainments, and yet these nations give more attention to the physical training of their school children than any others, the former through its admirable system

of gymnastics, and the latter through its highly organized athletic sports and games.

If we seek for further evidence of mental superiority associated with fine physiques, we can find it in smaller groups than those represented by races or nations. The Fellows of the Royal Society in England probably represent as high an order of intellectual ability as any single group of men that could be selected; yet, upon the evidence of the Committee on Anthropometry from the British Association for the Advancement of Science, these men average 69.75 inches in stature and about one hundred and sixty-five pounds in weight. The English professional class averages 69.14 inches in height, which is only exceeded by the Scotch agricultural population, and by the London police, who represent a body of men selected especially for their fine physiques.

During my period of service at Yale University, from 1873 to 1878, the first divisions in scholarship were almost invariably the best divisions in gymnastics. At Bowdoin College, according to the investigation made by President Hyde in 1890, the best scholars as a class were found to have the best physiques. At Harvard University it has been found that the percentage of scholarship men who show a high degree of physical power, as indicated by the

strength test, is fully as large as that of the great body of students, while the percentage of weaklings is really less. From the data obtained by the examination of thirty thousand school children in St. Louis, Dr. William T. Porter found that among pupils of the same age those who were in the highest grades were the tallest and weighed the most, and those who were in the lowest grades were the shortest and weighed the least. In 1896 Dr. Porter's discovery was confirmed by Mr. Charles Roberts, of England, who made a similar investigation among the school children of London. Mr. Roberts found that there was a definite relation between size of body, as determined by stature, weight, and chest girth, and precocity and dullness of intellect in children. In other words, it has been found that the more intelligent classes are taller and heavier than the less intelligent of corresponding ages. The same conclusion has more recently been reached by Gratsianoff in Russia, by Dr. Hastings in Omaha, Nebraska, and by Dr. Beyer in Cambridge, Massachusetts.

As an illustration of the influence of judicious physical training upon a dull and sluggish state of mind, the experiments tried at the Elmira Reformatory in 1886, under the direction of Dr. Hamilton D. Wey, give us most convincing evidence. Dr. Wey

selected some half dozen of the most obtuse dullards that could be found in the reformatory and had them put through a special course of vigorous physical training for one year. This class at once began to improve mentally and morally as well as physically. All of them passed from the lowest into the higher grades, and most of them maintained their improved mental standing after the period of special training had elapsed.

It is a little more difficult to show the relation between a good physique and high mental attainments in individual cases, because there are many exceptions, but this is true of any deduction that can be made in regard to the human organism. If the student of biography will look up the life history of the men who have been the foremost leaders of the world in every branch of service and every kind of endeavor, he will find almost invariably that they have been men with sound bodies and vigorous minds. Of course there are many men, like Pascal, Darwin, and Herbert Spencer, who have been able to accomplish a prodigious amount of work though suffering at times from feeble health. Nevertheless it takes a pound to balance a pound. The energy put forth in their intellectual efforts must have had a physical basis, and their bodies must have been

tough and enduring enough to meet all the demands of their hard-worked mental organism through a long term of years. If, by cutting off the drains in one direction and husbanding their resources in another, Darwin and Pascal were able to do a great amount of work in their chosen field, this is hardly an argument against the building of better bodies as a foundation for still better service.

Considering the multiform demands made upon the time and energy of a great man, we are not so sure that a little invalidism does not sometimes afford the best means of conserving his force and prolonging his life. But to argue that the best mental results may be attained through the agency of a feeble body is to argue that the most work may be done by the efforts of a feeble engine, which is a physical impossibility. The body may be made feeble through the inordinate activity of the mind, but the mind is never made active and enduring through the weakness of the body. "Cultivate the physical perfection of the body, and the mental perfection will follow as a matter of course; neglect or suppress the physical and force the mental faculties, and failure of both will certainly follow."

While most persons are prepared to accept this physiological truth, many maintain that it is not

necessary to make any effort to give the body, as a body, any special exercise or training. They claim that the ordinary duties and employments of life will give one all the physical training and development that he needs. This may have been true in primitive times, when it was necessary for a man to do his own plowing and planting, reaping and mowing, to chop his own wood, hunt his own game, catch his own fish, make his own tools, build his own house, and do the hundred and one things necessary to maintain a comfortable existence. But times have changed. Now a man does some one thing for himself and everything else is done for him. The minute division of labor and the extensive use of steam and electricity have wrought most radical changes in our methods of working and living. Not only is all the mental work now done by one class and all the physical work by another, but even the mental and physical work is so divided and subdivided that it is possible for one to perform some necessary function in the business or industrial world by the employment of a very few muscles and faculties.

Think of the mental vacuity and muscular inertness of a man who spends his life polishing a wooden handle or watching a railroad ticket drop into a box,

or who simply tends a machine that now does the work once thought possible only to human skill and intelligence. Yet these are fair examples of the mental and physical ability required of hundreds of occupations that now furnish man with a livelihood. Apart from the work of the professional classes and that of the great organizers, financiers, inventors, merchants and executive heads, chiefs and leaders of various arts, trades, and industries, which appeal to one's pride and ambition and call for a high grade of intelligence, the ordinary employments of life contribute little or nothing to man's intellectual or physical ability.

In spite of all that we hear about the struggles of poverty, there never was a time in the history of the world when the great mass of mankind could meet the simple exigencies of life with so little expenditure of time and energy as to-day. When we consider that the prime motive that has brought man to his present state of mental and physical efficiency has been the struggle for existence, and that the primitive man probably had to exercise more real mental acumen and sagacity — had to be more agile and alert, and bring into action more varied qualities of mind and body in order to live — than the great mass of our present population, some

of the tendencies of our present civilization may well give us reason to pause. We already know that there is a difference of five inches existing between the average statures, and a difference of twenty pounds between the average weights, of the best and the worst nurtured classes. We also know that criminals and lunatics are below the average in height and weight, and that there is an ever-widening gulf between the physical and mental stamina of the highest and lowest stratum of society.

Inasmuch as the peculiar tendencies of our civilization have deprived the great mass of our people of an incentive to use more faculties of mind and body than are necessary in order to live, and inasmuch as we know that these faculties cannot long be kept from degenerating unless furnished with their customary nutriment through exercise, the question of supplying some artificial means of both mental and physical development becomes one of the greatest importance. It is difficult to see how the stability and integrity of the race can be maintained in any other way. Many persons have already comprehended the problem, and the efforts that are being made to interest old and young in parks, playgrounds, athletic fields, gymnasiums, public baths, museums, libraries, art exhibitions, lectures,

conferences, and debates are all steps in the right direction, and are doing a great deal to improve the mental and physical condition of our people.

But in order to obtain the best results we must carry this movement farther. We must make the improvement of the body an essential requirement of our school system. There is a tendency to regard school children as that portion of the community which is to earn its living by its mental attainments, in contrast to that unfortunate part which is supposed to be dependent solely upon its physical efforts. Consequently the amount of mental work has been greatly increased, while the time formerly allowed for exercise and recreation has been correspondingly diminished. Parents complain that children return from school loaded with books, and spend all the evening preparing their lessons for the next day. They can find no time in the morning to assist about the housework or to do errands and chores that would at least furnish them with some sort of exercise, but they must hurry off to school, probably by steam cars or electrics, for fear of being late. There is not, however, a single exercise in the school curriculum that requires them to lift their arms above their heads or to use their hands and fingers, except to thumb the leaves of a

book or to handle a piece of chalk. And yet we know that arm movements are more nearly associated with mental action than leg movements, which in walking require but little attention, and that it is almost impossible to develop the chest, and thereby enlarge the lungs, without using the arms.

As a consequence of our one-sided method of school education we have reason to expect some unfavorable results. In the schools of this country we have but little reliable data as to the amount of disease among school children. We know that in the schools of Boston only about fifty per cent of the pupils who enter the elementary schools ever get through the fourth grade in the grammar school, and only fifteen per cent ever reach the high schools, while less than half of that number graduate. Although many children are withdrawn and put to work to help support the family, a large number are known to drop out from ill health or inability to stand the mental and nervous strain. Those who graduate from our high schools and enter college represent the survival of the fittest in a physical as well as a mental sense. As a fair example of the sickness that prevails among school children, we quote from the recent report made by Professor Axel Key to the Swedish government.

According to my examination of fifteen thousand boys in the middle schools more than one third are ill or are afflicted with chronic maladies. Shortsightedness, which is for the most part induced by the overtaxing of the eyes in school work, and well merits the name of school sickness, rises rapidly in prevalence from class to class. Thirteen and a half per cent of the boys suffer from habitual headache, and nearly thirteen per cent are pallid; and other diseases arise in the lower classes and then decline, to rise again in the upper classes. Diseases of the lungs are the most frequent among organic disorders. Diseases of the heart and intestinal disorders show a considerable tendency to increase in the higher classes. As to the average of illness in the different classes, it appears that in Stockholm seventeen per cent of the children in the first class were ill at the end of the first school year. In the second year the illness curve rose to thirty-seven per cent and in the fourth class to forty per cent.

Among the schoolgirls, the future mothers of the generation to come, investigations instituted in thirty-five schools with 3072 pupils brought out a fearful amount of illness. Sixty-one per cent of the whole, all belonging to the well-to-do classes, were ill or afflicted with serious chronic disorders; thirty-six per cent were suffering from chlorosis, and as many from habitual headache; at least ten per cent had spinal disorders.

Sixty-one per cent made sick in learning how to live! What sadder commentary could be made upon our present school system? It would be surprising if the condition of ill health portrayed by Professor Key had not forced itself upon the attention of the school authorities, and obliged them to take measures to improve the physical status of the

school children. Indeed, efforts have been made in this direction for several years past, and it is gratifying to state that there has been, at least, a perceptible improvement in the physical condition of the students who go to college. This improvement may be attributed largely to the increased attention given to gymnastics and athletics, the extensive use of the bicycle, the increased participation in recreative games, the improvement in the sanitary condition of school buildings and dwelling houses, and the great interest taken in the selection and preparation of food products and in matters of personal hygiene. This sanitary movement, though popular with the higher classes, has not yet become sufficiently general to produce any very marked effects upon the health and physique of the great mass of pupils now attending our public and private schools.

The subject of physical training, which in its best sense means applied hygiene, is still regarded with indifference by most parents and teachers. Parents wish their children to have a practical education, as they term it, but the majority of them fail to see the bearing which physical training has upon the much-desired mental acquirements. The teachers feel that their reputations depend upon

the amount of verbal knowledge they can pump into the heads of their pupils in a given time, and consequently look upon any kind of physical exercise as one of the many distractions that tend to interfere with the attainment of this object. The school boards are largely governed by the wants of their constituency, tempered somewhat by the opinions of head masters and teachers in the various departments. As the governing boards are usually of a practical turn of mind, the measures for physical training generally adopted after all interests are consulted are those which promise the most, cost the least, require the smallest amount of time, and interfere as little as possible with the existing curriculum. A scheme of physical training so hampered and restricted could hardly be expected to be very prolific in good results. It implies the making of promises which cannot be fulfilled; the employment of incompetent, half-trained teachers; the attempt to work under unfavorable conditions, without apparatus, without change of clothing, without baths, without sunlight, and almost without air. Under such conditions, with no attempt made at classification according to physical needs, with every one doing the same thing, without any moral enthusiasm on the part of the teacher, without hope of approval

or reward on the part of the pupil, without even the inspiring strains of music to relieve the monotony, our public school children are put through what some persons have been pleased to term educational gymnastics. After a few years of this kind of work is it to be wondered at that both teachers and pupils should unite in one prolonged cry for recreative exercises or for more plays and games?

Under the most favorable hygienic conditions it is very difficult to accomplish much in the way of physical improvement by giving to it only ten minutes a day. When parents and school boards expect to see defective constitutions rebuilt, vigorous health attained, and all the physical evils and defects that have been acquired by ten hours a day of school work removed by devoting a few minutes a day to gymnastics under the conditions we have described, their expectations become simply laughable. Fortunately there are a number of schools in the country where it is not thought necessary to sacrifice one's health and physical vigor in order to obtain an education, and where, if a boy intends going to college, he is prepared both physically and mentally. We regret to add, however, that these schools are vastly in the minority, and that the subject of physical education has not begun to receive the attention

which it merits from parents, teachers, and school and college authorities.

The causes which tend to make physical training of some kind a necessity are more numerous and more urgent to-day than ever. Some of them arise from organic necessities. A large part of our youths must have an opportunity to exercise their motor impulses or the race would soon deteriorate. You cannot suppress in one generation what hundreds of generations have been fostering and developing through necessity. When the law requires children to attend school in order that they may have their mental sensibilities played upon, and be filled with enthusiasm to live nobly, act courageously, and do the thousand and one things necessary to make good citizens and perform some useful function in society, it would hardly be the part of wisdom to suppose that these children are going to postpone their physical activity until they have completed their mental education.

Fortunately for the community in one respect, though unfortunately, we think, in another, our youths do not propose to be educated in this way. Inasmuch as educators persistently ignored the claims of the body and adhered to the old régime of mental drudgery without interest and without pleasure,

schoolboys and college youths were forced to find interests and enjoyment in more active pursuits. At first these took the form of impromptu school games, midnight carousals, town and gown fights, and systematic hazing. In the early sixties and seventies of the last century this inborn love for motor activity began to show itself in organized sports and games. This was the beginning of modern athletics.

Every school and college of note now has its athletic club or association, while baseball, football, and rowing clubs have increased correspondingly. The public interest in athletic contests has also increased enormously, the papers being filled with every detail in regard to practice and training, and the great football games bring together from thirty to forty thousand people. Naturally enough a subject of so much general interest, operating through a quarter of a century, would tend to produce certain marked results, though there probably would be a wide difference of opinion as to what these results were.

In our opinion some of the favorable effects of athletics may be summarized as follows: They have afforded our school and college youths a subject of immediate interest to discuss, rally round, and enthuse over. They have taught them to respect deeds

rather than promises, to be governed by laws rather than by haphazard opinions, to submit to discipline, set selfish interests aside, and render obedience to their captains and leaders. Athletics have advanced the tone of youthful morals by setting higher ideals of manhood for the weak, by furnishing a legitimate outlet for the superfluous energy of the strong, and by furnishing a fair field of activity for the courageous and daring. The achievements of individual athletes, clubs, teams, and associations have provided live topics for written composition, and have probably afforded a better drill in the writing of good idiomatic English than any other class of subjects.

The interest aroused by athletics has, in our opinion, also contributed in no small degree to the enrichment of the college curriculum, by obliging instructors to make their courses more interesting and attractive in order to command attention. The management of athletics and the handling of men under trying conditions and circumstances have afforded an admirable training in executive ability, and some of our foremost young men in business and government affairs got their first experience in this way. This is a matter of no little importance, inasmuch as a large per cent of all our college graduates now go into business instead of into the professions.

Undoubtedly athletics have also been largely instrumental in inducing a large number of youths to take vigorous exercise and to work with definite ends in view. The extensive practice of these invigorating exercises, the adoption of the training diet, and the more rational methods of living have thus contributed in a measure to the improvement of the general health of the community.

Most of the objections which have been made to athletics have arisen more from their excesses than from their legitimate uses. Nevertheless there are certain well-founded objections which are worth considering.

It is claimed that athletic contests not only fascinate the participants but also allure hundreds of non-athletic young men from their studies, and thus interfere with serious intellectual work. The protestations of the instructors are of no avail, for the whole country seems to be against them on the subject of sports. Moreover, many teachers have felt obliged to ally themselves with this athletic movement in order to have any influence over their pupils. Its power in politics in and out of college has long been manifest; every alumni dinner is overburdened with the athletic menu, and for the past twenty years hardly a college president has

been appointed who has not approved of this movement. The value of athletics has so impressed itself upon the young men of the present day that it is a question whether those who oppose them do not lose something of their power and influence as authorities in their own special subjects. There is certainly a growing feeling among the student classes that college professors, like ministers of the gospel, are expected to preach against athletics in deference to their positions, yet the strongest arguments in favor of vigorous physical exercise may be drawn from the lives, teachings, and writings of these very professors.

It is a serious thing to oppose the positive convictions of a large body of men who have gained their knowledge by experience. If it does not breed contempt for the authority of those who oppose them without proper knowledge, it certainly tends to confirm them in the strength of their own opinions and methods of doing things. Here again we have, perhaps, the foundation of another argument against athletics, for many claim that they tend to cultivate an athletic frame of mind or a combative spirit, and with this spirit a disposition to carry things by storm, and to resort to rush-line tactics in business, in politics, and in war, instead of the calmer and

more deliberate methods which characterize the intellectual classes. With these far-reaching effects of athletics we do not propose to contend. What interests us most is the effect which athletics as at present conducted are likely to have on the cause of physical education. Even after admitting all the evils — and we have not mentioned half of them — that may be attributed to the popular furor over competitive sports and games, we are prepared to maintain that they are simply the result of the conditions under which we live, and of the aims and motives that incite most of us to action.

Some one has said that the great fundamental motives of conduct in life have been the hope of heaven, the fear of hell, or the love of God. For our purpose we will assume these motives to be the hope of reward, the fear of punishment, or the love of truth. It would be difficult to think of any branch of human activity that is not influenced by one or another of these three motives. Beginning in the nursery and extending up through all the schools and colleges, throughout the professions and into every branch of business and every department of labor and service, either the hope of reward or the fear of punishment holds sway. We have had a remarkable exhibition of the influence of these

motives upon the conduct of the men who participated in the late war with Spain. When admirals and generals contend for rank and distinction for doing their duty, we can hardly expect schoolboys and college students to be unmindful of prizes and rewards, of honors and approval.

The only thing in athletics that brings prizes and approval is victory, and the only way to attain victory where competition is keen and the spirit of emulation intense is by hard, grinding work. This means that a lot of time and energy must be devoted to some one sport, and that a great many personal sacrifices must be made. As a general thing the school or college which has the largest number of men from which its athletes may be chosen, and which will devote the largest amount of time and money to athletic training, will win the greatest number of athletic victories. If other institutions are willing to enlarge their field of selection and pick up ready-made athletes all over the country, giving them an equal amount of training, they in turn will be likely to attain more than their legitimate share of athletic victories.

To be always successful in athletics will certainly advertise a college, but it advertises it in the wrong way, for it simply indicates that that institution is

devoting more time to athletics than to anything else. Soon after coming to Harvard University, in 1879, one of the first things that occurred to me in attempting to organize my department and to insure harmonious relations between the different academic and athletic interests was the necessity of getting the different colleges to come to some agreement regarding the appointment of athletic trainers, the classification of competitors, the number of years they should be allowed to compete, and the conditions under which the contests should be conducted. An intercollegiate committee was appointed to draw up regulations and recommendations covering these points. The several college faculties, however, in deference to the wishes of the students and alumni, refused to adopt the regulations of the intercollegiate committee and the matter was dropped. It is interesting to note at this time that nearly all these regulations have since been adopted by the students themselves, and that they have even exceeded the expectations of the faculties and put an academic requirement on all athletes who would compete at the intercollegiate games. Thus it has taken over twenty years, a new college generation, and an immense amount of effort to bring about a reform, the necessity for which had been for a long time

perfectly apparent to the executive heads of most of our colleges and to those who were in a position to know the facts.

Given two absorbing interests, one appealing to the mental the other to the physical side of life, and let it be required that the standard of both mental and physical work be continually raised, a time would soon come when it would be impossible for the same person, unless extraordinarily endowed, to reach a high degree of excellence in both mental and physical attainments. When this time came it would be necessary for the person who desired to attain a position above mediocrity to decide whether he was to devote the greater part of his time and energy to mental or to athletic pursuits.

This time arrived at Harvard University some years ago. An examination of the college rank list showed such a dropping off in mental attainments among the athletic men that the faculty felt obliged to require a certain class-room standing of all competing athletes. The same measures have been adopted at Yale, and, as we have already indicated, the students of these two universities now insist upon the athletes of other colleges giving equal evidence of their rights to compete as college students.

No one who knows anything of the fundamental necessity in amateur athletics of securing, so far as possible, the competitiveness of the men on equal terms will question for a moment the justice and desirability of the students' action in this matter. On the other hand, no one who recognizes the aims and purposes of our institutions of learning will hesitate to commend the wisdom of college faculties in requiring college athletes to give satisfactory evidence of their mental abilities. The very existence of such places as gymnasiums, boathouses, athletic fields, running tracks, tennis courts, and swimming tanks, in connection with schools and colleges, implies that they are expected in some way to further the main objects of these institutions. No one will admit that they are simply to develop athletes as such, or simply to make student athletes, but all might unite in the opinion that they are designed to develop athletic students.

As we have already intimated, there never was a time when vigorous athletic qualities were so much needed among educated men as at the present day. The demands of the times are not so much for a few brilliant or deeply learned men as for a large number of highly intelligent men, — men who have not only the courage of their convictions but also the

physical hardihood and mental tenacity that enable them to stay in their places and work at their posts of duty after their more brilliant associates have wearied of welldoing and dropped out of the struggle. The qualities that enable men to endure are not the overwrought, high-strung conditions of nerve and muscle that sometimes win athletic victories, but rather that perfection of structure and harmony of function that assure good health. This condition cannot be maintained without giving a certain portion of one's time to some kind of muscular exercise, inasmuch as forty-five per cent of the whole body is made up of muscular tissue.

When the writer first went to Bowdoin College, some thirty years ago, it was customary for many of the students to work upon farms, or in shops and mills, or at some kind of physical labor for half the year, in order to earn money enough to pay their college expenses. During my first years here at Harvard there were students connected with the university who were defraying their expenses by doing manual labor; and there are still those at the present time who are helping themselves along by their physical efforts. The conditions of college life, however, are so different now from what they used to be that it would be exceedingly difficult for a student

to earn enough money by manual labor, even if he could get it to do, to defray all his college expenses and keep up with his studies at the same time. It is much easier for him to earn money by teaching or by doing some kind of clerical work, though this does not give him the change from mental to physical effort which his system so much needs.

The college authorities recognize how hard it is for a young man to earn his own way and do the necessary mental work to entitle him to a degree. Because of this difficulty arrangements have been made to furnish assistance to deserving students in need of pecuniary aid. Harvard University invests something like ninety thousand dollars annually in the abilities of some two hundred and fifty young men, in the hope of getting at least a fair return in the good service which these young men are likely to render the community in the future. But what is the university doing to assist the large number of students who are poor in physical capital and vital resources, upon which their ability to render service of any kind so largely depends? Without doubt Harvard furnishes the largest plant and the best general equipment of any institution in the land for improving the physical condition of the students. Into direct competition with this splendid opportunity,

however, she has brought all her honors, prizes, pecuniary stipends, and rewards, as well as the personal power and attractiveness of some four hundred instructors, which keep the students from getting the very physical benefits which the athletic equipment of the university was designed to give them, and which, of course, all the faculties and governing boards are anxious for them to have. And as though all these opportunities for honors, rewards, and distinctions were not enough, the university holds over the head of each student a requirement of eighteen courses and the dread punishment of withholding his diploma should he fail to attain a certain rank in scholarship.

Now what are the motives which incite one to regular systematic physical effort? We have already referred to the honors and rewards that come to victorious athletes, and how they are stimulated to action through dread of the chagrin and disfavor that follows defeat, or the failure to realize the object for which they have been striving and training. Even admitting that athletic honors and distinctions furnish just as laudable motives for physical activity as college degrees and scholarship honors do for mental activity, the chances for any considerable number of students attaining athletic distinction are

very small indeed. At Harvard University not more than ten per cent of the students ever attain positions on the various athletic teams, and not more than twenty per cent of the whole number ever try for them. That leaves over seventy per cent of all the students at Harvard without any motive for physical training, such as they experience in other departments of college activity and in all the varied pursuits of life. It is true that there is the grand incentive of the love of God and truth and the attainment of health and physical perfection for its own sake. Although these lofty aims and incentives are beginning to appeal to many persons as part of the divine plan of evolving a better condition of affairs, we fear that there is little hope of getting our schools and colleges to adopt them as a fundamental basis for mental activity. If, therefore, as practical educators, we would have the physical department act in harmony with the other departments of education, we must adopt their method of stimulating pupils to active efforts; that is, we must furnish them with some immediate and imperative motive for action. At the present time it is possible for a student to attend a course of lectures on physiology and hygiene, write down the results of another man's intellectual efforts, commit them to memory, and, a few

months later, rewrite them in an examination book and get credit for his labor towards a degree. If, on the other hand, the same young man is moved by the words of the instructor to reform his habits of living and improve his physical condition, he may work faithfully and well for four years in the gymnasium, thereby making himself, as any one will admit, a better man for anything he is likely to be called upon to do, without receiving from the faculty the slightest recognition for his efforts. The difficulty of the mental as well as the physical efforts involved in the two processes, and their relative value, the reader must determine.

Inasmuch as the only incentives in the way of prizes, honors, and distinctions which the physical department can offer seem to conflict with the best interests of college life, and have proven inadequate for the great majority of students, why not adopt identically the same incentive for physical as for mental efforts, and place all to the credit of the man who is striving for a degree? Of course everything depends upon credit being given for work actually done, the presumption being that every earnest, systematic effort, mental or physical, on the part of the student is for his personal improvement. If such effort were otherwise intended, such credit would not

be permitted by the college authorities. The adoption of the credit system would tend to bring all the work of the physical and academic instructors into harmony, for all would be working with the same end in view, namely, the improvement of the whole man in the hope of making him a better citizen and a more creditable representative of the college. The adoption of such a measure would not only prevent student athletes from carrying their athletics to such an excess as to lower their rank and mental standing but would also keep scholarship men from impairing their health and physical standing by overwork.

If the colleges and universities would make physical training an essential part of their curriculum and give credit for the results attained, the college preparatory schools would be induced to prepare all their pupils physically as well as mentally. We have already seen that as a class the pupils who have the best physiques are able to do the best mental work. Would it not be wise, therefore, to recognize the value of physical training as an essential prerequisite to the attainment of the highest intellectual results in a school, a college, a community, or a race? After thirty years' observation in this field of endeavor we are firmly convinced that it would.

CHAPTER XII

IDEALS IN PHYSICAL EDUCATION

At the present time in the United States we find physical training established in some form or other in two hundred and seventy colleges and universities; ninety-eight are doing organized work, seventy-two require physical exercise, and twenty-four include it in the work required for a diploma. About three hundred cities have introduced physical exercises into the public schools and one hundred of them have special teachers. There are about five hundred Y. M. C. A. gymnasiums in different parts of the country with a corps of some three hundred physical directors and eighty thousand members. The North American Turnerbund has some three hundred gymnasiums with about two hundred instructors and some forty-five thousand members. There are perhaps one hundred athletic club gymnasiums of one description or another and a few out-of-door and public city gymnasiums. Then there are gymnasiums in private houses, churches, hospitals, sanitariums, army and navy depots, police quarters,

engine-house stations, mission houses, industrial schools, and other institutions to the number of several hundred. In addition to this form of physical training there are a great variety of special athletic clubs for boxing, fencing, bowling, boating, canoeing, swimming, bicycling, etc. Golf, tennis, baseball, and football also have their ardent devotees and numerous following, while the more passive forms of exercise, such as riding, sailing, and driving, are popular with thousands of people.

Taking into consideration all the sports, games, and well-established forms of exercise, it is safe to affirm that they represent millions of capital invested and affect the lives of millions of our people. The amount of money which people are willing to spend in the furtherance of a movement is a pretty good indication of its value in their estimation, though if judged from an educational point of view this value would probably be considerably discounted. If we were to estimate the value of the century's efforts in physical training by the effects produced, the problem would be a difficult one on account of the many factors involved and the increasing number of influences that tend to neutralize all the good effects that might be derived from systematic physical exercise. Those of us who are engaged in making physical

examinations know the effects which the practice of special forms of exercise have upon the individual, and it is fair to presume that the same exercises practiced by many people will tend to have similar effects. Thus, when a great popular interest in bicycling, lawn tennis, golf, boxing, or football sweeps over the country, the tendency will be to produce among the masses the same mental and physical characteristics that are recognized in the individual devotees of these popular pastimes.

It is hardly necessary for us to dwell here upon the special effects of these forms of exercise, for all are more or less familiar with them. Not one of them would be regarded as perfect from a mental, moral, or physical point of view, and yet they have produced a most profound effect upon our people. Bicycling, lawn tennis, and golf have proved especially valuable to our women, inducing many to exercise who never exercised before. These three sports have probably done more to overcome the evils of tight clothing than a whole century of preaching and lecturing on this subject. Boxing, football, basketball, and other antagonistic games have done a great deal to lessen the evils of over-refinement and excessive sentimentality, and they may be conducted in such a way as to develop a

firm character and a manly spirit. There are, however, certain inclinations connected with the development of competitive sports and antagonistic games that are not only detrimental to physical training in its best sense but are also demoralizing to our youths and to the public in general. Let us consider some of these drifts and tendencies.

Thirty years ago amateur baseball was at its height in America, and there were well-organized clubs in nearly every city in the union. To-day there are very few amateur baseball clubs outside of the colleges, and the interest in this once popular sport is declining in our institutions of learning. Professional baseball has superseded amateur baseball in popular interest, and although the game is just as beneficial as ever from a physical and recreative point of view, it does not have anything like the following it once had. The interest in college boating culminated in 1875, when thirteen crews were present at Saratoga. In some colleges this sport has been abandoned altogether. In a few institutions it has been reëstablished, and in some, especially at Harvard University, there is a great revival of interest in boating, as many as twenty eight-oared crews being on the river at one time. The practice of archery was quite generally established in this

country in the early seventies, and there were numerous clubs of both sexes that rallied around this form of recreative exercise. The interest culminated in 1879, and at the present time there are few archery clubs in existence. The so-called higher gymnastics attained their greatest prominence in the colleges and city gymnasiums in the early seventies. Boxing and wrestling contests attained their greatest popularity at Harvard University in 1883, 1884, and 1885, and are now practically abandoned, although two instructors in boxing are regularly employed at the gymnasium. The interest in lacrosse and cricket has waxed and waned, but the games have never been entirely abandoned.

Field and track athletics have a strong following in the vicinity of New York, Boston, and Philadelphia, but in the colleges and other communities they attract small audiences and little attention compared to what they did a few years ago. The great city athletic clubs, which once fostered track and field athletics, now seldom have any representatives from their own membership in the public contests, and confine their attention to exploiting the athletic abilities of outsiders for the entertainment of their regular members. Some of these athletic clubs, notably the one in Boston, act as patrons for school

and college athletes, and do a great deal to encourage the practice of outdoor sports and systematic exercise among their junior members. Many of these city athletic clubs, like the Washington, Detroit, St. Louis, Providence, Fitchburg, Louisville, Philadelphia, the Pastime in Brooklyn, the Manhattan and the Staten Island in New York, have been given up entirely or turned into social clubs.

Notwithstanding the rise and decline of interest in many of the popular sports and exercises, there never was a time in our history when so much attention was given to sports in general as at the present day. As the interest in archery, roller skating, croquet, and boating declines, the interest in bowling, bicycling, golf, canoeing, or some other sport increases. Then again, the interest in certain sports, although less intense, may in reality be very widespread and may be participated in by a great many people.

Now the important question is, What are the factors which cause some sports to decline and others to grow in popular favor? In answer to this question we are forced to admit that fashion plays a very prominent part, bringing into vogue at one time sports which have but few valuable features, and sweeping away at another time exercises of the

greatest importance. Some of the special forms of exercise, like archery, fencing, and Delsarte, may be taken up as society fads and practiced for a few seasons, but they are soon forgotten. Even the more serious forms of exercise are sometimes taken up by society because they are thought to be the "proper thing," without regard to their hygienic or educational value. In fact, one would be rather averse to admitting how much of physical training is without scientific or artistic value, because it is governed so largely by fashion and caprice.

Again, the spirit of emulation and competition which we try so hard to foster and cultivate has its limitations, and it is a serious question just how far it may be carried without detriment to the cause we are striving to advance. A high spirit of emulation breeds rivalries and enmities, and often stirs up bad blood and leads to the establishment of more or less permanent factions, which may work great harm to a school or club. This is especially likely to be the case where competitions are confined to members of a club or to the different classes of a school or college. What discussions upon religion and politics are to social clubs athletic contests are to athletic clubs, if the contests are limited to members. The hardest struggles on the athletic field are

frequently between classes or members of the same institution for positions on class or university teams. The feeling of bitterness and enmity often engendered by these hard contests in schools and colleges is softened and assuaged by the thought that knocks, strains, and bruises must be endured in practice in order to enable the chosen school, college, or university team to vanquish its rival from some other school, college, or university. In this way a feeling of unity and solidarity is often established in an institution, which might otherwise be broken up by feuds and dissensions. It is the lack of this feeling of unity on the part of the city athletic club, and the unwillingness of its members to endure the hardships of training for those severer contests that alone interest the other members, which make these clubs after a few years fall apart simply from lack of any common interest to bind them together.

Another disrupting influence is the establishment of too high a standard. This is one of the evils of professionalism and really marks the underlying difficulty of settling who is and who is not an amateur. The poorest professional must be a better performer than the best amateur, in order to constitute himself a professional and be able to receive money for his services. The receiving of money, however, is a

secondary consideration, which follows the attainment of superior merit, resulting from the long and persistent practice or training which a person is obliged to undergo in preparing for a life profession or occupation. When, therefore, students, clerks, and young men who work with their brains rather than with their muscles are urged to practice certain exercises or sports as a means of improving their health and physiques, and are offered prizes or trophies of victory as incentives to train and compete, one of the first essentials of a fair contest is to see that those who enter the competition are of the same class or of somewhere near the same ability. Now if the contest is in rowing, and those who make a business of rowing are allowed to enter, the conditions would be unfair. Students who are engaged in their studies, or clerks who are occupied with their bookkeeping through the working hours of the day, and who take up rowing only as a recreation or pastime, cannot compete with professional oarsmen on anything like equal terms. It would be just as absurd to expect the professional oarsmen to compete on equal terms with the student in solving mathematical problems and translating Greek and Latin into English, or with the clerk in bookkeeping, penmanship, or typewriting.

When, however, sports and pastimes are pursued with so much intensity as ends in themselves, rather than as means to an end, and the devotees spend so much time and energy in their practice that they have none left for other pursuits, these persons are just as much professionals in the true meaning of that term as they would be if they received money for their services. This is the type of athlete that has been supported and exploited in the past by some of the large city and university athletic clubs. Although they have won prizes for their clubs, we can hardly believe they have won honors; indeed, we are sure that this style of athleticism has done great injury to the cause of physical training. This injury has been wrought, first, by placing all the records so high that bona fide amateurs will find great difficulty in surpassing them; second, by discouraging and literally driving out of existence the smaller clubs that cannot afford to follow the same tactics; third, by causing a decline in active interest among the members of these clubs who cannot spare the time and attention from their business that will enable them to compete with the performances of star athletes, and who, therefore, do not compete at all. So long as the public is content to see the best performances without regard to the

status of the competitors there will always be a tendency toward professionalism which will have to be guarded against by very stringent rules. One of the best ways of meeting this objectionable tendency in school and college athletics is for the authorities to insist that all contestants must not only attend to all their school and college exercises but must also give evidence of having done a certain amount of work and attained a certain rank therein. If the school curriculum is what it should be, this will insure that the students will not give too much time to their athletics, and that the work that they do engage in will tend to give them sound minds as well as strong bodies.

We have dwelt at some length upon this tendency of antagonistic sports and highly competitive games to exterminate themselves when not properly managed, because we deem it of the greatest importance that this fact should be thoroughly understood. It is useless to deny that athletic contests afford a stimulus to physical effort to a great many boys and young men, and even to girls and young women, which no other form of exercise can give. The problem is how to control these sports and yet keep up the interest, how to eliminate the evil and yet preserve the good. We have seen that when competition

was restricted to one class, school, or club, hostile factions were formed and bitter rivalries engendered. Much of the hard feeling and enmity that existed between school and college classes years ago, when the practice of hazing was in vogue, was greatly intensified by class contests in football, rope pulling, and cane rushing. This feeling of enmity between classes is now fortunately a thing of the past in most institutions. We are not so sure, however, that it has not been transferred in an intensified form to rival schools and colleges, if we may judge from the nature and tone of some of the alumni speeches that have been reported occasionally. The rivalry in antagonistic games in many of our schools and colleges tends too often to become so fierce, and the desire to win so overpowering, that there is not a little danger that amicable relations between some of these institutions may at times be overstrained.

When we ask a friend to assume to be an enemy in order that we may arouse our fighting spirit and practice our animal instincts upon him, it is not a little strange that the imaginary attributes which we repeatedly give to him are after a while difficult to efface. This is especially true if the fancied realism adds so much to our fierceness of attack and defense as to enable us to win a victory. A man instinctively

shrinks from falling upon another man's head under the ordinary circumstances of life, but a man so considerate of an opponent's head or person would not make a successful football player. When the papers were filled with denunciations of the West Point cadets for their rough and cruel practices upon under-class men, it did not occur to the general public that these are qualities that must necessarily be bred in the man who would become a professional soldier. A much more agreeable way for us to become reconciled to the stern qualities in our young men, especially if we wish to raise an army, is to attribute these rough, cruel, and even fiendish qualities to those who happen at the time to be our enemies. By attributing diabolical qualities to an opponent we may excuse ourselves for trying "to do him up" or "to put him out of the game." These are, however, simply the remnants of primitive characteristics possessed by our early ancestors, when those who were not members of the tribe were enemies of the tribe, and whom it was one's first duty to wound or kill. When rival boxers deliberately try to "knock each other out," and friendly baseball players "spike" a runner or throw dirt in a baseman's eyes; when the fair devotees of basketball hiss every attempt of the visiting team to make

a goal; when grave and dignified professors rush up and down the side lines of the football field shouting "down him," "kill him," and delicate ladies, who but a moment before shrunk from witnessing the "brutal" game, with flushed cheeks and staring eyes wildly shriek their approval, one might reasonably ask if this, also, is not an exhibition of some of the recurrent traits of our barbaric ancestry.

Of course these are exceptional occurrences, but if you have any real doubt as to the passions which are swaying the minds of most of the spectators, as well as the participants, during an exciting football game or boxing match, just watch the faces of the audience during these antagonistic exercises. To be sure there is the joy of victory to the side that wins, and there is also the chagrin of defeat to the side that loses, and it is a question whether or not the prolonged depression that follows defeat does not more than offset the temporary pleasure of victory. It is certainly true that the feeling engendered between institutions by violent athletic contests does not tend to unite them, although harmonious relations and unity of spirit seem altogether desirable. We have seen that when athletic contests were confined to the members of different classes in the same institution the rivalry became intense

and the spirit bitter, and that the only way to relieve this tension and hard feeling was to unite in competition against some other institution. As this movement, which has now been in operation for twenty or thirty years in some of our colleges, is beginning to breed the inevitable bitterness of feeling that sometimes finds expression in a phrase that consigns a whole institution to the infernal regions, the question arises whether or not these rival colleges can unite against some common enemy or institution and thus work together in harmony. The union of Harvard and Yale against Oxford and Cambridge in their athletic games in England, and of the American team at Paris and at Athens, are illustrations to the point.

In arranging for international contests to take place every four years, in which the winners in the intercollegiate contests could be represented, a new interest and a new zest would be given to athletic games, and their real significance might be brought home to our people, for they would soon learn that this was one of the best means of preserving our national unity. The rivalry that exists between nations is a fundamental one, and is based largely upon differences in race, blood, nurture, and environment. There is no natural rivalry between states,

cities, and institutions in our country founded upon the personal qualities of those who were born, bred, and educated therein. Would that there were! A city baseball nine or a college athletic team may be made up of representatives from all parts of the country. Whether these men are successful athletes or not will depend largely upon their own superior natural abilities, their previous training, and the way in which they are handled or managed. Why a city, a college, or a community should pride itself upon the achievements of a baseball nine or an athletic team which it never produced is one of the things that is difficult to comprehend. The only justifiable ground for any such pride would be that these athletic teams represented the return of a system of physical training open to all, in which the victorious athletes had to fight their way up, step by step, through preliminary contests until they had won a place on the boat crew or university team. And even then the only thing in these prolonged contests worthy of recognition by a great university would be the triumph of better blood, better brains, better hearts, better lungs, better nerves, muscles, and tissues. If the totality of these valuable essentials to life, health, happiness, and success has not been increased in the college community at large by the influence of

athletics, then these much-lauded exercises may be considered not only of doubtful value but even of positive injury to an institution of learning. Happily the average physique in our secondary schools and colleges is improving slowly.

At the present day every alumnus rejoices in the athletic victory of his school or college team, because he thinks the public will consider the achievements of this team a fair representation of what his institution is doing for the physical training of its youths. How seldom this is true! In intellectual training all school men are required to come up to a certain minimum standard of excellence before they can enter college, and again before they can receive their diplomas. There is no such incentive to keep the mass of students up to a required physical standard, and the gulf between the lowest and the highest is great indeed. A few years ago the college gymnasium directors, believing that a moderate degree of physical strength was the fundamental basis not only for all forms of athletics but even for health itself, decided upon a uniform system of strength tests by which to gauge certain functional powers in their respective pupils. The test consisted of an all-round trial of strength of back, legs, arms, and chest, in which the sum total of the several trials

was to represent the total strength of the individual. After the candidates for all the athletic teams have been chosen, a great many men who desire to have something definite to compete for are left without any incentive. One object of the college strength test is thus to furnish an incentive for a large number of men to keep up their physical exercise by giving them an opportunity to record their improvement and compare it with that of others measured by the same standard.

The method adopted has been in use in some of our colleges for over twenty-two years, and now offers a basis of comparison between two generations and between the individual records of over twenty-five thousand persons. In order to encourage a great number to compete, every college in the league agrees to send in to the committee a list of its fifty strongest men, and the college having the fifty which make the largest total wins the highest honors in this contest for the year. One year Columbia was first on the list with a total of 59,489.4 points, in which each of the fifty men represented averaged 1157.2 points. Now the fact we wish to bring out is, that notwithstanding the high average made by the first fifty who represented Columbia and the other colleges in the league, in all probability the

average of all the men examined would not be much over five hundred points. In other words, fifty per cent of all the men examined would fail to make a strength test equal to half of that surpassed by the first fifty; while if we make comparisons with the individual men who headed the list, we find that over half of all those examined failed to make a test equal to one third of that attained by the leaders.

These facts prove three things, — the stimulating effect of a comparative record or contest upon a considerable number of men, the remarkable increase in functional power that may be attained by systematic training, and the large number of college men who never begin to realize one half of their possibilities in the way of physical improvement.

The great objection, however, to all forms of athletic competitions and strength contests is, as we have stated before, that after a while, as the standard rises, they are likely to be pursued as ends in themselves, rather than as means to an end — the betterment of the whole organism. Unfortunately, however, this objection is applicable also to mental contests, and in both instances those men come to the front whose constitutions are best adapted to stand the strain to which they are subjected. By this method of selection our higher schools and colleges

are fostering two distinct types. One type devotes itself to the supreme development of the mind, and the other type to the supreme development of the body. The latter type is best calculated to survive, because it has to meet certain minimal mental requirements of the faculty; but neither type represents the average student, and yet it is his condition that shows what our schools and colleges are doing for the country.

The more experience we have in teaching physical training and the more we observe its results, the more we are convinced that the highest ideal for which we should strive is the improvement of the individual man in structure and in function. This was the conclusion to which I came some twenty-five years ago, and time and experience have confirmed it. With this ideal in mind, all the diverse forms of exercise and games, all fads and specialties, all methods and systems, may be weighed in the balance and credited for what they are really worth; for it is not a runner, a jumper, a boxer, a ball player, an oarsman, or a gymnast that we are trying to produce, but the highest type of a physically perfect man, and this forbids that excessive development in any one direction, which specialists are constantly striving to attain. It also makes over-exercise and over-training inconsistent with the

object in view, and it furnishes a constant incentive to well-directed efforts and right methods of living. It is not necessary to hunt for a competitor, for one is always in competition with himself, endeavoring to make his condition to-day better than it was yesterday, and so on from week to week and from month to month. If one wants an opponent, he accepts him as a friend; for, as Burke says: "He that wrestles with us strengthens our nerves and sharpens our skill. Our antagonist is our helper."

The great thing to be desired and attained is that prime physical condition called fitness — fitness for work, fitness for play, fitness for anything a man may be called upon to do. Is not this a condition worth striving for? How few of us who are engaged in physical education realize the dignity and importance of the work! It is that of trying to assist Nature in developing and perfecting her handiwork, not simply mending bones, patching wounds, and relieving functional disturbances, but trying to lift man to a higher plane of living by improving the structure of his bones, muscles, nerves, and tissues, and by increasing the functional capacity of his whole organism. This is the highest kind of constructive work, in comparison with which the building of all other material structures sinks into utter

insignificance. If there are those among us who sometimes get disheartened and discouraged because we think this particular branch of service is not duly appreciated, we trust they will let this ideal take possession of them.

Drink into your very soul the true aims and noble purposes of your profession; then if you do not feel inspired to go on with your glorious work with renewed courage and greater energy, you are not made of the stuff of which good teachers of physical training are made. If you do become possessed of the true ideals all your work will assume a new significance to you. Balls, bats, wands, Indian clubs, dumb-bells, chest-weights, ropes, ladders, bars, and all the apparatus of the gymnasium will take on a new importance.

Free exercises, dancing steps, plays, games, "sleights of art and feats of strength," and even the schoolboy's "stunts," will all be brought under tribute and made to aid in getting hold of some indifferent soul, to induce him to make efforts for himself. All criticism against childish sports, trivial plays, and undignified movements and exercises will simply be laughed to scorn, for what dignity has any movement or exercise except the dignity of the mind that directs it? Something of this spirit must have

possessed the minds of Agesilaus and Socrates of old, who did not disdain to practice the child's play of "riding a stick" for exercise.

It is the same spirit that induces many business and professional men whose brains are overworked, and many closely confined clerks and shop girls, to take regular systematic exercise at their homes or boarding places, when golf, tennis, the bicycle, and the gymnasium are inaccessible, and we regret to say that it is a lack of this spirit that puts so many of our college athletes out of condition after they have entered upon their life work. Finding no opportunity to practice their favorite sport, they feel no incentive to take exercise of any kind, and frequently break down in health for want of it. There are scores of such men in every city to-day, and their early breakdown is not infrequently attributed to over-indulgence in college athletics. In some instances this may be true, but the fundamental weakness in the whole athletic movement at the present time is a failure to recognize the primary objects for which athletic exercises are fostered and encouraged, — in other words, a failure to recognize proper standards and high ideals.

In consequence of this difference of aim and motive many of us are kept busy protecting students

against the excesses of some form of athletics while in college, and defending athletics against the attacks of some students after they leave college. If, therefore, we would preserve exciting games and competitive exercises as a part of our stock in trade as a means of physical development, we must be constantly on our guard to detect abuses and withstand excesses. If, on the other hand, we would avail ourselves of the many excellent exercises which from their nature are not likely to be carried to excess, we must never weary in our efforts to arouse in our pupils an ambition and incentive to try them for the development of their own better selves. This is the vital principle back of all our work, and if the teachers of physical training will imbibe a little enthusiasm for physical perfection for its own sake, and put a little of the spirit of helpfulness into their daily work, they need never despair of appreciation or employment, for the world is waiting for their efforts. With these ideals in view we may in the future look for the advancement of our cause with reasonable hope and joyous expectation.

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