Butler (D. P.)

D. P. Butler

THE LIFTING CURE.

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BUTLER'S SYSTEM OF HEALTH-EXERCISE.

THE LIFTING CURE:

A

SCIENTIFIC APPLICATION OF THE LAWS OF MOTION

OR

MECHANICAL ACTION

TO

PHYSICAL CULTURE AND THE CURE OF DISEASE.

By D. P. BUTLER.

The function of a true physician is to prevent and cure disease, by teaching, applying, and obeying natural laws.

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THE LIFTING CURE.

BUTLER'S SYSTEM OF PHYSICAL TRAINING, ADAPTED TO STRENGTH AND HEALTH CULTURE, AND APPLIED TO MEN, WOMEN, AND CHILDREN.

THE TRUE BASIS OF PHYSICAL CULTURE.

A HUMAN being is made up of organs; and the manifestations of the various mental and physical powers depend upon and correspond with the condition of those organs, whether weak or strong, healthy or diseased. Hence, whatever will secure the greatest degree of strength, vigor, health, and perfection of the physical organization, should be adopted and applied by all, as the first and most important duty of life.

Action is life, power, success. Inaction is failure, impotence, death. Proper action is health, vigor, and the condition of long life. Hence, to comprehend the law of action is the basis of all physical, mental, and moral progress. The mechanical law, the law of motion or action, is the primary, fundamental law of the universe, man included. The laws of vitality, electricity, and chemical action, originate in and are subject to it. It is the law of creation and destruction, of life and death. As development, health, and longevity are the reward of obeying the laws of man's mechanism, so degeneracy, disease, and premature death are no less the legitimate punishment of their violation. Hence perfect obedience is at once the highest duty and greatest necessity.

MAN A MACHINE.

Physically, a human being is a machine; and, being the highest type of organization, is, of necessity, the most perfect machine. The perfect action of the steam-engine depends upon the quality, form, and adjustment of its several parts. These conditions being defective, the action of the machine is imperfect. The same principle applies to man. Perfection and proper adjustment of the parts or organs, obedience to the fundamental law of mechanical action, is strength and health. The reverse is weakness, disease, and premature death. The more perfect the machine, the more delicate in adjustment and complicated in structure, the more serious are the consequences of any violation of the laws of its mechanism. Taking mankind as we find them, weakness and disease is the rule, health and strength the exception. The reverse is the natural order. Hence it is clear that the mechanical, hygienic, and psychological laws which govern man's existence, growth, and culture, are violated. We require, therefore, a system of mental and physical discipline which will put man in harmony with those general laws. The Lifting Cure, a scientific application of exercise with heavy weights, furnishes such a system of treatment.

This system strengthens the weak organs, and expels disease by a graduated, co-operative exercise of the whole body. The weak organs, by the use of weights which tax their power largely, gain strength, proportionately, more rapidly than the strong and healthy parts, to which the same weights give only a moderate exercise. Moreover, since all parts of the body sympathize one with another, in health or disease, the weak parts are aided in their effort to become stronger by the increasing vitality of the system in general. Thus the strength of the whole body is augmented and equalized, the weak parts are built up, disease is expelled, and the individual becomes uniformly strong, and consequently healthy.

THE PROPER USE OF HEAVY WEIGHTS.

In referring to the use of heavy weights, we do not mean such exercises as have been practised in ordinary gymnasiums; nor such as are applied to developing special power, as illustrated in the training of prize-fighters and acrobats. These result in an unbalanced and consequently unhealthy condition. This is demonstrated by the fact that they are usually short-lived. Nor do we mean the use of a weight which exceeds the power or endangers the safety of the patient under any circumstances. A weight of ten pounds may be very heavy to one person, while a weight of five hundred pounds is very light to another.

All methods of lifting on the principle of raising one end of a scale-beam, or where the weight is taken abruptly from an unyielding surface, without the use of the spring, render a thorough co-operation impossible; for it is evident that the greatest effort is at the instant of raising the weight, which, being taken suddenly, of necessity finds some parts of the body prepared to receive it, while others fail to act in co-operation. The weight thus suddenly taken is heaviest at first, requiring less exertion as it rises; while the contrary is the only safe and natural method of action. In this manner, injurious strains and unnecessary soreness are induced, and the internal action resulting in vital development cannot be secured.

HAND-LIFTING, WITH PROPER APPARATUS, THE ONLY CORRECT METHOD.

But the lifting of properly graduated weights by the hands, with an apparatus constructed on scientific principles, is the only safe, efficient, and thoroughly co-operative exercise. Its beneficial effects have been demonstrated in our practice in hundreds of cases. The adjustment of the weight is so perfect, the action of the spring so effective, that sufficient time is given

to secure a completely co-operative action of the whole body; each part sustaining its proper share of the weight, and all acting in perfect harmony. In hand-lifting by our method, as the weight is slowly raised from the spring, it is first received by the leading external muscles; then, through increased co-operation, by the whole external muscular system; then, in order, by the muscular attachments of the vital organs, and the muscular coatings of the organs themselves: so that not only the external muscles, but every part of the system, from head to foot, is called into harmonious and combined action, even to the minutest muscular fibre of the coating of each artery and vein and every internal organ. This action, from its first influence on the leading external muscles to its final perfected influence on the vital organs, is continually increasing in perfection, owing to the more complete co-operation secured at each succeeding stage. Thus exercise in accordance with this system develops power chiefly at the vital centres; the co-operation being more perfect, and the action more evenly distributed and harmonious there, than on the external muscles which first receive its effects. The brain and spinal column, as well as the other vital organs, partake in this action. But if sufficient time is not taken in the raising of the weight, which is impossible without the use of the spring, it is heaviest at the first effort, requiring less exertion as the effort is continued, thus reversing the natural order. The result is, that a few leading muscles are alone affected, and these become excessively developed while the vital centres are neglected. By the proper method of hand-lifting, we not only obtain complete co-operation by means of the spring, but secure the perfected, powerful action of the dead-weight, when the weight is raised above the spring; with the additional advantage of protection against strain and injury, secured by co-operation. Thus we combine every advantage, with none of the disadvantages of dead-weight and spring-lifting, in a natural and complete exercise.

COMPLETE DEVELOPMENT IMPOSSIBLE WITHOUT TRAINING.

In a healthy organization, size and symmetry, or quantity, and balance of power, are the first and most important conditions to be secured by training. Then, in natural order, maturity and refinement follow. Complete development is impossible without training, or, in other words, proper mechanical action. A true method of physical culture is as necessary for the body as a correct mode of intellectual culture for the mind. Both are *natural*, provided for in the original constitution of man. As no man can be in the highest sense a natural man without moral, social, and intellectual culture, so none can be truly natural without proper physical culture. We can safely suppose that none but the ignorant will object to scientific physical culture as being unnatural; while many of those forms of exercise which might be considered as natural by the ignorant, are really violations of natural law,—a kind of physical drudgery pertaining to our unnatural and imperfect condition of life.

Physical training should commence with childhood; and the kind of exercise should be in harmony with the natural and fundamental law of youth, which is development, or growth. The proper use of heavy weights is the agency for developing size; while slow and co-operative action secures the next important condition,—balance, or symmetry. Hence we find that those who have been trained in light gymnastics do not develop power as successfully as those who have never trained at all. Thus the use of light weights and ordinary modes of heavy gymnastics produce certain conditions which limit development; as, by these methods, only the external muscles are developed, at the expense of vital power and symmetry. As, in all things, size, other conditions being equal, is the measure of power, any thing which limits *harmonious* development must necessarily be objectionable.

DANGERS OF EXCESSIVE MUSCULAR DEVELOPMENT.

In all prevailing false methods of physical culture, the tendency is to develop large external muscles, especially about the extremities. Many young men, totally ignorant of the laws of exercise, commence training with a desire to secure this excessive and abnormal limb and muscular development. So also, by a leading method of light gymnastics now common, especially among our young ladies in their boarding-schools, aided by pedestrian exercise, a great development of the lower limbs is produced, necessarily at the expense of vitality and true symmetry. If the power thus expended were applied to increasing the size of the contracted waist and chest, and the power of the vital organs, we should hear of fewer instances of premature sickness and death among the pupils and graduates of these institutions. But, if this abnormal development is the object of physical culture, it is easily obtained. We have only to apply a series of long-continued limb exercises, with sharp, severe action of the leading muscles, and we shall thus secure an excessive development in these directions; but the result is inevitably injurious. By an abnormal development of the limbs and leading muscles, the vital centres are robbed of their power, and the doors are thrown open for the entrance and development of the long train of diseases to which the human system is liable; and when a person thus trained is attacked by disease, the power needed to combat it, instead of being present at the vital centres, is drawn away to the extremities. Hence the liabilities to a fatal termination of the disease are greatly increased. In confirmation of this, we find acrobats, prize-fighters, and all cases of abnormal muscular development, short-lived and unhealthy, as a rule. When attacked by fevers and all acute diseases, to which they are especially liable from their lack of vital power to resist them, for the same reason they sink rapidly, and die suddenly. But a proper system of training

will develop power primarily at the vital centres, securing a subordinate but harmonious muscular development.

PROPER TRAINING A REVOLUTION.

When a person goes into training, he goes into revolution; and, if abnormal conditions exist, he will pass through the revolution of disease as well as of development; for he cannot add to the power of his organs without a tendency to use that power to expel whatever disease may be lurking there. The entire disease may only be expelled by the utmost of power. Therefore the revolutions of development and the cure of disease go on hand in hand till the maximum power is attained. Then, in natural order, comes the reward of obeying the fundamental law in reference to development,—freedom from disease, capacity to enjoy, with the additional luxury of the refining of that power, or the ripening peculiar to healthy age.

NECESSITY OF GRADUAL DEVELOPMENT.

Man is a machine; and, in training, he must be called into action in accordance with the principles of his mechanism. One of the essential rules in using machinery safely and efficiently is to apply very little power at first; the primary object being to call the parts into slow, harmonious, co-operative action. Having started the machine, and secured the general co-operation, then a little more power is added to increase the speed; then a little more, until such a degree has been attained as the strength of the machine will warrant. It is possible to run a locomotive at the rate of a mile a minute: but it does not pay; it wears the road and the machinery to a degree which no receipts, however large, will justify: the ordinary rate is thirty or forty miles an hour on good roads. So that which is the law of safety and success in the application of inorganic power, is the law of economy in a still higher degree in the development of the human system. Hence, when a

person begins training, he should use weights largely within his power, and increase them moderately, taxing his strength a little more in proportion as he advances from week to week; and not until he has been in training at least three months should he presume to use all the power at his command. It takes fully that length of time to insure that complete co-operation and the use of all the parts which enable them to perform their functions properly in the use of power in co-operative action.

If, by reason of want of vital power, or a forced, unnatural system of culture, the natural order of development is interfered with, when the person commences training, and develops a greater degree of power, this is at once directed to the perfection of the physical organization. Nature will never rest contented until her processes are accomplished; and when she has been restrained, and development has been arrested, with each increase of power she will surely apply it, in the natural order of progress, to the completion of the work already begun. If other processes are now going on, they may be arrested until this result is accomplished. Thus, through a series of actions and re-actions, a natural order of development is commenced and carried on until the desired end is reached.

THE ORDER OF DEVELOPMENT AND CURE.

The first result of the exercise is to equalize, the second to invigorate, the third to reconstruct and build up the tissues of the body. In the process of continued training, these results are inevitable, and they necessarily involve the expulsion of whatever disease is present in the system. With equalization and invigoration, among the first apparent results of the exercise is the securing of a more perfect circulation throughout the tissues, and toward the surface, of the body.

BEAUTY AND ENERGY RESULT FROM PROPER TRAINING.

The skin, which had been clogged with decaying matter, yellow with bile, or white for lack of capillary circulation, acquires the natural glow and color of health. Though the patient may not increase in actual weight, the face becomes fuller, and rounder in its outlines (the uniform and natural indication of vigorous vital organs), and acquires that beauty of form, and lively and animated expression, which can only result from healthy physical, mental, and moral conditions.

Nor is the effect upon the general tone and character of the mind and will less apparent. The vacillation and weakness peculiar to an unbalanced condition come to an end. The step is firm, and the will determined. Consciousness of power underlies and promotes all the elements of a perfect manhood and womanhood. Persons who have vainly grappled with health-destroying habits, or who, in consequence of the weak and abnormal condition of their mental faculties, have had no desire to resist them, may now oppose them successfully. During our practice, we have had many patients who have given up the use of tobacco and intoxicating drinks, who had tried and failed in their previously weak and diseased condition.

AN UNERRING DIAGNOSIS OF DISEASE.

As weakness precedes disease in every part or organ of the body, and as the body is practically no stronger than the weakest part, a thoroughly co-operative exercise will detect and point out the weak and diseased organs with unerring accuracy; and with the development of a sufficient degree of power, varying in different individuals according to their natural constitution, strength, and susceptibility, the curative process is begun. The patient, who has at first experienced the grateful effects of equalization and invigoration, may now develop a degree of soreness and pain in the diseased organs, or their

nerves, reporting in other portions of the body. At the same time, the disease, if chronic, becomes acute in its symptoms; the system is aroused to unusual action; and what we term a crisis of the disease is produced. The patient's power, developed by systematic culture, is now turned, in a natural and orderly way, to expelling it from the system. This is indicated by the fact that the patient is unable to lift his heaviest weights with as great ease as formerly,—frequently unable to lift them at all. Upon the development of this condition, the attendant physician should allow the patient to use only such weights as are fully within his power, regulating the action and varying the application according to the symptoms as they are developed from day to day. The power of the patient should not be tested to the utmost until the curative process no longer requires it for the present; which is indicated by an increase of general vigor, and a tendency to lift heavier weights.

THE CURE OF ORGANIC DISEASES.

In thus claiming to cure disease, we use the word "cure" in its ordinary acceptation. There may be difference of opinion among physiologists as to whether real organic diseases can be completely cured; but there is no doubt that they can be reduced to a minimum, so that their liabilities to encroachment upon health and life are scarcely more than in case of absolute cure. At every step of the constant increase of organic power developed by training, the disease is brought under more perfect control, with ever-increasing tendencies to complete eradication. Hereditary diseases remain many years, and often for life, in the system, in a germinal condition; but, on the contrary, always develop and crop out when the person becomes sufficiently weak. Cancers, tumors, and, in general, all humors of the blood, morbid matters accumulated in the system for want of organic power to resist and expel them, appear in a malignant form only when invited by a weak and debilitated condition of some part of the system. With suffi-

cient power, Nature would have expelled them gradually through the ordinary channels. This power is given by training; and their acute manifestations are thus prevented. It becomes an interesting question, whether this building up of the tissues, and developing of organic power, by proper training, especially if applied in the first stages of the disease, may not supersede the application of surgery. We have no doubt that, in many cases, such would be the result.

BROKEN BONES, WOUNDS AND INJURIES.

In all cases of injury to the person, when the application of the treatment is possible, a systematic course of training should be adopted. The increased power, and more perfect circulation, will assist the processes of Nature, relieve pain, and effect a cure, much more surely and rapidly than by ordinary methods. In accordance with the principles by which chronic diseases are cured, in cases of injuries which occurred long before the patient commenced training, and which were healed to the extent of the power then existing in the system, there will, with every decided increase of power developed in training, again be manifested acute symptoms, and the healing process will be renewed, until, finally, the part affected becomes equally strong and healthy with other portions of the body. We have had many instances of this kind in our practice, where injuries long forgotten have been developed, and the previous partial cures made permanent and complete.

PRACTICAL RESULTS IN APPLICATION.

However perfect our theory of disease, of its nature and cure, may be, we are aware that its success depends upon its practical results in application. In a large number of cases, including patients of all ages and both sexes, we have treated many diseases, both chronic and acute, with uniform success. The treatment has been particularly effective in cases of chronic dyspepsia, catarrh both chronic and acute, and diseases

of the liver and kidneys. We have treated many cases of this kind, and have never failed to relieve or cure.

Cases of neuralgia and chronic inflammatory rheumatism of ten or twelve years' standing, which the most skilful physicians in Europe and America have failed to relieve, have yielded to this natural remedy, which secures equalization and organic power. All kinds of nervous diseases and weaknesses caused by an excess of nervous or brain action, are radically cured by this method.

We have been very successful in treating many cases of rupture and hemorrhage, when one not comprehending the philosophy and method of application would suppose that the treatment would increase instead of lessening the difficulty. We have had several cases of hernia; and, by increasing the strength of the abdominal muscles and adjacent parts, the tendency has always been to relieve the patient.

In cases of incurable consumption, accompanied by hemorrhage of the lungs, our treatment has operated very favorably in lessening or stopping the hemorrhage, in equalizing the vital forces, and, as we believe, in prolonging life.

Contrary to what may be commonly supposed, we have been unusually successful in treating female diseases and weaknesses, owing, probably, to the fact that women and girls are unaccustomed to the use of nearly or quite all their power, and to ordinary, heavy manual labor long continued, which injures the tones of the organs, and renders them less responsive to curative agencies. The temperament of females also renders them more sensitive, and more easily invigorated by proper training. The diseases and weaknesses to which females are peculiarly liable, are, moreover, chiefly of a nature resulting from want of equal and sufficient action; while those affecting men and boys more generally result from excessive action. Falling of the womb, and female weaknesses in general, accompanied by the worst forms of uterine hemorrhage, we have, in many instances, relieved and cured.

Hemorrhage can rarely occur unless it is preceded by con-

gestion and weakness of the affected part, and want of equalization and functional vigor. Training equalizes the circulation, removes the congestion, gives power and regulated action to the organs, and prevents hemorrhage by removing its cause.

Incipient consumption may be prevented from further development by this treatment; and scrofula and all forms of unhealthy humors are removed, the morbid matters being expelled through the skin and natural channels of evacuation. We have no doubt that cancers and tumors may thus be prevented, or, in their early stages, arrested in their development; thus, in such cases, avoiding the necessity of surgical operations. We question whether, in the advanced stages of many diseases, as, for instance, cancer and gravel, this increase of organic power may not produce sufficient action to arrest the formation of and disintegrate the morbid accumulations, and expel them from the system. While we have little or no faith in any direct chemical effect or partial and local action of the organs in the cure of disease, we have unbounded faith in the inherent power of strong and regulated action of all the organs. Man's chemistry kills: God's chemistry cures.

Constipation, indigestion, and irregular circulation,—the causes of piles,—are surely prevented by proper training; and thus they may be readily relieved and cured. Fevers, in their early stages, may be prevented from becoming seated. We have thus treated typhoid and lung fevers, frequently relieving the patient by a single exercise. Pleurisy, and acute pains in general, including headache, toothache, and rheumatic pains, are frequently cured by a single exercise.

Mineral and vegetable poisons long contained in the system have been developed with all the symptoms of recent introduction, and expelled by training. All kinds of bruises and injuries to the person heal more rapidly, and with less pain, with training, than they could without, owing to the more powerful and equal circulation and vital force.

Thus it is evident that an increase of general organic power

and equal action, with obedience to all hygienic laws, is the best and most efficient method of cure. This power can be developed only by a correct system of physical training.

THE TWOFOLD CULTURE OF THE BRAIN.

The brain is, first, a physical organ,—a part of the physical body,—and subject to all the laws of physical culture and growth.

It is, secondly, the organ of the mind,—a combination of numerous mental faculties, depending upon their special action for special mental culture.

A true philosophy of physical culture includes also a true philosophy of mental culture. Our system of physical training develops brain-power both directly and indirectly,—indirectly through the increased power and vigor of the body in general, and directly by the especial and vigorous action of certain mental faculties.

The faculties of self-reliance, firmness, concentrativeness, hope, courage, faith, and many others, are directly called into powerful action; and, in accordance with the laws of all organic growth, they must and do increase in power.

While these faculties are called into direct action during training, the brain as a whole, and every part of it, partakes of the general equalizing and invigorating influences affecting the whole body. The brain, as a whole and in its several parts, being the organ of the mind, the physical agent through which the several faculties are manifested, and subject to all the special laws of culture and growth recognized by phrenologists, is none the less a part of the physical body, depending equally upon its general laws of development, growth, and culture. Hence, whatever will develop the body as a whole harmoniously, restraining abnormal development where it has become excessive, and enlarging the organs where there is a deficiency of size or power, will exercise the same equalizing influences upon the brain. In this manner, we secure a con-

stant and powerful tendency to develop deficient intellectual and moral conditions, as exhibited in partial or complete idiocy; and to remove, by equalization, that excessive and abnormal action of the brain, or of its several organs, which results in monomania or in insanity.

EXPLANATION.

This system of exercise and cure contains essentially three elements, under which are comprehended other minor peculiarities :—

1st. It is a true exercise.

2d. It is a true developing agency.

3d. It is a true method of cure.

Being a true exercise, it is necessarily a true developing agency; being a true exercise and a true developing agency, it is necessarily a true method of cure; and a true exercise, a true developing agency, and a true method of cure, necessarily involve the utmost of strength and health.

The object of the system is, primarily, to secure strength at the vital centres; to develop power in the vital organs, the spine and brain; and, subordinately, to secure a harmonious and symmetrical development of the muscular system. Other methods, on the contrary, tend chiefly to muscular development, and do not especially add to the vital power. If the muscular system is developed to an excessive degree, it robs the vital and nervous systems of their force, and prepares the way for disease.

We secure this uniform development of power and health by the scientific application of the law of mechanical action, through the use of machinery adapted to that purpose. Why should not machinery be adapted to this purpose? This is pre-eminently the age of invention and discovery. Intelligent labor was never before so honorable. Brain labor is fast superseding physical drudgery. By the invention and use of machinery, the civilized world is fast being revolutionized

and reconstructed. Every thing is being done better and more profitably by machinery than ever before. Productive energy is increasing with the speed and capacity of mechanical action. But commerce, agriculture, and manufactures must not monopolize the use of machinery: we propose to apply it directly to the culture of man, physically and mentally. The physician and teacher, not less than the mechanic and farmer, must call machinery to their aid. With all this increase of capacity for labor, time becomes much more valuable. Men cannot afford to occupy hours in securing exercise through the usual forms of manual labor or the old systems of gymnastics, when better exercise can be obtained in ten or fifteen minutes, two or three times a week, by the use of machinery.

In application, the order of development of strength and health by this agency may be stated thus:

First. It is an equalizer.

Secondly. It is an invigorator.

Thirdly. It is a reconstructor of the tissues of the body and the brain.

That it accomplishes what we claim for it is attested by the practical results of its application. It is particularly commended to the attention of the public,

1st. Because it is radically different in philosophy, machinery, and application, from any thing heretofore known in gymnastics or other modes of exercise and cure.

2d. It is an original, scientific system of mechanical action, or motion, adapted to the growth and development of man in his normal condition, and as the curative agency of his abnormal condition,—equally applicable to men, women, and children; making the weak strong, and permanently curing disease and deformity.

3d. The system, in its practical application, is *complete;* reaching every organ and fibre from head to foot; arousing all those parts which are weak or diseased; strengthening and preventing disease in the former, and expelling it from the

latter; thus securing strength, health, and symmetry by the same process.

4th. It is *exact*. No known mechanical law is violated, and all are obeyed; making the best possible use of all existing power as an invigorating, reproducing health and strength agency; surely guarding against the liabilities to strain and exhaustion peculiar to those systems of exercise which violate mechanical laws.

5th. It is *co-operative*, in each exercise calling into regular, harmonious action as many parts as possible; the strong supporting the weak, and all together putting forth their power, proportionately distributed, but combining in one co-operative effort. This is the best and only safe manner of exercise for all classes, weak or strong, sick or well, old or young.

6th. It is *graduated*, in all the exercises, carefully adapting the weights and the duration of the exercise to individual needs, rendering it perfectly safe and agreeable even in the most delicate cases. None are permitted to attempt the use of weights beyond their power of thorough mastery, nor for a longer time than is necessary fully to call forth their latent power; thus preventing exhaustion, and uniformly invigorating.

7th. It is *properly applied*. Each patient is personally superintended by a competent instructor specially educated and experienced; while the apparatus, in design and construction, combines simplicity and completeness in the highest degree, thus insuring safe and efficient treatment.

8th. It invokes *all hygienic agencies*, especially pure air, pure water, healthful food, sun, air, and water-baths, abundant sleep, rest, and recreation.

9th. It is *successful in practice;* accomplishing results in strengthening the weak, and permanently curing disease, heretofore unknown either in physical culture or medicine.

The first effect of these exercises is to bring the individual into proper form and shape, so that there shall be no unnat-

ural mechanical obstructions to the free and normal exercise of his organs.

The second is to create functional vigor, and thus to expel disease, and prepare for development.

The third is to reconstruct and build up the tissues of the organs, and cause an absolute organic growth.

The fourth is to increase the healthy action and power of the brain and mind correspondingly with that of the body. Consequently, all the elements of a perfect manhood are increased, including not only intellectual vigor, but moral power and social purity; for, as certainly as disease favors an abnormal condition of the mind as well as the body, so surely does an increase of health and strength become a promoter of virtue.

LIFTING.

The lifting apparatus comprises a substantial table, through the centre of which passes an upright rod, upon which the weights rest. This rod is raised or lowered by means of a screw, to obtain the exact height for the most perfect leverage for each individual. The screw passes through a nut resting upon a rubber ring, which is attached to a spring resting upon the table. Underneath the platform is a series of semi-elliptical springs, which are depressed as the weight is taken upon the body. Between all the joints of the machine is inserted an artificial cartilage of rubber, which, with the springs, prevents sudden and abrupt action or strain, and brings the apparatus in harmony with the individual. Each of the four legs of the machine rests on solid balls, bedded in rubber at top and bottom, thus allowing perfect freedom of oscillation, and harmonizing the action of the machine with that of the body, in lifting. The lifting-bar, which, with all the apparatus, is patented, is so adjusted, that the hands, acting in opposite directions, receive the weight upon a mathematical line passing through the centre of its bearing; thus securing perfect adjustment.

In lifting, the patient stands upon rubber plates attached to the platform of the table, directly over the upright rod, which is surmounted by an eye, or socket, containing a pivot directly over the centre of the weight. Through this socket passes the lifting-bar,—a wooden cross-piece padded with buckskin, adapted to the form of the hand, and so adjusted, that the pupil, grasping the handles as he stands astride the bar, with his spine directly over the rod, his shoulders in a perpendicular line with the hips and feet, and his head thrown back, takes the weight upon a straight line passing along the handle, and through the centre of the pivot on which the handle is pressed. Thus the mechanical law relating to the adjustment of the weight to the body by means of the cross-piece is fulfilled, and the weight bears equally on every part of the body. It is important for all these conditions to be fulfilled, that the effect upon the body may be perfect and complete. In our earlier experiments we tested thoroughly the effects of lifting by means of side-handles and rods, but finding that it precluded a perfect centralization of the weight and allowed an unguided lateral swaying movement, favoring a forward projection of the upper part of the body with a cross-strain the whole length of the spine and muscles of the back, with unequal action upon other organs, we overcame these difficulties by the invention of the central rod now in use, which centralizes the weight, so to speak, bringing it under perfect control, is conformed to the anatomical predisposition of the body to lift weights in front, as in ordinary labor, and gives to each part its due proportion of exercise. Our experience has demonstrated that the relative positions of the handle, pivot, socket, and rod, with the body, cannot be in any way changed with equally beneficial curative results.

The proper height of the rod, being ascertained upon the first exercise, should be secured at each succeeding exercise by exact measurement. The weight, resting by means of the iron nut upon the spring in the centre of the table, should be raised two or three inches clear of the spring when the body

is erect, and the knees fully straightened. The greatest care should be observed in obtaining the correct position and adjustment of the body, no less in lifting the lighter than the heavier weights. The ankles should be about opposite the rod, the foot supporting the forward hand slightly in advance of the other. The spine should be erect; the top of the shoulders well set back; the centre of the chest fully rounded out; the feet, hips, and shoulders in a perpendicular line; and the weight should be raised very slowly, followed by the spring, until a complete co-operation of all parts of the body has been attained; when the weight is raised free from the spring, and becomes a perfect dead-weight. Then this action is reversed, the weight being lowered as slowly as it is raised, avoiding any sudden or abrupt action. Thus we secure all the advantages, and none of the disadvantages, of perfect spring and dead-weight lifting. There is complete adjustment, thorough co-operation.

The position brings the body as nearly as possible into perfect shape; the manner of lifting distributes the weight co-operatively over the whole body, giving each organ and muscle its proper action, and developing the whole harmoniously. Commencing with a weight not more than half as large as the pupil is to raise at last, he should lift, usually, from four to six times. The first addition should be one-half the total amount to be added; the second, about two-thirds of the remainder; the third and last, always the least. Between the successive efforts of lifting, the patient should take sufficient time to rest, varying from one to five minutes or more, according to the weight lifted; for invigoration follows from successive periods of action and reaction, not from actions following each other in quick succession. This would tend rather to exhaust; but the exercise, as a whole, should, in every instance, leave the pupil invigorated, not exhausted.

Commencing, in the first exercise, with a weight fully within the control of the patient, an addition of from five to

ten pounds may be made on each succeeding exercise-day, until the maximum weight is considerably increased, and the attendant instructor perceives, from the manner of lifting and symptoms of the patient, that he should proceed no farther at present; then, on the succeeding exercise, his highest weight should be reduced about one hundred pounds in most cases, and he should again grade up as before. In some instances, it may be well to grade downward five or ten pounds each day, reversing the process of the ascending grade to the extent of fifty or one hundred pounds. When a crisis is developed, the weights should be varied according to the symptoms and condition of the patient. No invariable rule can be given to apply in every case. The treatment must be as varied as the cases treated. To produce more decided action, the pupil should lift rather quicker, and with shorter rod. The amount of action is determined by the weight lifted; but the manner of lifting determines the kind of effect.

Heavy weights should not be lifted too often. On weights which tax the pupil's power severely, the system of gradation should be varied, so that light weights should alternate with heavy from day to day; and absolute gains should not be made oftener than once in two or three weeks. Very heavy weights should not be attempted as often as this. In training, one cannot be too careful in the adjustment of the apparatus and the manner of exercising, and cannot safely apply it without thorough and competent instruction.