

University on the resistance of gutta-percha bags to acetate-of-lead solutions. It was found that in very thin bags of this material, tiny spots of some proteid substance occur at times, which are corroded by the plumbic acetate, producing pin-point holes. This, however, resulted only when concentrated solutions of the salt were used. Still it is very important to assure one's self that the intra-gastric bag is intact, by pouring the solution into it outside of the body first. Also by using as weak a solution as will suffice to cut off the Röntgen rays. As it is a well-established fact that bone tissue is particularly impervious to this form of light, an emulsion of bone powder suggests itself as a proper substance with which to distend the intra-gastric bag.

### GYMNASTICS IN HEART DISEASES.<sup>1</sup>

BY DR. CLAES J. ENEBUSKE.

THE term "gymnastics" has not acquired a generally accepted definition in the English language, so far as I have been able to learn. A reasonably clear presentation of the subject, the discussion of which, by your courteous invitation, I shall have the honor to open here to-night, depends in no small degree upon an agreement at the outset of the actual meaning of the term gymnastics, inasmuch as it must be one of the fundamental technical terms in my paper. Therefore, I solicit your generous patience with a few general introductory remarks about gymnastics from my present standpoint, before I pass over to my particular subject.

For my present purpose, I wish to define gymnastics from its theoretical aspect as, the attempt to understand the activity of the human body, which expresses itself in its movements and postures, as far as it can be understood by the aid of present biological knowledge, and especially the attempt to understand, as far as possible, their effects upon the body. The results, gathered from these attempts, form the contents of the "theory of gymnastics," if that term may be spoken at present.

I wish to define gymnastics from its practical aspect as, the attempts to utilize the theoretical knowledge of the movements and postures in such a way, that they may become means to serve the purpose of ameliorating the body.

It is, therefore, the definition of the postures and movements, with regard to form and degree of activity for the said purpose, which determines them as gymnastic in contradistinction to others.

Moreover, the selection of such defined postures and movements and combining them in such a way that they together shall yield the best possible results in the desired direction, that is, combining them to what is called in the gymnasium a "gymnastic day's order,"<sup>2</sup> and in the "gymnastic clinic,"<sup>2</sup> a "gymnastic prescription,"<sup>2</sup> is what constitutes a gymnastic lesson or a gymnastic treatment in contradistinction to other forms of physical exercises.

Finally, the substitution at proper time of a given gymnastic day's order or gymnastic prescription by another of modified composition, so as to meet the change in condition of the individual engaged in the gymnastic lessons or receiving the gymnastic treat-

ment, causing a rational progression of the postures and movements to take place parallel with the change in the condition of the individual, is what constitutes a course in rational gymnastics or in gymnastic treatment in contradistinction to other courses of exercises.

I said that the amelioration of the body is the purpose. The amelioration may be understood as the amelioration of the healthy individual, so that he may actualize in his body the most of his possible physical beauty, strength and efficiency. Gymnastics for this purpose have been called "pedagogical gymnastics," and, through the pedagogical profession, they serve, in the first place, the schools and higher educational institutions. The gymnastic pedagogy, by its near relation to the subject of school hygiene, is related to the physician's interest. On the other hand, the amelioration of the body may be understood as the amelioration of the diseased body, that is, the postures and movements may be defined to serve the purpose of alleviation and cure of disease. Gymnastics for this purpose, as far as they actually adapt themselves for this purpose, serve medicine and demand a place in *materia medica*. They have been called "medical gymnastics," and by the inner order of the things they have the same relation to the business of the medical profession as the pedagogical gymnastics have to the business of the pedagogical profession.

The postures and movements needed for the purpose of pedagogical gymnastics have generally a different character, are more active than those generally needed for medical purposes, which sometimes are entirely passive. However, in the preparatory training under pedagogical gymnastics of weaker, yet healthy individuals, postures and movements are often needed, which resemble or are identically the same as those used in medical gymnastics. On the other hand, in the treatment of patients by medical gymnastics, particularly in the after-treatment, postures and movements of the same character as those used in pedagogical gymnastics are often employed. The boundary-line between pedagogical and medical gymnastics cannot be clearly drawn by stating that such or such movements and postures are pedagogical gymnastics and such others are medical gymnastics. The movements and postures are common, belonging to both branches. The distinction lies in the purpose to which they are adapted. They are pedagogical gymnastics when they serve education and are administered by persons qualified to serve education; they are medical gymnastics when they serve medicine and are administered by persons qualified to serve medicine.

The title of my paper, "Gymnastics in Heart Diseases," may perhaps at first impress with an accent of novelty. I feel confident, however, that if, by your courtesy, gentlemen, the definitions of the terms gymnastics and medical gymnastics, which I have suggested, are adopted by you during the discussion of my subject to-night, a few words only may suffice at the outset to divest the title of my paper of all trace of novelty. When, ages ago, a physician advised a sufferer from heart disease to go to bed and by the reclining posture the embarrassment of his insufficient heart-action abated, a gymnastic remedy was successfully employed. When you advise your heart patient to go to bed, or to sit up, or stand up, or begin to walk, to walk about more, to begin to walk downstairs and upstairs and so forth, you deal with gymnastic measures from the standpoint of my definition. In

<sup>1</sup> Read, by invitation, before the Boston Society for Medical Improvement, February 24, 1896.

<sup>2</sup> Translations of Swedish terms.

recent text-books on medical practice the discussion of the therapy of heart diseases contains in due place also the advice to take regulated exercises, a suggestion again of a gymnastic remedy.

This traditional and recognized essential part of the therapy of heart diseases contains, although in a comparatively vague and incomplete form, an outline and suggestion of the essentials of the gymnastic therapy of heart diseases. The reclining posture, the half-reclining, the sitting, the standing postures, a little walking, more of walking, walking up stairs, walking up hills and mountains, and other regulated exercises: these are somewhat defined postures and movements, and in the order I have mentioned them they represent an approximate progressive scale of exercises. They are, therefore, gymnastic from the standpoint of my definition of gymnastics. They are defined with reference to desired effects. When, for instance, the reclining posture is advised, it is not only because the patient is unable to stand or walk, but because the reclining posture brings the mechanism of his circulation to act under modified conditions, which make his insufficiency less felt and favor recuperation. The posture exercises a remedial influence. When again, sitting and standing and walking are advised, these exercises are not only marks of improvement gained under preceding conditions, but they help to adapt the mechanism of the circulation to their own more active conditions; they are therefore means of a remedial training. The same may be said of the other exercises mentioned.

However, the postures and movements mentioned are not so exactly defined gymnastic remedies as can be given. By rough comparison, they may be said to stand in a similar relation to the exactly defined gymnastic movements and postures, as the crude drugs, such as roots, barks, etc., stand to the active principal substances, alkaloids, glycosides, etc., which by chemical processes may be eliminated from them. The progression they represent is not an even, continuous, successive progression, but a progression by discontinuities, the members of the series distanced from each other by considerable intervals. Finally, they do not contain any suggestion of the idea of a gymnastic day's order or a prescription of a number of exercises, which combined give better result than one form of exercise alone.

If, however, we elaborate further the principles, spoken or unspoken, but surely involved in the employment of the postures and movements which I have enumerated and which are prescribed by all physicians in dealing with heart diseases, if we elaborate them so far in details as present knowledge and experience admits of, — we will reach practical conclusions that shall resemble the distinct method of gymnastic treatment which will be presented in the further development of my subject.

As the title of my paper implies, it is not my purpose to discuss the therapy of heart diseases *in toto*. What the therapy of heart diseases in general teaches, stands or falls with or without the gymnastic treatment of them. It is only one of the remedies at disposal which claims its own place among the rest. It is a fact, that in comparatively recent times, or since the first half of this century, perhaps from the early thirties, attempts have been made to understand and bring to practical applicability the effects of gymnastic movements and postures upon heart diseases. The

result has been, that at present three distinct methods are elaborated and described and practised. In chronological order mentioned, they are:

(1) The manual gymnastic method, originated by the Swedish gymnasiarch Ling, further elaborated by his followers, and during the last thirty or forty years by an increasing number of physicians in Sweden.

(2) The so-called medico-mechanic method, elaborated by Dr. Zander in Sweden.

(3) The mountain-climbing or terrain cure, elaborated by the German professor Dr. Oertel.

Of these methods the two first mentioned are most distinctly gymnastic, consisting of formally defined postures and movements. Oertel's is less formal in the movements employed, inasmuch as they consist in walking up hills, but in them certain physiological principles are employed, which are also employed in the two first mentioned, more distinctly gymnastic methods. Oertel's method is described in his "Therapie der Kreislaufs-Störungen," the description easily accessible. Zander's method is based upon the same principles as the manual gymnastic method, but elaborated differently in the technique inasmuch as mechanical machines, run by steam or electricity, give the postures and movements to the patient. The technique of this method cannot be well demonstrated without the machines; the theory is described, if the theory of the manual method is described.

The manual gymnastic method is the oldest, embraces the principles of all the methods, has the widest scope of applicability, and is continually being fuller elaborated by physicians in Sweden who hold official positions under the Swedish government as well as by private practitioners of medicine. The term "gymnastic physician" sounds as natural in the Swedish language as the title "orthopedic surgeon" in English. By this is meant men who have studied gymnastics in connection with medicine, have taken medical examination and are licensed by the Royal Medical Council in Stockholm as practitioners of medicine and surgery.

The manual gymnastic method can be demonstrated without elaborate accessories. I consider, therefore, I can best serve the opportunity of this occasion by a condensed description of this method and a demonstration of its technique.

Some of the principal workers and writers upon this subject may be mentioned. They are Dr. Sötherberg, former head-physician of the Orthopedic Institute in Stockholm; Dr. Jüderholm, former Professor of State-Medicine in the Royal Carolina Institute of Medicine and Surgery in Stockholm, also former head-physician of the Orthopedic Institute in Stockholm; Dr. Hartelius, former, and Dr. Murray, present Professor of Medical Gymnastics in the Royal Central Institute of Gymnastics in Stockholm; Dr. Rossander, former Professor of Surgery in the Royal Carolina Institute of Medicine and Surgery; Dr. Zander and Dr. Wide, both docents of Medical Gymnastics in the Royal Carolina Institute of Medicine and Surgery (Dr. Wide is also head-physician of the Orthopedic Institute in Stockholm, and Zander, head-physician of the Medico-mechanic Institute in Stockholm); Dr. Levin and Dr. Wallgren, Assistant Professors in Medical Gymnastics; Dr. Levertin, docent at the Royal Carolina Institute of Medicine and Surgery, etc.

I became first interested in the subject some ten years ago, when during the second year of my medical

course in the Medical School of the Royal University in Lund, Sweden, I received instruction in medical and pedagogical gymnastics. During last year I have returned to the study of the subject. In preparing my *résumé* for this occasion I have consulted the following writers :

Robert Murray, M.D. : The physiological basis of the gymnastic treatment of organic heart diseases (Swed.).  
 T. J. Hartelius, M.D. : Manual of medical gymnastics (Swed.).  
 A. Wide, M.D. : Gymnastics in the diseases of the organs of circulation (Swed.).  
 Astley Levin, M.D. : Contribution to the knowledge of the influence of medico-gymnastic movements upon the rhythm of the pulse in organic heart diseases (Swed.).  
 Frans Lindblom, M.D. : Gymnastics in heart diseases (Swed.).  
 M. J. Oertel, M.D. : Therapie der Kreislaufs-Störungen.  
 Herman Nebel, M.D. : Bewegungskuren mittelst Schwedischer Heilgymnastik und Massage.

When last spring I received the invitation from the President of the Boston Society for Medical Improvement to read a paper before the Society on some subject bearing upon gymnastic therapy, I decided to obtain further information upon the subject of gymnastics in heart diseases. At the summer clinic in Lysekil, in Sweden, I found Professor Murray and Dr. Wide, and through their courtesy I received their further information. Disclaiming originality on my part in connection with this subject, I feel confident that my *résumé* will be a correct, although necessarily condensed, representation of the method such as at present is understood and practised in Sweden.

The heart-diseases treated by gymnastics in Sweden are : valvular disease, fatty heart, weak heart (from nutritive disturbances), uncomplicated hypertrophy. Only in the uncomplicated juvenile hypertrophy, if that term is accepted clinically, cure can be obtained. In the other diseases, the result is alleviation of all the symptoms, making the patient more useful and comfortable, with prospective retardation of fatal development.

According to statistics just received from Stockholm, during the 27 years from 1865 to 1892, there were treated at the medical clinic of the Royal Central Institute of Gymnastics 1,209 cases, and at the Orthopedic Institute in Stockholm, 994 cases of heart diseases. Dr. Wide, the present head-physician at the Orthopedic Institute in Stockholm, states that he has about 100 cases of heart diseases a year under gymnastic treatment. The greatest number of these cases are mitral insufficiency with symptoms of failing compensation in various degrees. Inasmuch as the indications for treatment in the main are the same for the different heart diseases, mitral insufficiency may be chosen to exemplify the application of the gymnastic method.

The indications are :

- (1) To increase the force of the systolic stroke of the heart.
- (2) To relieve the venous hyperemia of the abdominal organs.
- (3) To relieve the venous hyperemia of the lungs.
- (4) To relieve the hydropic exudations.

The gymnastic treatment strives to meet these indications by (1) bringing in more effective operation the auxiliary forces of circulation, and by, on the other hand, (2) stimulating the heart to more forceful contraction.

The auxiliary forces of circulation are brought in more effective operation by

- (A) Manipulations, passive and active movements

which push the venous blood from the peripheric parts towards the *venæ cavæ*. Such are :

- (a) Massage of the extremities in centripetal direction.

- (b) Abdominal massage.

- (c) Certain passive movements (circumductions, flexion and extension).

- (d) Certain active movements, with resistance.

(B) Movements which increase the negative pressure within the thorax and thereby produce increased aspiration to the auricles. Such are the respiratory movements (deep inhalations).

The stimulating action upon the heart contraction is produced

(A) By the increased inflow of blood, caused by the movements mentioned, particularly as the inflow now consists of blood, better oxygenated, because of the respiratory movements.

(B) By manipulations upon the chest, which act as cardiac stimuli.

The larger inflow of blood gives a larger volume of blood for the ventricles to contract upon, gradually raising the arterial, diminishing the venous pressure. As the pressure difference between the aorta and the right auricle increases, the condition for the nutrition of the heart-muscle by the coronary circulation improves.

The increased pressure difference between the aorta and the right auricle promotes the relief of venous stasis and hydropic exudations.

Localized effect upon the venous congestion within the abdomen is added by the abdominal massage and certain passive and active movements involving that region, such as circumduction of trunk, alternate twisting of trunk.

Localized effect upon the chronic hyperemia of the lungs is added by the respiratory movements.

Localized effect upon the hydropic exudations is added by massage upon the region involved.

This is the physiology of the method, reduced to brief terms.

(To be continued.)

## Clinical Department.

### GENITO-URINARY CASES.<sup>1</sup>

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THE following cases seem to me to present some points of interest, and are therefore briefly reported :

#### SEMINAL VESICULITIS.

J. B. has had vesiculitis a long time, the result of gonorrhea. During the first three months of 1895 he was treated by stripping the vesicles, with marked improvement. Early in June he had a mild exacerbation of urethritis, but this had practically disappeared by the 27th. On that day, while urinating, the stream stopped for an instant, and he then expelled from the meatus a mass of membranous-looking substance. On inspection it was seen to have numerous branches, some very long and slender, some finger-like, some clubbed. Under the microscope it appeared structureless and transparent. It was examined by Dr. Coun-

<sup>1</sup> Read before the Boston Society for Medical Improvement, February 24, 1896.