**Medicina gymnastica, or, Therapeutic manipulation : a short treatise on this science as practiced at The Royal Institution, at Stockholm / by Charles Ehrenhoff.**

# MEDICINA GYMNASTICA,

OR

# THERAPEUTIC MANIPULATION;

## A Short Treatise on this Science,

AS PRACTISED AT

# THE ROYAL INSTITUTION,

AT

## STOCKHOLM.



BY

CHARLES EHRENHOFF,

MEMBER OF THE ROYAL INSTITUTION AT STOCKHOLM.

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Plus apud nos vera ratio
Valeat quâm vulgi opinio.

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# PREFACE.

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It is perhaps not out of place to mention, that the mechanical agent which is treated of in this pamphlet is in no way opposed to the old system of Medicine, or, as it is called, the Allopathic method; on the contrary, it often serves as a great assistance to the pure medicinal treatment. But it is chiefly where the other method cannot be successfully employed, as in a chronic stage of disease, that this therapeutic agent is most valuable and certain.

Trusting that this little Treatise will be kindly received by the leading physicians, and by the public in general, I have formed, in conjunction with my friend Mr. in de Bétou, an Establishment for the practice of Therapeutic Manipulation, upon the same

principle (though upon a much smaller scale) as the Royal Central Institution at Stockholm. The advantages of such an Establishment, before a visiting practice, are many; for, in the first instance, time is gained by the patients coming to the medical man; and, secondly, the applications can be performed with more accuracy, as an appropriate furniture is always to be found in such a place. However, it is needless to mention that when weakness does not allow the patient to attend daily at the Establishment, then he must be visited.

C. E.

3, *Upper Gower Street,*
*Bedford Square.*

# MEDICINA GYMNASTICA.

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Man is gifted with various faculties, through whose proper development he is able to lay a foundation for his own happiness, as well as for that of his fellow-creatures. There is, however, one great difficulty which frequently is opposed to such a development. This is easily observed by any one who, with attentive look, has followed the march of intellectual and physical life, in which the budding of a high intelligence has often been blasted, from physical causes, even in its earliest growth. Is it necessary to remark, that thousands of parents are constantly and sadly disappointed in the moral and intellectual progress of their offspring? Still more, need we state the cause of this disappointment? The chief cause is an erroneous method of education. But this erroneous education relates not so much to defects in the moral and intellectual department of educational training, as to the physical, which seems almost to be neglected, nay, even forgotten. And yet, is not the latter the necessary condition upon which the perfecting of the two former ought to rest? Is not the body, which consists of a brain, nerves, muscles, bones, &c., the medium, or the instrument by which we receive our impressions from, and by which we act upon, the external world? If, therefore, this delicate instrument is not in perfect order,

it is clear that the intellectual power must in proportion be weakened, or even rendered imbecile. The harmony of all the parts constitutes the perfection of the body, and as Nature has established certain laws according to which this perfection is attainable, there remains for us nothing else than to follow the dictates of nature, or to suffer her penalties for their infraction.

That science which teaches us these laws of nature, and by which all the parts of our frame can receive a harmonious development, has, by the ancients, been called Gymnastics.* Suppose that a youth is placed in the hands of a medical man who is thoroughly acquainted with Gymnastics, or with the effects of bodily motions rightly performed by and applied to the human frame. Suppose, further, that this youth has a narrow and contracted chest, a large head and abdomen, together with slender and distorted extremities. Will not this medical man, by applying the means which he possesses in this science, restore the equilibrium of the parts, cause the arterial streams to be properly distributed, give stimulus to the absorbents that they may remove waste matter, and so produce a harmonious development of a frame, which, if left alone, would either have lingered on in a miserable existence, or have died at a premature age? This we have stated as an example of the usefulness of the gymnastic science properly applied. This must be equally useful at all ages; as every one, young or old, is in need of bodily exercise for the preservation of the frame.

The utility of gymnastic science to society at large is easily comprehended when we have proved its usefulness to each individual. The ancient nations owed all their greatness to bodily exercises, which enjoyed with them the greatest regard, and which was highly encouraged by public festivities and great prizes. Their lawgivers exhorted their fellow-

* This term, now-a-days, has been very much abused, and by many is understood only as a set of games, horsemanship, and public show of bodily strength and agility: but we speak here of Gymnastics as a science.

citizens to exercises of a proper nature. The result was also, that they possessed great men in abundance. It is true, when the Spartans gave too exclusive a preference to their bodily exercises, they attained a high standing as warriors merely, and were far behind the other nations in the sciences; but this only proves the danger of the abuse of anything good and useful. With the Romans, Gymnastics were practised with the greatest zeal during the most flourishing time of the republic, and even after its downfall, at the beginning of the empire, it was held in the greatest estimation, as Horace tells us, who practised it himself. At a later period, tricks of jugglers and theatrical performances became fashionable and prevailed, and the true Roman spirit began more and more to grow faint, until manliness disappeared, and the proud *Roma* was obliged to succumb to the sword of the more hardy and powerful Goth.

The knightly spirit of the Middle Ages, which was the result of bodily exercises, as tournaments, &c., would have produced something great and astounding to the world, had it only been supported by intellectual cultivation. On the contrary, the great delusions and mistakes of the eighteenth century would not have caused so much moral depravity, had more attention been paid to physical education.

It is clear that a sedentary life must weaken the circulation of the blood, for the heart alone is not able to keep it up. "I do not know," says Ackerman, "which is most necessary for man, *food* or *exercise*." Exercise increases the circulation of the blood, produces animal heat, attenuates and divides the fluids, and promotes a regular perspiration as well as a due performance of all the secretions : further, it accelerates the animal spirits, sends the nervous energies to all parts of the body, creates appetite, and helps digestion. Whence it arises, that those who accustom themselves to exercise are generally very robust, and seldom subject to attacks of disease. It should never be forgotten by those of studious habits, that the delicate springs of our frail machines lose their elasticity, and the vessels become clogged with obstructions, when we

totally desist from exercise; from which consequences arise, necessarily affecting the brain. A mere studious life is therefore equally prejudicial to the body and the mind. Ackerman considers a sedentary life as the source of all cachectic diseases, and Dr. Tissot regards bodily exercise as their best remedy.

Medical men of all times have acknowledged the necessity of exercise for persons of all ages, not only for the good of the body, but also for the benefit of the mind. The great Hoffman says that he has improved the intellectual faculties of persons of weak understanding by allowing them the use of proper exercise. It is, therefore, strange that in these modern times people seem to have forgotten the golden rule, so strongly and constantly urged by ancient and modern physicians, "often to rest and recruit the mind by proper bodily exercise."

Now then, these questions arise:—What sort of exercise is the most proper? What sort of exercise causes the least loss of time? What can with greatest facility give back tone to the nervous system, promote the circulation of the blood, and put the digestive organs and all other parts of the body into their normal state of activity? Riding on horseback, fencing, walking, &c., are all very good exercises in their way, but as a few sets of muscles only are acted upon in each of these, it is clear that none of them can give that manifold variety of motions to the different sets of muscles which is necessary to their highest health. Gymnastics is the science which teaches us how to give in a short time to every muscle in every part of the body, that exercise which is just enough to promote the harmony of the whole system. It is useful for all ages and for all constitutions, and can be made to act in the highest degree energetically, or in the lowest degree mildly, according to circumstances; and proves itself therefore as useful for the strong as for the weak.

The first person who applied the gymnastic science as a therapeutic agent was Herodicus, who, according to Plato's statement, was the teacher of Hippocrates. He observed

that some parts of the bodies of the Athletæ became more developed than others, and according to this observation he arranged the muscular motions, and the science of applying Gymnastics in cases of disease received the name of *Medicina Gymnastica.*

The gymnastic science of modern times is not more than some sixty years old, and Dr. Tissot may be considered as its regenerator. He is the only one, amongst modern authors, who has treated the subject in a scientific manner. After Tissot, the gymnastic science became purely empirical, as those who afterwards wrote upon this subject hardly spoke of anything more than its use in general, without referring it to those anatomical and physiological laws upon which scientific Gymnastics ought to be founded.

The honour of having rightly understood the gymnastic science, and of having brought it into a system, belongs to the late and immortal Ling,* of Sweden; and he may justly be considered as the founder of the new system of Medicina Gymnastica. Not less merit is due to the successor of this great man, Professor Branting, who is the present chief physician of the Royal Institution at Stockholm, where the gymnastic science has been developed in high perfection.

The gymnastic institutions which at present exist in Germany and France are chiefly for the exercise of young people, and where the hygeinic branch only of the gymnastic science is practised. But nowhere, excepting in Sweden, has this science been used as a therapeutic agent. It is true, some of the Orthopœdic institutions on the Continent have attempted to make use of Gymnastics as a curative means; but as this has only been done in a single class of diseases, and without proper knowledge of its true application, we can say with certainty, that they are not even aware of the power which this mechanical treatment possesses.

The question may be asked by many, How is it possible

* Ling died in 1838, at Stockholm; was Professor of Physiology, one of the eighteen of the Swedish Academy of Sciences, and Knight of the Polar Star.

that an external mechanical treatment can affect the more internal parts of our body? The answer rests with the idea of the last-mentioned word, for our organism can only be considered as one *whole;* a unity in perfect harmony with itself; and as a chemical effect can proceed from the internal parts to the external ones of our body in consequence of this unity, so can also a mechanical effect go from the external to the internal. Thus, the Gymnastics is not merely a mechanical power, but it has the greatest influence both over the vegetative and the intellectual life of our frame.

The effect of active muscular motion is a rush of blood towards those muscles which operate (we can almost say that they imbibe blood); the circulation in the whole system is accelerated, and animal heat is generated. The after-effect is an effusion of plastic lymph, whereby new muscular fibrils are formed. This is also the reason why the muscles increase in bulk and strength by motion. But a high degree of activity of one part causes a proportionate loss of tone in other neighbouring organs; consequently, the strength of any part can be increased at pleasure at the same time that the strength of any other part can be diminished in the same way. We have a clear example of this in the highly developed state of the muscles of the blacksmith's arms, and in his slender legs; or in the strength of this part of an opera-dancer, and his want of development and power in the upper extremities.

It is well known what an effect muscular motion has upon all the systems of the human body. Thus, the formation and structure of the bones, and particularly their shape, articulations, and direction, depend in a great measure upon the state of the muscular system. Muscular motion is therefore the chief means, if not the only one, in an orthopœdic treatment. A curvature of the spine can also easily be cured by properly directed muscular motion; nay, even distorted bones in young children can be brought into their normal state by the judicious application of Therapeutic Manipulation.

As we have mentioned above, muscular motion acts both

quickly and powerfully on the *circulation of the blood*, and this motion can be so directed at pleasure, that it either acts upon the central or peripheral blood-vessels. For instance, a leap, or running up an inclined plane, causes in a moment an increased activity in the circulation, which accelerates the beats of the pulse so much that it can be compared to nothing else but a transient inflammatory fever; a rubbing or friction again, applied to any part of the surface of the body, causes an increased activity in the cutaneous vessels of the same part, and produces at first a feeling as if tepid water was poured over the part. The effects of these two motions are widely different, and they can almost be said to be opposed to each other. In the first case the motion is purely *arterial*, but in the latter, *venous*, or, as it also is called, *absorbing;* because, in the one case it acts upon the arterial system, and in the other, upon the venous. An operator of Medical Gymnastics can, therefore, affect which part or organ he chooses, in what degree of strength, and for how long time he considers it necessary, to call forth a change in the activity of the vessels. But an increased activity in one part is brought on by the blood rushing towards this part, at the same time partly leaving other neighbouring parts; consequently, a clogged state of the vessels, or, in other words, congestion can in this way be cured by the application of Medicina Gymnastica. Hemorrhoids (piles) may be cured in this manner by diverting the morbid activity of the viscera, and by relieving the congestive state of their vessels. On the same principle, can a congestion of the lungs, a catarrh, &c., be entirely cured by united arterial and absorbing motions. It will not be difficult now to comprehend, *per analogiam*, how the lymphatic system is influenced and acted upon by this agent.

The nervous system is in the nearest relation to, and highly dependent upon, the muscular system. The tone of the nerves is increased and heightened by muscular motion; but if this be omitted they soon become weakened. For this reason it is that nervous diseases and nervous irritability belong almost exclusively to those persons who live a seden-

tary life, but are seldom found among the working classes of the community. The nerves can not only be strengthened, tempered, and calmed through the influence of muscular motion, but these effects can also be brought about by direct or indirect pressure upon the nerves. It is therefore possible to cure nervous weakness and irritability produced by debauchery and other weakening causes, by the gymnastic agent. Spasms and cramps, so common among ladies, can never be cured in a more certain and safe way than by this treatment.

May we not have conveyed the idea that this mechanical treatment confines itself merely to the use of the voluntary muscles? It is true, the *active* motions or exercises of those muscles which are dependent upon the will, is certainly a powerful and general mode of operation in Medical Gymnastics, but it is not the only one. By a variety of manipulations the operator is able to act upon those parts of the muscular system which do not obey the will; as upon the heart, upon the intestines, and almost upon any part of the body. That sort of motion which is applied by the hand of a second person upon another is called *passive*, in order to distinguish it from *active*, which is a muscular motion performed by the patient himself. To walk, run, or lift anything, are active motions, and these are preferable in a healthy state of the body; but frictions, vibrations, percussions, rotations, &c., applied by one person upon another, are passive motions, which are more applicable in a diseased state. However, these two modes of operation are often conjointly made use of. The efficacy of the *active* motions might often be too great if it were not modified by the reaction of the *passive*. These, on the other hand, would often be too feeble in their influence if unsupported by the arousing of the voluntary power. Exercise taken by a healthy person every day for years together has not been able to prevent disease. Here the *passive* application is in its place. It is clear from the above how highly necessary it is to perform a proper diagnosis before the treatment can be determined upon; and as

in pure medicinal treatment, the idiosyncrasy of the patient is taken into the strictest consideration, so will it even with the use of the mechanical agent, be necessary in order to vary the applications to suit individual cases, even where the disease may be the same.

We will describe a few of the applications and motions, in order to convey an idea of their effect.

1. *Raising the body by the arms* affects those muscles which belong to the respiratory apparatus, and effects an equalisation of the circulation of the blood in the lungs, which again causes an increased formation of primary cells, and leads to an improved growth and development, as well in the muscles of the shoulders and breast as in those of the arms.

2. *Bending the knees,* in an erect position of the body, increases the arterial supply of the muscles of the lower extremities, and is chiefly used as a *diverting* motion. If it be used in conjunction with a motion directed towards the trunk, its effect is divided amongst the above-mentioned parts, the viscera, and the muscles of the trunk.

3. *Lateral twisting* of the trunk acts differently according to the way in which it is done. This motion acts partly upon the superficial vessels and nerves of the abdominal muscles, and partly upon the deep-lying larger blood-vessels, according to the resistance which the patient makes. The abdominal organs are acted upon with different power according to the different changes of angle into which the trunk is put.

4. *Raising the trunk* from a bent into an erect position.—This is chiefly an arterial motion for the muscles of the neck and back, but is also venous. Through changes of angles which the trunk forms with the lower extremities, the diameter of the abdomen is decreased, and as the inspirations are almost continuous, and only varied by few expirations during this kind of motion, the quantity of venous blood in the abdomen is diminished, whereby absorption is increased in the abdominal organs. If it be desirable still more to increase such absorption, a gentle pressure must be made upon the abdomen; and if this be accompanied with

resistance on the patient's back as he is raising himself gently up, a decrease of secretion takes place within the intestines, whereby this motion becomes highly useful in cases of diarrhœa.

5. *Ligature* is an application of the greatest use in the mechanical treatment. It is applied round the base of the skull, round the chest and abdomen, round the arms and legs, and wherever it is desirable to retard the venous stream. The effect of this, particularly when the ligature is applied to the extremities, is not only directed towards the soft parts, but also to the membranes of the bones and the bony substance themselves. Thus it is, that it is so efficacious in varicocele, in tubercles of the bones, &c. The tourniquet is therefore a most powerful instrument in the mechanical treatment.*

6. *Friction.*—This operation can call forth quite different effects, according to its application to different systems or organs of the body, or according to the different degree of strength, or the different kinds of means by which it is applied. Performed gently on any part of the surface of the body, it hardly does more than cause a venous absorption in the cutaneous part; but applied with a little pressure, it acts upon deeper seated parts, distributes both blood and lymph, and enlivens the activity of the nerves. Applied again to the neighbourhood of a diseased organ, it will allay pain, and divert congestion, and directed towards the region of the abdomen, it serves to promote the activity of the venous and lymphatic systems, and to assist the function of the liver and the intestines, &c. Applied along the course and ramifications of nerves, it stimulates their activity, and can by this means be made to act upon the nervous centres, namely, the brain and spinal marrow. A friction along the longitudinal sinus on the top of the head produces a general venous absorption within the integuments of the cranium, which causes a peculiar cold sensation along the spine. Relaxation of the

* No. III. of the present series of the Lancet has an article, in which a case of popliteal aneurism is stated to have been treated and cured by pressure, by Dr. Allan.

uvula, which is caused by increased irritation of the vessels, is cured by applying friction to the palate, and is best performed by an instrument.

7. *Percussion*, if it be performed with the flat of the hand or an instrument, produces a quick and powerful venous absorption ; but it is much stronger if it be done in a hacking way, by the edges of the hands for instance. By flat and sharp percussions performed in the region of the chest, the respiration is made easier ; and this is done partly by the direct action upon the respiratory muscles, and partly by the passive motion communicated to the lungs. This application performed upon the extremities produces a venous absorption not only within the cutaneous tissues and fascial structures, but also within the muscles, and even upon the periosteum. Thus, they are to be regarded as the most efficacious means of Therapeutic Manipulation, in order to increase venous absorption.

8. *Vibration*.—This acts according to the strength with which it is applied, and directly on that point on which it is desirable to produce an effect. For instance, if it be performed by the finger ends of both the hands in the epigastrium, it will prove itself, in conjunction with other applications, highly beneficial in hysterical or hypochondriacal disorders. If it be applied close to any of the articulations, it affects the ligaments of the joints ; and in general, if it be applied to a smaller or larger surface, it increases the venous absorption.

9. *Compression (pressure)*.—This operation is also directed to a certain point, and chiefly in order to compress a blood-vessel, or to affect a nerve. By these compressions prompt and great effects are produced and lively reactions are called forth. Agues, toothache, rheumatic affections, nay, even scirrhous tumours, have been totally cured by compression.* Applied to the jugular veins it has a strong effect upon the

* This part of the mechancial treatment is used in some of the London Hospitals. We have seen enlarged and inflamed glands treated in the Dreadnought Hospital Ship by pressure ; and one of the medical men at this establishment related that other inflammatory cases had been treated in the same manner by pressure or dilatation.

sinuses of the cranium, whereby the brain is put into an artificial state of congestion, which at last causes a continued absorption.

10. *Rotation* is a rotatory motion performed with a part of the body, as, for instance, the hand or the foot. If it be properly applied, it tends to lubricate the joint by stimulating the synovial membrane, causing a passive play of the ligaments, increasing the animal heat, and after dislocations is a most excellent means for restoring the normal state of the ligaments. If a rotation be performed with the head, it creates a sensation of giddiness, by the venous blood being partly retained in the sinuses, which also has for effect an increased absorption. Again, if the rotation be performed by the thorax, when the pelvis and the lumbar region must be fixed, it affects the venous capillary vessels of the heart and lungs.

We have now shown a few of the motions and applications which are used in this treatment. The diversity and multitude of the motions are indefinite, and they can also be combined in various ways. Upon the proper combination of motions depends also the judicious treatment of disease, and as useful as this treatment is in the hands of the skilful medical man, so dangerous is it when applied by the ignorant and inexperienced.

Suppose we receive a patient who suffers from a disease of the heart, for instance, *hypertrophia cordis;* any treatment whatsoever in this case must have for its object the formation of new groups of vessels within the peripheral system of the circulation, if it shall be able to diminish the circulation within the heart, and not only allay, but even cure an organic disease of this organ. To effect this, mechanical applications are given to those parts which are situated farthest from the heart, or such motions are applied as have for their object to develop the network of the vessels in the muscles of the lower extremities. Besides this purely active treatment, direct pressure on nerves ought to be introduced, partly on the lumbar nerves, partly on the nerves

of the thigh and popliteal region, but only in case the peripheral circulation and the muscular department should be much weakened. As soon as the activity of the vessels of the lower extremities has increased, and the animal-heat has returned, and the muscular system of this part has been more developed, &c., the arterial supply within the pelvis will become augmented. Again, when the violence of the movements of the heart is diminished, the breathing becomes easier, the coldness of the extremities ceases, appetite and rest at night has returned; first then may motions be applied for absorption within the heart and lungs, being yet cautious to avoid every motion which produces a formation of vessels within the muscles of the chest, merely using vibratory motions and percussions. Only at the end of the treatment will it be permitted to use active applications for the upper extremities and the respiratory apparatus. This is, in short, the march of the treatment in this case. Should, now, this order in the least be reverted, either from ignorance or want of experience, the results are sure to be fatal.

By a thorough acquaintance with anatomy, physiology and pathology, and a perfect knowledge of these manipulations, it is clear that Medical Gymnastics is a most powerful therapeutic agent, particularly in diseases of a chronic nature. The Swedish Government has acknowledged this truth, for already several years ago an Institution of this kind was formed at Stockholm, under royal protection, and has received a yearly grant from the Swedish Parliament. Here thousands of people have regained their health and renewed their constitution ; and it was by the use of this treatment that the present King of Sweden was restored to health two years ago, after having suffered severely from an obstinate rheumatic affection. It is at this Institution, and with these mechanical means, that Sir Thomas Cartwright, the present English Ambassador at Stockholm, is daily improving, after having been a sufferer from continued constipation, and hypochondriacal affections.

We have now given a few hints with regard to a science,

which ought to stand high in the estimation of the public for its great usefulness ; and we have stated in a few words the existence of a therapeutic agent of a mechanical order, which in efficacy does not give way to any of the *materia medica*. No one can with reason say that exercise has no effect upon our body. If, then, the most illiterate person will not deny exercise its high value and influence on the economy of our frame, because that influence is so self-evident, how much less can we anticipate opposition or objection to exercise brought into a scientific system ; and, according to its rules, applied to the human frame. The philosophy of the thing is as plain as it can be. *Nunquam aliud natura, aliud sapientia dicit.*

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