Kinetic jottings : miscellaneous extracts from medical literature, ancient and modern, illustrating the effects of mechanical agencies in the treatment of disease with remarks / by Augustus Gerogii.

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KINETIC JOTTINGS:

MISCELLANEOUS EXTRACTS

FROM

MEDICAL LITERATURE, ANCIENT AND MODERN,

ILLUSTRATING THE EFFECTS OF

Mechanical Agencies in the Treatment of Disease.

WITH REMARKS

BY

PROFESSOR AUGUSTUS GEORGII,

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"Does a man speak foolishly? suffer him gladly, for you are wise. Does he speak erroneously? stop such a man's mouth with sound words, that cannot be gainsaid. Does he speak truly? rejoice in the truth?"

OLIVER CROMWELL.

PREFATORY REMARKS.

A FEW remarks on the growth of the system of Swedish Gymnastics, at least as far as my own connection with it is concerned, may not inappropriately serve to introduce this small volume to the notice of the English public. The following brief *résumé* of facts will, I hope, therefore not be considered as out of place.

The Royal Gymnastic Institution of Sweden was founded in 1813, and endowed by a public grant of money; and from this time dates the official recognition of the Swedish method. The next step was taken in 1820, when the introduction of Gymnastics into the public schools was legalised by the State. The Institution itself was under the uninterrupted direction of the founder, P. H. LING, until his decease in 1839. In accordance with his dying request, the joint editorship of his posthumous work, "The General Principles of Gymnastics," which had been commenced in 1834, in consequence of a mandate of the Swedish Diet and of a sum of money having been awarded for the purpose, was confided to Dr. LIEDBECK and myself; and the work thus entrusted to our care was completed—as fully as the fragmentary character of the manuscript would allow—in 1840. From that year may be observed the influence of the Swedish Gymnastics on the German method ("turnen"); and this influence was yet more marked after 1845, in consequence of the reports given of the system by Dr. ECKHARD, Major HG. ROTHSTEIN of the Prussian Army, Professor RICHTER, M.D. It would be out of place to enumerate here the authors who have since written or commented upon it; although some of these have certainly rather obscured than

elucidated the subject on which they have professed to write.

In 1839, the year of LING's decease, Professor BRANTING succeeded to the headship of the Institution; and I was promoted to the post of Sub-Director, which BRANTING had previously held. The skilful and successful method of application, as well as the intelligent mode of exposition employed by Professor BRANTING in reference to the system of Medical Gymnastics—of which, indeed, he is the first scientific expounder—have called forth a verdict of approval from several foreign physicians, among whom may be mentioned Dr. EULENBURG, Dr. MELICHER, and last, but not least, the enthusiastic admirer of the system, Dr. NEUMAN. Dr. NEUMAN has himself given an *exposé* of the whole system in a couple of volumes; whilst Dr. EULENBURG has presented, in short monographic writings, a clear idea of the importance of a correct "technique"—only attainable, in point of fact, by practice.

Having for ten years, as far as my duties as Sub-Director would permit me, attended the lectures and courses of the Medical School at the Royal Carolinian Institution of Stockholm, I obtained leave of absence in 1846, for the purpose of visiting the different medical schools of the continent; and during a lengthened stay in Paris, from 1846—48, for physiological and clinical studies, I published an *aperçu* of LING'S System,* "which," in the words of a reviewer, "was the first book, written in a foreign language by a Swede, on the Swedish Gymnastics." At this time, 1849, I gave up my charge at the Central Institution, for the purpose of attempting to diffuse a true and full knowledge of the system in England, by a practical development of its fundamental principles. This is not the place to inquire how far my

* La Kinésithérapie, ou Traitement des Maladies par le mouvement, selon la méthode de Ling. Suivi d'un abrégé des applications de la théorie de Ling à l'éducation physique. Paris, 1847. Pp. 147.

thirty years' practice abroad may have exercised any influence on works that have been written on the subject of Gymnastics—I mean any influence in the spirit of LING or BRANTING. Besides my own publications, the remarkable pamphlet on the subject by the great classical scholar, Dr. CHAPMAN, and the publications of Dr. ROTH (the first of which he has dedicated to Professor BRANTING and myself), have doubtless aided considerably in extending a knowledge of the subject; nor must the publications and labours of my predecessors, Mr. IN DE BETOU and Mr. EHRENHOFF, be lost sight of in this connection. In Germany also, Dr. RICHTER and Dr. NEUMAN have expressed favourable opinions on my first publication; and their verdict may well serve to counterbalance the severe criticisms that have appeared in some other quarters. I regret, however, to be compelled to say that my endeavours to induce the English Government to organise an institution for the training of teachers in the theory and practice of Gymnastics, similar in form and spirit to those which have been copied or borrowed from the Swedish model by other countries, notably Prussia, have entirely failed; although it is right to add, that the hope of finally realising this object, or at least of seeing the matter taken up by the English public, led me, on the occasion of the retirement of Professor BRANTING in 1862, to decline the offer of the Swedish Government that I should become his successor. Finally, however, I was prevailed upon by family considerations, and on account of my advanced age, to return to Sweden in 1877, to end my days in my native land.

I have at the present time several manuscripts on the Swedish System, which pecuniary considerations prevent my publishing, among which may be mentioned :—

1st. A translation of LING'S "General Principles of Gymnastics," to which the collection of facts and statements contained in the following pages was originally intended to be an appendix. 2nd. A manuscript which has for years

been ready for the press—a revised translation of the System of Free Exercises for the Swedish Army in 1836. In this work I had intended to reintroduce several types of movements, which have been excluded by the military authorities who superintended the revision of LING'S original manuscript. I considered it due to myself to reinsert these, as the elaboration of certain parts of this work had been confidentially entrusted to my charge. 3rd. A manuscript, containing a Review of LING'S System, together with statistical tables, showing the results of twenty years of my own practice in England.

Following, however, the advice of some Swedish friends, I have determined in the first instance, as more in harmony with my own resources, to publish these fragmentary annotations. As a small nucleus, some of them appeared in a pamphlet, published shortly after my arrival in England, 1849, entitled "A Few Words on Kinesipathy, &c., according to the method of Ling." They are the fruits of many years reading, and contain facts and observations, many of which have been made by medical men of the highest eminence, as to the curative results obtained by the use of mechanical agencies. In the process of gathering together these facts and observations, opportunity has been afforded me of referring to different important points in connection with the theory and practice of Gymnastics, of which opportunity I have been glad to avail myself. I venture to express the hope that these annotations, thus brought together, will contribute to awaken an interest in Kinesiatrics as a method of healing; and I trust they will be received with the same kind forbearance which I have so often experienced during the many years I resided in England.

AUGUSTUS GEORGII.

STOCKHOLM,
3rd May, 1880.

ERRATA.

The Writer regrets that from the necessity of transmitting the proof sheets for correction from London to Stockholm, unavoidable delay has been occasioned in the publication of this work; and that from the same cause also many errors have escaped notice which might otherwise have been detected. This has especially been the case in the spelling of the names of the Medical Authorities to whom reference has been made. The Writer trusts that for these errors, and for all other defects that may be found in this small volume, he may hope for the indulgence of the candid reader.

For Neuman *read* Neumann.
,, Bastian ,, Bastien.
,, Sylvester ,, Silvester.
,, Riccord ,, Ricord.
,, Marchettes ,, Marchettis.
,, Arbey ,, Abbey.
,, A. Bernard ,, A. Berard.
,, A. Santeson ,, A. Santesson.
,, Benoiston de Chatauneuf *read* Benoiston de Chateauneuf.
,, Zanders *read* Zander.
,, Tillt ,, Tilt.
,, Ceulinaer ,, Ceuleneer van Bouwel.
,, Vteminex ,, Vleminex.
,, Mercuriales ,, Mercurialis.

PAGE

89. *For* Elehtricität *read* Elektricität.
,, Hemmungsncrvensystem *read* Hemmungsnervensystem.
108. ,, asitting *read* a sitting.
115, Also the Appendix on , and p. 201, on a practice of Dr. Silvester in treating Consumption.
129, No. 167, line 4, *for* reduced to 40 degrees *read* reduced to 40.
136. Note. *For* "barresplanches" *read* "barres-planches."
137. A. 8. *For* Subaxillary *read* Submaxillary.
Obs.—The signs for vibration (=) should have been half the length marked.
157. *For* Kinesitherapie *read* Kinésithérapie.
161. Note. *For* periodically *read* periodical.
164. Note. ,, The Principle of Physiology *read* The Principles of Physiology.
166. *For* see Appendix *read* see p. 234 and note.
211. Note. *For* "Andentungen über die seitwärts biegung des Rückrather" *read* "Andeutungen über die seitwärts biegungen des Rückgrates."
212, 9th line. *For* Scolioses *read* Scoliosis.
228, 13th line from bottom. *For* Education *read* Educational.

FRUITS OF READING:

A COLLECTION OF FACTS IN PROOF OF THE USE AND THE CURATIVE EFFECTS OF MECHANICAL AGENCY IN THERAPEUTICS.

In reviewing ancient and modern literature, there will be found in facts related, or in the opinions prevailing during different periods respecting mechanical agency, a corroboration of the writer's opinion as to the importance of its reintroduction into modern therapeutics, in accordance with a systematic plan, based upon anatomical, physiological and pathological laws.

In the first place, we meet with the fact that in ancient Greece and Rome active and passive movements, therapeutically applied, occupied a considerable position in the healing art, and formed a part of a great system of national education;* and that in many parts of the country establishments existed, under the direction and superintendence of persons specially trained for the purpose, who, besides a general surveillance over the health of their pupils, "appear to have undertaken the treatment both of accidents, which occasionally occurred in their establishments, and also, when necessary, of *internal diseases*. These 'Gymnasiarchs,' as they were called, must have acquired a certain degree of information respecting the nature of disease, and seem to have been considered as among the most skilful practitioners of the age in which they lived." †

* MERCURIALIS, "De Arte Gymnastica," and several learned authors after him.

† BOSTOCK, "Sketch of the History of Medicine," p. 24.

1. Without inquiring whether HERODICUS was the founder of the Medico-gymnastic treatment in Greece,* it is to be remarked that HIPPOCRATES ascribed to himself the honour of having perfected the method. He seems to doubt "whether diet has the advantage of exercise, or exercise of diet, or whether they mutually agree;" and his assertion that exercise gives strength and firmness to the body and vigour to the mind, makes it plain that he did not undervalue the general salutary effects of regulated Gymnastic exercises. If in his attempts to explain the various effects of friction, viz., that frictions, if violent, harden the body; if gentle, soften it; if plentiful, attenuate; if moderate, increase the bulk,† we at first find the Father of Medicine somewhat hypothetical; yet his observations certainly express a great general truth, and also prove the high position such operations must have held in the therapeutics of the ancients: a view which is confirmed by the fact that among the Greeks there was a class of physicians called "Iatrolepta," whose principal if not only practice consisted in the treatment of diseases by frictions and inunctions, &c.‡

2. CELSUS§ supplies a great number of proofs of the use of active and passive movements in the treatment of diseases, previous to the preponderance of the chemical school. Speaking of ASCLEPIADES, according to whom, "it is the duty of a physician to effect the cure safely, speedily, and with ease to the patient (*cito, tuto et jucunde*)," CELSUS mentions how this author, in his book of *general remedies*, advocates only three, viz., *friction*, *gestation* (riding on horseback or in a carriage, &c.), and *wine;* dwelling more par-

* LE CLERC, "Hist. de la Médicine."

† HIPPOCRATES, "De Dieta," III., Sat. 12.

‡ "Dictionnaire Médicale." Paris.

§ CORNELIUS CELSUS, "Of Medicine." Translated by JAMES GRIEVE. London, 1838.

ticularly upon friction, as having himself invented it. It is to be regretted that his work is no longer extant; as "it cannot be doubted," says CELSUS, "that ASCLEPIADES has been both full and clear in his directions when and how frictions ought to be used."

Active movements were generally confined to walking (either in a straight line or circle), running, swimming, riding on horseback, playing at ball, reading aloud, &c. Now and then we find instances of localisation of the exercises to the upper or lower extremities, as "exercises that employ the hands;" others, in which modifications of the respiration were observed ("take exercise, keeping the breath"); and in some cases the temperature was a matter of consideration ("exercises in the shade or in the heat of the sun," &c.).

Among passive movements, *frictions and inunctions* held the first place; then rubbing and "taking hold of the skin in many parts, to draw it out:" gestation (riding, &c.), brushing, ligatures, dry cupping, were also used.*

The following extract shows how friction was employed in some of its modifications:—

"Frictions may be used in the decline of an illness, yet they are never to be practised in the increase of a fever. They are also to be performed sometimes over the whole body, as when we would have an infirm person to gain flesh; sometimes in particular parts, either because the weakness of that part itself, or of some other, requires it. For both inveterate pains of the head are mitigated by the friction of it (yet not during their violence), and any paralytic limb is strengthened by rubbing it; but much more commonly, when one part is in pain, a different part is rubbed; and particularly when we want to make a derivation from the upper or middle part of the body; and with this intention we rub the extremities. And those persons are not to be regarded who indicate the exact number of times a person

* CELSUS, B. II., Ch. xiv.

ought to be rubbed, for that is to be estimated by his strength. Thus, if one is weak, fifty times may be sufficient; if of a more robust habit, it may be done two hundred times, and then in different proportions betwixt these two, according to the strength. Whence it is also requisite that the motion of the hands in friction be less frequent in a woman than in a man; less frequent in a boy or an old man than a young man; lastly, if particular parts are rubbed, they require much and strong friction, for the whole body cannot be quickly weakened by a part, and there is a necessity for dissipating as much of the matter as we can, whether the intention be to relieve the part we brush, or another part by means of it. But when weakness of the body requires this treatment all over, it ought to be shorter and more mild, so as only to soften the surface of the skin, to render it more apt to receive new matter from new nourishment."

A few instances will suffice to show how the ancients, according to CELSUS, applied these *resources:* "In cases of *spitting of blood*, he asserts that ERISISTRATUS made many ligatures on the legs and thighs and arms of such patients. ASCLEPIADES was so far from thinking this useful, that he even judged it hurtful; but a number of experiments prove that it answers very well. Nevertheless, there is no necessity for making ligatures in many places, but it is sufficient to do it below the groin, and above the ankles, and near the top of the shoulders, and the forearm; besides, rest and silence are necessary. The patient's head, when he lies, should also be high. Frictions are prejudicial, unless when the bleedings have entirely ceased; then, indeed, he may begin with the arms and legs, but not touch the chest."

In *flatulency*, he says: "Exercise must be used; first gentle, and afterwards stronger, *sensibly stronger*, such as may act upon the higher parts—which kind is most proper in all disorders of the stomach. Exercise should be followed by inunction and friction." If the stomach be affected with

an ulcer, he recommends "exercise and friction of the lower parts to be practised;" in *peripneumonia*, "if the patient can endure it, gestation, in order to dissipate; if he cannot bear that, moving him gently within the house; the use of friction, longest upon the shoulders, a little shorter on the arms, feet and legs, gently over the lungs: that is to be done twice a day."

In Books III. and IV. of CELSUS, we find different modes of application of active and passive movements in several forms of acute and chronic disease, viz.: "In coldness of the extremities preceding fever; in shuddering before fever; in tertian and quartan fevers; in several kinds of madness; in coeliac disorders; in dropsy; in several kinds of consumption; in epilepsy; in jaundice; in elephantiasis; in epileptic fits; in palsy; in pains of nerves; in tremor of nerves; in internal suppuration; in pains in the head and hydrocephalus; in palsy of the tongue; in disease of the neck; in difficult breathing; in coughs; in blood-spitting; in disorder of the stomach; in pains in the sides; in peripneumonia; in disease of the liver; in disorder of the spleen; in coeliac distemper of the stomach; in distemper of the small intestines; in dysentery and simple purging; in disease of the womb," &c. A long list, indeed; which is recorded only as an instance of the extent to which the mechanical agency was used and recommended among the ancients.

3. ARETÆUS* recommends active exercises—among which are separately named Chironomy (exercises of the hands) and Vociferation—in cephalœa; in epilepsy; in elephantiasis; in gonorrhœa; in melancholy; in vertigo:—passive exercises (*a*) *frictions*, in cephalœa, in coeliac disease, in epilepsy, in lethargy, in marasmus, in hæmoptysis, in vertigo; (*b*) *gestation*, in cephalœa, in colic, in epilepsy, in gonorrhœa,

* "ARETÆUS the Cappadocian: The Extant Works of." Translated by F. ADAMS, LL.D. London.

in lethargy, in melancholy, in threatening marasmus from syncope, in calculus of the kidneys, in hæmoptysis, in vertigo, in inflammation of the vena cava; (*c*) *dry cupping*, in apoplexy, in hysterical convulsions, in cholera, in pneumonia, in ileus, in phrenitis, in calculus in the kidneys. ("Dry cupping also has sometimes removed the stoppage of stones.") The cure of cephalœa: if the progress be gradual, the patient to take exercises in the erect state of the body, for the benefit of the chest and shoulders, the *chironomy*, the throwing of the *halteres;* leaping, and well-regulated contortions of the body accompanying it; friction, first and last on the limbs; of the head, in the middle of the process."

A case of vertigo is quoted here, as an example of the treatment in use at that time:—"The patient to be assisted during the paroxysms thus: The legs are to be bound round the ankles and knees, and the wrists and the arms below the shoulders and the elbows; the tonsils to be tickled, to provoke vomiting; frictions of the limbs, by means of rough towels, so as to produce rubefaction; then of the back and sides; last, of the head. Afterwards, exercise in walking, gentle at first, and in the end carried to running; in the middle, rest and tranquility of the breathing (pneuma) after walking. They are to practise vociferation, using grave tones, for severe occasions, distension of the head, palpitation of the temples, pulsatory movements of the brain, fulness of the eyes, and noises in the ears. Sounds of medium intensity are beneficial to the head. Then the time of gestation (riding, &c.) should be regulated so as to promote the getting rid of the weight in the head; it should be prolonged, yet not so as to induce fatigue; neither should gestation be made in tortuous places, nor where there are frequent bendings of the road, for these are provocative of vertigo. But let the walks be straight, long, and smooth. If, then, the patients have been in the habit of taking lunch, only a little bread must be allowed, that there be no impediment to the

exercises; for digestion should take place previously. The head and the hands, and the frictions thereof, are to be attended to; in the latter, it is to be gently performed, for the restoration of the heat, for plumpness and strength. Then the head is to be rubbed, while the patient stands erect, below a person of higher stature than himself—Gymnastics, skilfully performed, which tend to distension of the neck, and strong exercise of the hands. It is proper, also, by raising the head, to exercise the eyes at chironomy, or at throwing the quoit, or by contending in boxing. The exercises both with large and small ball are bad, for the rolling of the head and eyes, and the intense fixing of them, occasion vertigo. Leaping and running are very excellent; for everything that is vigorous is beneficial to the limbs, and gives tone to the system. . . . . There should be rest after exercises, to allay the perturbation. Pinching of the head, even to the extent of producing excoriation of the skin."

4. From the universal genius, GALEN, whose rank in the medical world has been compared to that of ARISTOTLE in the scientific, we ascertain that mechanico-medical treatment was in no way less estimated as a therapeutic agency than in the time of CELSUS, or about a century previous. He adopted frictions of different degrees, and is said to have himself invented and recommended a system of exercises which occupied the body and mind simultaneously. No one among the ancients so forcibly points out the various effects which attend different forms and degrees of active and passive movements. So for instance he says: "*Every movement is not an exercise*, but only the more or less strong movements; the limit of power of an exercise is the change in the respiration. Because exercise is a strong movement, the three first consequences that result in the body which is the subject of it, are—the organs become harder by the one rubbing against the other, the innate heat is increased, and

the movement of pneuma (respiration) becomes more violent." He adds: "We must not at all neglect corporal movements, as some do who cultivate science with energy; we must, on the contrary, exercise the body and its several parts by movements of equal force, by practising all sorts of exercises, so that every part may execute its own proper function. The movements we make ourselves are the most useful, because they have their starting-point in the interior of the body."*

He doubts "whether the preservation of health belongs more to medicine or to gymnastics," and strongly opposes the athletic and other violent exercises into which Gymnastics in his days had already degenerated, which were the forerunners of the decline of this important art among the Greeks and Romans.

Galen seems to have further developed the Hippocratic doctrine of frictions, as seen by the following (his) classification :—

Quality.		*Quantity.*
Hard	and	Much.
Soft	and	Much.
Moderate	and	Much.
Hard	and	Little.
Soft	and	Little.
Moderate	and	Little.
Hard	and	Moderate.
Soft	and	Moderate.
Moderate	and	Moderate.

It may not be superfluous here to point out that the question, "*What ought to be adopted in Gymnastic exercises?*" has not escaped the attention of this great physician. "Non omnis motus est exercitatio" is a doctrine so old and so long considered true, that LING, in founding his system, was

* ORIBASE.

obliged to rest his main support on this absolute law, in order to obtain strict "selection, simplicity and correctness" in all the branches of Gymnastics. It is, therefore, worthy of remark, that this law has lately been entirely rejected by the *savants* and gymnasts, who pretend that systematic Gymnastics must contain everything that is possible to execute for the various joints of the human body, isolated or together, with or without apparatus. The capital point in this question is, therefore, the contrast existing between *rational selection* and *unlimited possibility*.*

It should also be mentioned that the different character of many exercises had not escaped the observing genius of GALEN, in so far that he considered it necessary to classify them into quick, slow, strong, moderate, determined, &c. He also made a distinction between exercises correctly and incorrectly executed.

This is also remarkable in a historical point of view, because since the development of modern science there have been learned men who consider all kinds of exercise to have but one effect, alike for all. These *savants* look upon as pedantic, every attempt to discover important specific effects in certain movements. Such an absolute generalisation might be excused as long as experience had not proved the different effects of the same movements applied to different tissues or organs.

JOH. MÜLLER has the following statement in his Physiology well worth remembering:—"*The same agency* when it acts on different parts, organs and tissues, *produces correspondingly different* effects; and *the most dissimilar agencies* produce *the same phenomena of reaction* when they act on the same parts, organs or tissues."

As a consequence of this we find that some recommended

* Compare "Berliner Turnrath," 1861–62. Dubois-Reymond, Carl Bock, Herman Meyer in Zurich, Lion, Angerstein, Maul, and the writings of other authors on this subject.

only walking, others only riding on horseback or in a carriage, others only sawing, &c. &c.

These ideas are undoubtedly founded on the truth that all active exercises have something in common as to their general physiological action (see some Handbooks on Gymnastics). These ideas have at present certainly not so many pronounced adherents as in the commencement of the century, when they formed one of the passive *vires inertiæ* that retarded the development of Gymnastics, in so far, that the examination of the difference in the form and action of the exercises was overlooked. This traditional conviction, however, is not yet completely abandoned (see the writings of BEHREND, E. FRIEDRICH, ROSENTHAL, SCHREBER, H. MEYER, &c.) An example is mentioned further on, proving that such an idea is still in full force in some countries.

So uniform a kind of corporal exercises as those mentioned above, have sometimes proved able to ameliorate or even cure different kinds of chronic affections caused by confirmed akinesia. Similar beneficial effects have also been observed to follow rowing, mangling, wood-cutting, pumping, turning, as well as the use of some already forgotten complicated machines, among which the celebrated *tremoussoir*—precursor to the several kinds of modern oscillatory machines—may be mentioned. But there yet remains a great number of cases which only yield to a full and comprehensive treatment of well-selected kinetic forms, active and passive. Besides, it is well to remember that an immoderate one-sidedness has led to such mistakes as to admit occupations such as playing at chess, bookbinding, sewing, watchmaking, printing, writing, &c., and other equally sedentary handiworks, among corporal exercises.

Nobody who has once seen or experienced what care and caution is required in the Kinetic treatment of certain diseases (organic diseases of the heart, hæmoptysis, intense spinal irritations, &c.), will doubt the truth of what has been stated

above. It was not from pedantic views, but from the force of circumstances, that LING was influenced to adopt such active movements as were sufficiently simple, and at the same time of a mild and sustained character, as well as passive and half-passive forms. Already JOACHIM CAMERARIUS observed in 1574 in his *Dialogues*, the necessity of returning to less violent forms of exercises than those in use during his time.

5. The physician and friend of the Emperor Julian, ORIBASIUS,* ranks next to GALEN among the ancient medical classics. He devotes almost the whole sixth book, p. 436 to 551, Vol. I., to the description of various applications of the mechanical agency. In the important question of the position of the body in different affections, he observes, that for patients suffering from the head the most suitable position is with the head raised higher than the other parts of the body, "except those with mental affections, because with them we prefer the horizontal position on the back." In the same manner in affections of the chest the raised position is recommended. The horizontal position on the back is suitable to patients with affections of the stomach, the womb, or the sides. In gonorrhœa, satyriasis, and affections of the kidneys, on the contrary, the patient should lie on one of the sides of the body, because these affections are aggravated by a dorsal horizontal position. "Those who have slow digestion should select the position on the left side," &c. Declamation, reading aloud, is insisted upon, and the different effect of a different pitch of voice enlarged upon.

Of frictions there are described several kinds: as morning frictions, evening frictions, preparatory frictions, curative frictions, apotherapeutic frictions, intended to be a restorative process, the object being "to combat and prevent the fatigue which generally follows more or less immoderate exercises."

* "Œuvres d'Oribase." Traductions par les Docteurs Bussemaker et Darenberg. Paris, 1851.

These kinds of frictions were often made with the retention of the breath. The curative friction ought to be practised, in young patients of small stature, by four persons; and by six persons on such as are full grown and of taller stature. Some frictions are from the upper extremities down to the fingers; others from the trunk down to the groin; others, again, from the lower extremities down to the feet. The friction should always be applied to each part from upwards in a downward direction. In the beginning the friction should be made gentle and slow; afterwards quick and accompanied by pressure; and towards the end the friction again should become gentle, and in every respect like as in the commencement. The head and the neck should also be manipulated. Every part ought to be acted upon by frictions: about a hundred times in young persons, two hundred times in grown-up persons, and double the number of times in athletic persons. Definite rules are given for every condition—the fever, the respiration, the pulse, perspiration, &c., more or less important and instructive.

6. PAULUS ÆGINETA'S seven books,* though essentially a synopsis of the works of his great predecessors, HIPPOCRATES, GALEN, AETIUS, ORIBASIUS, &c., is looked upon as one of the highest authorities in ancient medicine and surgery. A few extracts from his wise and pertinent observations relating to our subject will therefore be justified. On the regimen of infancy, and of the succeeding stages of growth, we have still to learn of him.

He says: "Infants and children when weaned from the milk are to be allowed to live merrily and without restraint; their food ought to be light, and *their exercise gentle.* After six or seven years of age, both boys and girls are to be handed

* "The Seven Books of Paulus Ægineta." Translated from the Greek, with a Commentary, by Francis Adams. London: Printed for the Sydenham Society. 1844.

over to schoolmasters of a mild and benevolent disposition, as such persons will impart instruction to them in a cheerful manner and without constraint; *for relaxation of the mind contributes much to the growth of the body.*" (The modern kindergarten system.) "Boys twelve years of age should go to teachers of grammar and geometry, *and get their bodies hardened by Gymnastic exercises.* From fourteen to twenty, their proper employment will be the study of mathematics, and initiation into philosophy. *At the same time, however, it will be proper to use more exercise for strengthening the body;* so that, exercising both mind and body, they may be prevented from indulging their carnal desires. They ought, likewise, to be restricted as to wine. To adults the fullest supply of nourishment, both as to body and mind, ought to be allowed; wherefore, *they should use all kinds of Gymnastic exercises, particularly such as each has been accustomed to,* and food which is sufficient and nutritious. In the decline of life, both the bodily and mental supply ought to be abridged; and *the Gymnastic exercises diminished in proportion.* The food also is to be gradually lessened as the habit begins to contract the frigidity of age."

With these wise, simple, yet comprehensive rules before us, in which Gymnastics enter in due proportion as important educational and hygienic instruments during the different phases of life, we explain with difficulty the want of encouragement that the reintroduction of Gymnastics has met from the medical profession up to the present time.

It has been shown that frictions with oil were practised among the ancients before and after their Gymnastic exercises; so much so, that Horace characterises an inactive person by his dread of oil—"Cur olivam sanguine viperino cautiùs vitat." On the preparatory friction, P. ÆGINETA says: "Before Gymnastic exercises the body ought to be rubbed moderately first with towels, and then with oil in the hollows of the naked hands, until it be properly warmed and

softened, and its surface has contracted a florid blush and become distended."

The observations of our author on the effects of exercise are pertinent and comprehensive. "Exercise is a violent motion. The limit to its violence should be a hurried respiration. Exercise renders the organs of the body hardy and fit for their functional actions. It makes the absorption of food stronger, and expedites its assimilation; and it improves nutrition by increasing heat. It also clears the pores of the skin, and evacuates superfluities by the strong movements of the lungs. Since, therefore, it contributes to distribution, care should be taken that neither the stomach nor the bowels be loaded with crude and indigestible food or liquids; for there is a danger lest they should be carried to all parts of the body before they are properly digested. It is clear, then, that exercise should be taken before a meal."

On the kind of exercise of the ancients, P. ÆGINETA is less comprehensive than ORIBASIUS; still he does not omit to recognise the difference in effects of such as require endurance and such as are characterised by swiftness, &c. "The common effect of all kinds of exercise is to produce an increase of the natural heat of animals. But each species has something peculiar to it. Strong, that is to say, violent exercises give vigour to the muscles and nerves: such are digging, and lifting a very heavy burden, while one remains stationary or moves about; or lifting small weights, and walking about to the extent of one's strength. Of this kind, also, is climbing a rope, and many other kindred exercises. The swift kinds of exercise are such as do not require strength and violence, namely: running, fighting with one's own shadow, wrestling with the extremities of the hands, the exercise with the leader bag, and that of the small ball. This last is a compound of intenseness and velocity; and such as are more intense may become violent by adding velocity to them. Besides, some kinds of exercise bring the

loins into action, and some the hands or legs; others the spine or the chest alone, or the lungs. And exercise ought to be carried on until the body becomes distended and the skin of a florid hue; and until then, the motions ought to be strong, equable and spirited, capable of exciting warmth and causing sweat, mixed with vapour, to break out. It will then be time for you to stop, when any of the symptoms which I have mentioned have undergone a change, namely, when the bulk of the body becomes contracted, or when the florid colour of the skin declines. And should any of the motions remit, it will then be time to stop immediately; or if there should be any change in the quantity or the quality of the perspiration; for if it should become smaller in quantity, or colder, we must desist, and, besmearing the body with oil, endeavour to restore it. It will then be proper to use the restorative friction (apotherapia), as the masters of Gymnastics are wont to practise it."

On the kind of friction, our author follows HIPPOCRATES and GALEN. "Hard friction contracts, and soft relaxes; so that those persons who are relaxed should be rubbed hard, and those that are immoderately constricted, softly. For much and hard friction diminishes the bulk of the body; whilst, on the other hand, little and soft distends it." There follow afterwards the three degrees of friction, as to quality and quantity, after GALEN.

On Vociferation, or the exercise of the voice, he observes that "Regular and gentle modulation can contribute nothing to health; but the utterance of louder tones is beneficial, and is therefore to be practised. For much air being inhaled, thus by respiration expands the chest and stomach, and dilates and extends all the pores of the body. Wherefore, even in reading, the excretion of redundant humours is promoted in those who read in a high tone, by inducing sweats; while in those who read in a moderate tone, it promotes the insensible perspiration over the whole frame. For by at-

tenuating the excrementitious matters which are brought up, the saliva, mucus, and phlegm are discharged and consumed. And to those who stand in need of warming on account of their frigidity, what mode of relief can be more proper than the action of respiration? Such persons ought, therefore, to read frequently; and, relaxing the whole body, so as to distend the windpipe and all the other air passages, endeavour to utter the loudest sounds. And yet we must not have recourse to the exercise of the voice rashly and without consideration; nor when the system is filled with depraved humours, or the stomach loaded with crudities, lest noxious vapours be thereby distributed over the whole body."

In cases of lassitude produced by the exercises, which he divides into the ulcerous kind, the tensive, the inflammatory, and a fourth kind, occasioned by an unnatural dryness of the muscles, the author recommends in the first case, "to dispel the superfluities by much and soft friction with plenty of oil, devoid of astringency. In the second instance, relaxation should be produced by means of little and soft friction with oil heated in the sun, by quietude, and by repeated tepid baths. In the third species, plenty of tepid oil, the softest friction, and remaining in a bath of moderate temperature, should be the methods used. Long continued quietude is also proper, and repeated inunction. The treatment of the fourth species differs not from that of the third for the first day, except that the water ought to be hotter; and on the second, the restorative kind of exercise must be had recourse to; and when in the bath, let the person straightway leap into a cistern of cold water. All those affected with lassitude stand in need of wholesome food."

With these few words about, and extracts from, the ancient medical classics, the writer has only desired to show that their ideas of Gymnastics essentially correspond to the principles of Gymnastics of our days as to the chief sphere of

Gymnastic action and uses. These celebrated authors, especially GALEN, mention besides many facts and observations about the mechanical agency which space forbids reproduction here.

To what a high position Gymnastics had attained among the Greeks, as an element in their social life and national education, allusion has already been made, and, moreover, it is known to every one. But few, perhaps, have realised the significance of the historical fact, that the Olympic games formed for centuries the common chronology of the different states and colonies of Greece. The fall was great, and no doubt well merited as a consequence of the known fact, that the Gymnastics with the nation decreased in the same measure as the tests for the championships at their games had become more difficult, and the personal emulation and prizes had been limited to but a few of the most distinguished athletes, whilst the masses of the people remained merely passive spectators. In our century the name "Gymnast" includes everything that is low and degrading—a mountebank with his vagabondage and ignorance, a profession the embracing of which every good mother deprecated most for her son. In order to avoid this obloquy the celebrated German patriot, JAHN, exchanged the dishonoured name to "*Turnen*."* Other estimable pedagogues, such as VIETH, GUTSMUTHS, PESTALOZZI, &c., who ventured to treat the despised subject, showed great courage in daring to meet the adverse opinion of the public on this matter. In our days, when moral forces have obtained such pre-eminence, Gymnastics will never attain to the same standing and influence as it once held in Greece and Rome. Still, let us hope that the modern attempts at its regeneration may at last attain for it a recognised position in the service of moral and physical health, as well as in that of social order.

* The writer in first adopting such a denomination as *Kinésitherapie, Movement-Cure, Kinesiatrics*, &c., instead of Medical Gymnastics (Ling), has principally been influenced by a similar motive.

Learned authors, from FUCHS and MERCURIALIS, to KRAUSSE, BECQ DE FOUQUIERE and BINTZ, have written and enlarged upon the Gymnastics of the Ancient Greeks and Romans. Besides OLAUS MAGNUS and VIETH, no writer has, as yet, sacrificed any time and effort to collect and describe from old "*sagas*" what the Scandinavian ancestors possessed in sports, games, &c., corresponding to the Grecian Gymnastics.* As to these matters, the writer is obliged to limit himself to the following two remarks. The active forms of exercises, of which traces are to be found in old Northern authors, embrace a totality, the Gymnastic value of which fully equals the celebrated Pentathlon, Pyrrhikai, Pancration, &c. These exercises were regulated by strict laws, which aimed at preventing extreme roughness, and encourage fair play; and indicate by their peculiar nomenclature, a rich variety of forms. Different forms of passive movements, such as frictions, kneadings, laying of hands, &c., were partly confined to the practice of clever, high-born women; and also remained as a royal privilege in the hands of the kings and earls—a right which afterwards was transmitted as an inheritance to the Christian kings up to modern times.

During the period that followed the fall of Greece and Rome, we gradually lose sight of the traces of the mechanical agent in medicine, though AVICENNA, HALY ABBAS, &c., give special statements as to the important effects of exercises. So, according to HALY ABBAS: "Exercise is useful for three purposes: 1. For rousing the innate or natural heat, whereby the processes of digestion and distribution are accelerated; 2. For opening the pores of the body, and getting rid of its superfluities; 3. For strengthening and rousing up the

* With the exception of Dr. Saeve of Wisby, who with great diligence has made a large collection and descriptions of ancient Northern games; which unfortunately, however, from want of public encouragement and support, has not yet been published.

animal activities, by the friction it occasions." HALY ABBAS and AVERRHOES give the same directions about friction as laid down by GALEN. AVICENNA, in giving an account of vociferation, follows AËTIUS. He says that it exercises the parts about the mouth and chest, and hence that it improves the complexion. He cautions us not to prolong loud enunciation, lest it occasion a rupture of the vessels. He directs us to begin moderately, and then to strain the voice gradually, and afterwards to allow it to sink by degrees.*

Probably some other authors may be found, who, during the middle ages, have expressed opinions on our subject. Into these the writer does not intend to enter. So much more numerous are the authors who have written on the matter since 1500. Among the opinions the writer refers only to some medical authorities. But before doing so, he wishes to record *en passant* that the great Reformer LUTHER also is said to have recommended corporal exercises.†

Medicine, through the influence of the school of the Arabs, of PARACELSUS, &c., obtained a direction more and more chemical. However, at the end of the seventeenth century a new doctrine arose, namely, the Iatro-mechanic, with BORELLI at its head,‡ which undertook to explain the phenomena of life from a mechanical point of view. Whilst this distinguished mathematician explained the mechanical action especially of the muscles, BELLINI, CASTELLI, GUGLIELMI, SAUVAGE, PITCAIRNE, CHARLETON, KEIL, JURIEN, MEAD and FRIEND§ assisted in extending this explanation to all the

* Dr. ADAMS' learned Commentaries to Paulus Ægineta.

† Dr. FRANZ PASSAU, "Turnziel." Breslau, 1818. The accounts which PASSAU and other authors have given in relation to a letter on the subject, alleged to be from LUTHER, have lately been the object of critical remarks in respect to its identity.

‡ BORELLI, "De Motu Animalium," which work he dedicated to the learned Queen CHRISTINA of Sweden.

§ BOSTOCK, "Hist. of Medicine."

functions and actions of the body, both in health and disease. Although the Iatro-mechanic school has hitherto exercised but little influence on therapeutics, it has had all the more influence on physiology;* and this is seen more or less in the physiological works of any importance in our days: Bernouilli, Euler, Hachette, Bartez, Maissiat, Barclay, Magendie, Bell, Weber, Flourens, Claude Bernard, Marey, Dubois-Reymond, Pflüger, Schiff, Heidenhain, &c., explain the material phenomena in the human body, and experimental physiology refers to mechanical and physical laws for the explanations of the vital functions. From the elaboration physiology thus obtains, the mechanical agency receives its chief support, viewed as one of the healing powers. It would go beyond the limits of this paper to refer to all the workers in physiological research in the present time; besides, the writer's occupations have not permitted him to follow up this great and enlarged field of study.

In the following statements a full chronological order cannot be closely observed.

7. The learned Fr. Hoffmann, remarking that movements are the best preservatives of health, says: "Movements constitute surely the universal medicine: there is in nature no remedy that can render such complete service to the human body, because they facilitate almost all the evacuations, without causing any loss of force. Galen has well understood this when he says (Com. XI. 53): Exercise causes the purgation of the vitiated humours which are in the body. Sanctorius, so often cited with approbation, appears to be of the same opinion, when he says: If men practised phy-

* It seems as if this period ought to have been one calculated to give a new impulse towards a resuscitation of a rational Gymnastics. On the contrary, we find with astonishment that, during this period, the last traces of many of the Gymnastic games among the continental peoples were lost.

sical exercise and labour, they would be able often to do without doctors and drugs. From this VERULAM (Libr. IV., De Augment. Scient., Ch. 9) says that it is scarcely possible to discover a single symptom of disease which cannot be ameliorated or cured by an appropriate exercise. According to AVICENNA (Liv. I. Ch. 1) man would be able, if he devoted himself at proper seasons to exercise and labour, to do without medicines and doctors. Therefore nobody ought to be astonished that movements also produce effects on the mind; because, having such a remarkably salutary effect on the body, it is inevitable that the mind, from its intimate connection and union with the body, should also experience some change. PLINIUS observes that it is extraordinary how the mind becomes awakened by agitation and physical movements; and SENECA, in his work on tranquillity (Lib. I. p. 56), affirms that the mind expands with those who take walks in the open air."

The author defends running, playing at ball, and dancing, for those whose veins are full of thick blood; but recommends riding on horseback to patients suffering from chronic disease, to hypochondriacs, to the desponding, to dispositions to phthisis, hectics, &c. In accordance with the ancients, of whom he quotes HIPPOCRATES, CELSUS, PLUTARCH, ARETÆUS, he recommends strongly the exercise of the voice. He recommends also frictions, and observes: "In the same way as the most useful remedies become more injurious than salutary if not regulated by prudence, order, and appropriate regimen, so also with a movement, a different practice of which may be injurious to health or restore it. Experience has indeed proved that excessive exercise causes exhaustion and weakness with man as well as in animals." FR. HOFFMANN also observes: "If a pressure is made on the phrenic nerve from above downwards, a revivification of the diaphragm is obtained."

8. Some years later, WILKINS,* HUNDERTMARK,† DU FRESNE,‡ and others, show in special dissertations the usefulness of frictions, and advocate their readoption in the healing art; and TISSOT, in his work on medical and surgical Gymnastics, although he enumerates only exercises such as walking, leaping, running, dancing, hunting, fencing, riding, swimming, playing at ball and shuttlecock, &c., yet makes at all events an attempt to treat the subject scientifically. These exercises being of a too heterogeneous and indefinite character, can only be employed exceptionally for therapeutic purposes. They are essentially recreative exercises, and as such they are of hygienic importance, especially when not carried to excess, and if performed in the open air.

Even later, as in the works of Drs. KOCK, LONDE§ and FOISSAC upon the subject, we find ideas advanced in favour of medical Gymnastics; but they had only a nominal existence, so long as a method was not found by which the localisation and systematising of active and passive movements had been attained, as in LING'S system.

9. Reverting to Dr. TISSOT, we find in reference to the treatment of sprains the following: "Many remedies have been proposed for sprains, among which there is one which is not enough made use of, consisting of a kind of kneading applied to the affected part. In pounding, so to speak (however, with a certain amount of precaution), in triturating the viscous fluids arrested in the ligaments of the articulation, an

* "De Frict. util. in medicina. Disp. med. inaug." 4o. Lugd. Bat., 1716.

† "Diss. de Singulari usu frictionis et unctionis in curatione morborum." 4to. Leipzig, 1740.

‡ "Diss. inaug. med. de frictione."

§ LONDE, "Gymnastique medicale." Paris, 1821. It is but just to observe that Londe has the rare merit of recommending simplicity in the Gymnastic formulæ, which seems not to have been understood by later critics, and still less in Manuals for Educational Gymnastics, 1840—50.

activity is given to the circulation, which had almost been lost. The ligaments are thus prevented from forming, as it were, one single obstructive mass, in which all movement has entirely ceased. It seems forgotten that tumours, often of considerable size, are almost daily made to disappear, by kneading them several times in the course of the day."*

In another place (p. 28), this wise physician makes the following observation: "A movement can often be used instead of medicines, but all the medicines in the world cannot be substituted for exercise."

10. It is well known that the great SYDENHAM recommended riding on horseback or riding in a carriage as a treatment for several complaints. In a case of bilious colic, he says: "There is nothing that I have hitherto been able to think of, that is so certain a means of effecting a cure as riding on horseback, or in a carriage in the case of long journeys. In the meanwhile, an anodyne must be taken regularly, night and morning. By exercise of that kind, the matter that sets up the disease is brought down to the habit of the body, and the blood, being comminuted by the perpetual agitation, is depurated, as it were, afresh; whilst the bowels themselves, by the excitation of the native heat, are not a little strengthened and restored. I am not ashamed to own, that by calling in to my aid this sort of exercise, I have more than once thoroughly cured the disease, when I had been unable to cure it otherwise."† He mentions also a case of a poor neighbour, to whom he lent a horse out of his own stable, in order that he might take a journey after the manner prescribed, the virtue of the anodynes having been spent. After having travelled a few days, his bowels grew strong enough to enable him to throw off the relics of

* TISSOT, "Gymnastique médicale et chirurgicale." Paris, 1780. P. 255.

† The Works of Thomas Sydenham, M.D." Vol. I. p. 197.

the disorder. In this way he was thoroughly cured without the anodynes.

"To speak of things as they really are, I have found that this sort of exercise has been used with good success in most other chronic diseases. If we consider that the lower body, wherein lie the organs of secretion, is shaken by it to the extent of some thousand succussions a day, one may easily conceive how it may be enabled thereby to shake off any of the excrementitious matters there impacted; and also that it may be so strengthened by that powerful excitation of the native heat, that it shall duly do the work in the department which nature has assigned it—the depuration of the blood."

The father of English medicine, as he has been called, has an expression which in general seems not to have obtained sufficient attention. He says: "However much these and the like medicines may do good, *they are insufficent, single handed. We must look beyond medicine. Wise men do this in gout, and in all other chronic diseases.*"

In hysterical colics, he says: "Of all the remedies that I know, nothing so cherishes and strengthens the blood and spirits as riding on horseback, long distances, every day." He mentions a friend of his, in holy orders, who from long studies fell into hypochondriasis: "He consulted me, and I saw at once that there was no room for medicines. These had been tried too long, and too much in vain as well. I recommended riding on horseback, at first short rides, such as his health would allow. Had he been a man of a less acute judgment, he would never have been induced to try it. However, I asked him to persist in it till recovery. He increased the length of his exercise every day, until at last he took a journey rather than a ride. So he went on, until he got to twenty or thirty miles a day; and finding himself, after a few days, much better, kept on for some months. Indeed, as he told me himself, he rode more than 1000 miles, by which time he had gained perfect health."

"Riding," he continues, "is as good in a decline or in phthisis as in hypochondriasis. It has cured patients whom many medicines would have benefited as much as so many words—and no more. This, too, not only in mere cases of cough and weakness, but after wasting, night-sweats, and colliquative diarrhœa have signified the approach of death. '*Ultima linea rerum.*' Indeed, deadly as phthisis is, killing two-thirds of those who die of chronic diseases, it has a specific in riding, as truly as ague has in bark or the venereal disease in mercury, provided only the journeys are long enough, and the beds at night are well aired. Those, too, who have passed middle age must keep it up longer than those below it. Besides horse exercise, driving in a carriage has had wonderful effects."

In gout: "In respect of the kind of exercise, riding on horseback, unless forbidden by either old age or a calculus, is by far the best. Indeed, I have often thought within myself, that if any person knew a remedy, of which he wished to make a secret, equally efficacious in gout, as in most chronic diseases, with regular and steady riding on horseback, he might make a fortune. Where this cannot be done, driving in a carriage comes to next the same thing."

It appears as if Sydenham, in his advice to take daily longer and longer rides on horseback, had been led by *one* of the vital principles of our medico-gymnastic treatment, viz., to take advantage of the forces of the patient in the measure they return, or to increase proportionally his exertions in the degree that he gets stronger. It was on this same principle (a universal one for Gymnastics) that the celebrated Greek athlete, commencing daily to carry a calf on his shoulders, his strength developing equally with the weight of the animal, finished by carrying a full-grown ox in the arena, to the astonishment of the whole assembly present.

11. The following case illustrates the ideas of Sydenham,

though modified and occurring more recently:—"Mr. W., a medical student at Upsala (Sweden), afterwards a physician of considerable repute and great popularity at Stockholm, was attacked in 1826, during his medical studies at the University, with a gastric fever (febris nervosa lenta gastrica, in hecticam, cum decubitu abiens), which had lasted a couple of months, and which, in consequence of the long-continued decubitus, became complicated by a bed-sore on the sacrum, which did not seem inclined to heal, any more than the disease in general tended towards recovery. It was considered that too assiduous studies in preparation for an examination, together with youthful excess, had weakened the vital forces; and besides, the young man, who had a passion for music, was in the habit of playing the guitar and of singing till he was quite exhausted: then came sleeplessness and disturbed nights, alternate fits of heat and cold, night perspirations, as the general premonitory symptoms. At last the strength gave way, the irritability increased day by day, and it was in this extremity that Dr. PETER AFZELIUS, who at that time enjoyed the highest repute as a physician in Sweden, was called in. The old doctor, after having well examined the patient, said only: "I will come again to-morrow and tell you what to do." It was in the beginning of the summer, about midday, when he arrived; and, as was his wont, after having a long while looked at the patient without uttering a word, he at last said: "I have arranged for you to start this afternoon; you must return to your home and your parents. At 5 o'clock your friend, Mr. SÖDERBERG (also a medical student), will come and fetch you with a cart (these carts are in Sweden on two wheels and without springs); you will have to go to the Högsta Station this evening." "What you say, sir," replied the patient, "is quite impossible. I should die for certain even before I arrived at the first station." "Then, my renown as a physician would also be destroyed," replied the old Archiater; "you must go."

"I have not even enough strength to go downstairs and to step into the carriage; and then the sore!" "I have considered everything; I have procured a strong man as coachman, who, with the aid of Mr. SÖDERBERG, will carry you down and help you up in the cart. You know that the back in our carts consists of only one narrow board, which does not touch the sacrum. You cannot take cold at the station because I have already ordered your room to be warmed and the bed aired." At last, after much discussion and contradiction on the part of the patient, the doctor said: "You would certainly have died here, indirectly, from sheer weakness; but you will not succumb from the fatigue of the shaking of the cart in the pure air. Good bye! *au revoir* until the autumn, when I hope to see you quite restored." These were the last words of the old physician whilst shaking him by the hand. My friend SÖDERBERG (said our narrator), told me afterwards that "Mr. W. held himself upright in the cart, and he even commenced to speak during the first day; that during the journey, which lasted above a week, he gradually got stronger, and that the bed-sores were quite healed on his arrival home. The patient returned in the autumn in perfect health to resume his studies." (Dr. LIEDBECK, reminiscence from Upsala, in a letter to the writer, who was personally acquainted with Dr. W. in Stockholm.)

12. The writer remembers a case mentioned by old LING, as an instance of the influence of a severe, rough and irregular shaking of a carriage. A medical man, of great repute in the south of Sweden in the beginning of the century, Prof. MUNCK of Rosenskiöld, M.D., in his way a great character, had often been consulted by a wealthy burgher of the place, Malmoe, for an obstinate constipation: when at last, having exhausted all resources of medicine, he said: "I will yet try a last remedy for you, but if it succeeds it will cost you a

thousand riksdaler." After much haggling he consented, when the doctor said: "Put your horses before the old manure cart, and we will drive together up and down the streets as fast as the horses can run." No sooner said than done; it was not long before the effect began to be felt, especially as the pavement was of the roughest kind; the burgher soon called out, "turn home with all speed or it will be too late."*

Constipation is often a result of travelling by rail or steam from the vibration. There are examples of continued over-exertion having caused torpidity of the bowels; which, again, in other persons, have been relieved by a short drive.

13. Dr. LIEDBECK (whose name will often be mentioned in these papers, and who was in his old age a sufferer from asthmatic symptoms depending on fatty degeneration of the heart, of which he ultimately died), mentioned in a letter to his son, Mr. A. LIEDBECK, that he always experienced great relief from his dyspnœa from a railway journey. These observations seem to prove that a continuous vibration, even of a rough and primitive kind, may in certain cases produce great effects. This will help to explain the cause of repeated attempts made at constructing machines for producing succussions as far back as before the time of BÖRNER.

In the same manner as a distinction has been made in Gymnastic practice, of frictions of different degrees (see further on), it becomes necessary to distinguish between the rough "quassatio" which formerly was used by the aid of the horizontal vibratory mast (wippmast, Schwebebaum), at the Gymnastic Central Institution at Stockholm, and the more gentle and

* At the same time the writer remembers an advice of LING as a guide to the Gymnastic physician: To collect and observe diseases in workmen of different trades, deformities, anecdotes of physicians, positions in different diseases, habits and movements of the higher animals, &c. LING, "Collected Writings." Stockholm, 1866.

fine oscillation, which, applied by the hand, has also been made by the aid of machines. In order to explain these differences, one may suppose that in the former case a uniform "*va et vient*" sinks as far as 450 per minute, whilst the graphic tracing increases to one decimetre or more. In the case of the oscillation, it is supposed that, for instance, a vibratory motion applied to the chest in a delicate person, the number of motions most appropriate amount to upwards of one thousand per minute, or more, whilst the graphic tracings would show only five millimetres.

14. FULLER* was one of the first who again recalled to memory the power of exercise in curing disease. Following in the wake of the great SYDENHAM, he advocates principally riding on horseback, and his system, such as it was, could consequently be but of limited application; still he asserts that, by that means alone, he had cured himself of itch, and mentions also some cases of consumption, dropsy, hypochondriasis, nervous disease, thus successfully treated. In the ninth edition (1777), a series of rhythmical exercises for the extremities is recommended by "an eminent physician", which it is alleged "conduce much to an easy respiration, prevent asthma, promote perspiration and other excretions from the blood, &c."

15. JOHN HUNTER,† in cases of sprains, observes: "Sprains often remain very painful after the original symptoms have been removed; this pain is often got rid of by giving the part motion, as if some part were moved into its place by that motion; but it is most probably by the motions giving the parts an opportunity of adapting themselves to each other's action." (See further on about Sprains.)

* FULLER, "Medicina Gymnastica; or every one his own Physician. London.

† "The Works of John Hunter." London, 1835. Vol. I. p. 518.

16. ERASMUS DARWIN* recommends friction in "paralysis brachiorum," and relates a case of hereditary consumption, cured by gestation and long journeys on horseback. In calculus renalis he recommends frequent change of posture, and frequent horizontal rest in the day. He observes that bandages increase absorption, if fitting nicely, &c.

17. The writer's late and lamented friend, the zealous and distinguished supporter of the introduction of LING'S system into England, Dr. M. J. CHAPMAN,† relates his own case of *agrypnia*, cured by riding on horseback, as follows. "The writer," he says, "had gone to Edinburgh for his last medical session. He was a clinical clerk at the infirmary, and was an active president at the Royal Medical Society; and he had to prepare for his examination, for which purpose he was a pupil of the excellent FLETCHER. He was lodged in that unlovely street known as College Street. During an intensely cold night, he was summoned from his bed by his landlady, to see the maid-of-all-work, who had been suddenly taken ill (in labour pains). He saw her in the homely kitchen of the second *flat*, and he had, in consequence of exposure in a bitter cold night in the mid-passage of that villainous flat, a severe attack of meningitis. He was in those days a hard student; his brain had been taxed to the full, by reading, and lectures, and hospital practice, for he had to prepare notes for the clinical lectures, besides his other kind of necessary work. Inability to read, or sleep, or think; a quick wiry pulse, headache, and other such symptoms, took the pluck out of him—at that time, he had more than enough of pressure. He went to his masters of the infirmary, to the

* "Zoonomia; or, The Laws of Organic Life." By ERASMUS DARWIN, M.D. London, 1796.

† "Ling's Educational and Curative Exercises." By M. J. CHAPMAN, M.D. Cantab. Including the last edition, edited by the writer, after the death of the author, this pamphlet went through four editions.

dons of the university—they all scouted the idea of there being inflammation of the brain! 'You have worked too hard; live generously, shut up your books, drink wine, and work no more for the present.' In the matter of reading, he could work no more; but he had himself bled once and again. He was not plucked; and at the close of that year he went to British Guiana, six degrees from the equator. For nearly twelve months he did not sleep more than two hours in the twenty-four, sometimes not one hour, sometimes not at all. After trying everything he could think of, he bethought himself of horse exercise, and pursued it steadily, riding for very many hours every day, and gradually his sleep returned to him; from that time to this he had slept like a top."

"The case of CURRIE (cold-water CURRIE) is given in DARWIN'S 'Zoonomia.' JOHN WESLEY also cured himself of phthisis in the first stage by riding."

Dr. CHAPMAN also mentions "a case of *porrigo decalvans* in which all the hair had perished and there was entire baldness, in which a complete cure was effected, chiefly by gentle manipulations and kneading of the scalp. The hand only was used, and no external application of any kind."*

18. Dr. SABATIER, in his "Traité d'anatomie," Paris, 1781, p. 230, mentions the following interesting case, related by Valsalva: "A woman was wounded in one of her eyes by a turkey-cock which she tried to catch. A small quantity of blood escaped from the wound, and she at once lost the sight of the eye. Several remedies were used without producing any relief. Three days later she came to consult VALSALVA, who could not detect any external or internal lesion of the eye. In thinking over the case, VALSALVA imagined that if a somewhat strong friction was made along the supra-orbital nerve, it would perhaps cause an advantageous change in the

* *Ibid.*

eye. He had scarcely commenced, when the patient recovered her sight.

"VALSALVA attributes this success to the cessation of the spasm, which, he thought, had attacked the muscles of the eye, and the freedom given to the optic nerve, which he supposed to have been strangulated. But it is more likely that the effect was owing to a sudden vibration caused in the interior nerves of the eye."

This recalls a process generally adopted among the fencing-pupils at the Central Gymnastic Institution, Stockholm, when anyone had accidentally received a thrust in the region of the eye, his comrade used for his relief a *strong* friction round the eyebrow, or rather around the injured part. (See art. on Friction and Massage.)

19. From Captain COOK and other travellers,* we learn that in India, China, Turkey, Egypt, &c., modes of treating diseases exist under the names of "shampooing," "massing," "flagellation," &c.; and that these manipulations occupy in the East an important position in the treatment of rheumatic as well as in external disorders, and in some measure also in internal diseases.

20. Dr. CHAPMAN, in an interesting paper, relates the

* "Osbeck's Reise nach Ostindien ünd China, nebst Torèn's Reise nach Surette a. d. Engl.;" Rostock, 1765. "T. H. Grose, Reise nach Ostindien a. d.;" Französ, 1755. "Hawkesworth's Geschichte der Englischen See-Reisen," &c.; Berlin, 1775; B. I. p. 33. "Forster's Reise um die Welt;" Berlin, 1784. "Leben des Captain James Cook," von Andrew Kippés, a. d. Eng; Hamburg, 1789; Book II. p. 371. In consequence of these records, shampooing was long ago proposed to be introduced in the treatment of diseases by several German physicians. ("Unzer's Arzt," B. VI. p. 561; "Baldinger's neue Magazine für Aerzte," B. X. p. 248.) Beneficial results from its application have been observed in œdematous swellings, profuse perspirations, induration of glands, and rheumatic affections. ("Weinholdt's Heilkunde," B. I. p. 11; B. II. p. 67—175; B. III. p. 168—193; and "Burdach's Physiologie," p. 277.)

following: "The Indian magicians and the Persian physicians, who preceded in point of time the medical school of Egypt and Greece, chiefly employed gestures and passes with the hand and *manipulations* for the cure of disease. Whether the cure were real or not, this passage of PHILOSTRATUS, in his life of APOLLONIUS, shews the mode of attempting cures in recited cases. A young man who was lame from a wound inflicted on his knee by a lion, went to the wise men of India in the hope of obtaining relief. They *rubbed* him gently with their hands, and so successfully, that he was able, in a few days, to return home without any pain or lameness. They recovered, by using the like means, the sight of an eye which had been lost, in the case of another of their patients; and in a third instance they quite cured a man who had lost the use of his arms."*

21. In "Notes and Queries," June 20, 1857, is found the following "*Curious Parallelism of Customs.*—It is a custom in Berwickshire, among women-workers in the field, when their backs become very tired by stooping while hoeing turnips with short-handed hoes, to lie down with their faces to the ground, and to allow others to step across the lower part of their backs, on the lumbar region, with one foot, several times, until the pain of fatigue is removed. BURTON, in his 'First Footsteps in East Africa,' narrates a very similar custom amongst females who lead the camels; who, on feeling fatigued, lie down at full length, face downward, and stand on each other's backs, trampling and kneading with their toes, until they rise like giants refreshed."

When the writer, in the year 1853, applied a nerve-pressure, directed to the supra-orbital and temporal nerves, on a patient, a lady, who had spent several years in India, she spontaneously observed "that the Hindoo women were

* M. J. CHAPMAN, "On Animal Magnetism," "British Journal of Homœopathy," 1856.

in the habit of using strong pressures on the temporal region, and even used to apply a band round the head, in order to exercise a pressure on this region, in cases of headaches." She stated "that she always found herself relieved by their manipulations, which were generally finished up by their binding a band tightly round the head."

Mr. ADAMS, now deceased, who had lived in China (the English settlement) as a judge, told the writer (for whose Kinetic treatment he had been sent by the late Dr. CHAPMAN), that it was a habit among the Chinese, once a year, to pinch the skin round about the neck, as a prevention of illness: to make the process more effective, they take the folds of the skin and press them between two copper coins. The Chinese Kong Foo should also be mentioned here, consisting in a certain number of positions used in the treatment of disease. (See art. on Massage.)

As a complement to these few facts from the East, in relation to our treatment, the following account of some popular manipulations in Greece might be added. They were as long ago as 1849 mentioned to the writer by a Greek lady, Countess de R., then under his treatment in Paris. "It is the custom in Greece among the people to bind a band tightly round any of the extremities, in cases of engorgements, pains, &c. (see further on). When the leg is asleep (engourdie), percussion on the knee-cap is used."

"Against headaches, pressures on the temples are used with great success."

Longitudinal frictions and traction of the fingers are used against "attaques des nerfs," "etouffements spasmodiques," &c.

Manipulations as well as frictions are mentioned in modern systematic works on therapeutics. The success obtained by the late Mr. HARRUP at Brighton, Mr. BEVERIDGE in Edinburgh, Mr. R. HUTTON, of Crawford Street, London, &c., is owing to the curative effects of the above means. In

almost every country there are persons who have obtained repute by dealing with dislocated joints, sprains, &c.

Dr. BALFOUR (see p. 45), in reference to this subject, says: "Did surgeons in cases of luxations and sprains apply frictions, percussions, and bandages from the beginning, according to circumstances, promoting at the same time the natural motion of the part, the celebrity of bone-setters would be heard of no more."

22. Dr. PERRY of Paris,* having himself for a considerable time been a sufferer in consequence of a severe sprain of the ankle, and being cured by a "rebouteur" (bone-setter) in a very short time, compares the rapid influence of these mechanical proceedings with the effects of certain specific medicines, and thus describes the former: "The cure of sprains by the means used by bone-setters is composed of two essential elements,—pressure upon the main nerves and veins connected with the diseased articulation, and certain movements applied to the joint itself. The pressure upon the nerves causes a cessation of the morbid sensibility, and the exercise restores the normal pliability and the functions of the articulation."

23. Dr. CALLAWAY, in a dissertation† upon dislocation of the clavicle and shoulder-joint, says: "In dislocation of the tendon of the long head of the biceps muscle, I should elevate the shoulder and direct the patient to bend and extend the fore-arm, at the same time rotating the humerus. At the end of a fortnight I should recommend passive motions, so as to enable the parts to adapt themselves to their new positions," &c.

* "Journal de la Médicine Homœopathique." Paris, Février 1848.

† TH. CALLAWAY, "A Dissertation upon Dislocation and Fractures of the Clavicular and Shoulder Joint: being the Jacobsonian Prize Essay for 1846." ("The Lancet," Oct. 13, 1849.)

24. Dr. SMYTH* having, as he says, long entertained an opinion that persons afflicted with pulmonary complaints would derive considerable benefit from the motion of swinging, had made an application to the Governors of Middlesex Hospital (London), who ordered a swing to be put up in the garden belonging to the charity, and had thereby an opportunity of trying its effects in 14 cases of hectic fever. The results even exceeded his expectations. In many of these cases the effect on the pulse was most marked: in one, the pulsations per minute were 14 less, after the patient had been 10—15 minutes in the swing. In several cases where the pulse was 130 to 140 per minute, it was gradually reduced to a normal rate. In summing up, he observes, respecting "the power of passive motion on the body, that the motion of swinging has often a very sensible and immediate operation on the heart and lungs; as it reduces the frequency of the pulse, lessens febrile heat, suspends or prevents coughing, and promotes perspiration."

On contrasting the effects of sailing and swinging with those of active exercise, he observes, that "whilst the latter increases the heat of the body and frequency of the pulse, the swinging motion lessens both. Exercise frequently excites coughing; the passive motion as frequently prevents or removes it. Exercise, when violent or too long continued, occasions sweating, fatigue, and languor. Passive motion invigorates even the most weakly; it produces costiveness and sleep:—in short, active exercise acts as a stimulus, passive motion as a sedative on the system." In comparing the effects of swinging with those of sailing, he observes that "both act principally through the balancing motion, and that swinging is applicable in any stage of the disease or degree of weakness, and can be used even in the patient's

* J. CARMICHAEL SMYTH, "An Account of the Effects of Swinging employed as a Remedy in Pulmonary Consumption and Hectic Fever." London, 1787.

bedchamber; and finally, that it may probably be employed with advantage in a variety of other cases."

This is a form of exercise in which LING and his followers had had no experience, no trial of it having been made. In 1870, however, the writer made Dr. LIEDBECK acquainted with the experiments of Dr. SMYTH, of swinging in consumption. The case in which it was then tried was unfortunately hopeless from the beginning, and no results were obtained. Lately, the writer has recommended swinging in a case of phthisis with profuse night perspirations, œdema pedum, pulse 120, &c., with the result that the pulse after 15 minutes' swinging went down to 105, and after a repetition in the afternoon of the same day of 15 to 20 minutes' swinging, the pulse decreased to 78. The following day the effects on the pulse were less striking, but other hectic symptoms were generally ameliorated. However, even in this case the effect unfortunately gradually ceased. The so-called "American swing," which is well adapted for the purpose, has been used, and seems to be an instrument which ought to have a place in a Gymnastic establishment instituted for curative purposes. The question of its usefulness in phthisis would thus soon be decided.

25. Sir JOHN SINCLAIR,* in his remarkable book on longevity, reminds us that ASCLEPIADES in sleeplessness "recommended the plan of pensile or suspended beds, by which the patient was rocked to sleep." He further says: "The celebrated canal engineer, BRINDLEY, often saw the experiment tried, of a man extending himself across the large stone of a corn-mill, and gradually falling asleep by the stone whirling round, before it had gained its full velocity." Some contrivance of either or both of these methods might make the use of the usual pharmaceutical soporifics superfluous for many sufferers. The writer remembers having seen at the

* "The Code of Health and Longevity." By Sir JOHN SINCLAIR, Bart. Edinburgh, 1807. Second Edition. Vol. I. p. 598.

Salpetrière Hospital in Paris, in 1847, a kind of machine in which the patient was placed horizontally and whirled round; but the plan had from some cause been discarded. The experiments (Poggendorff annalen) on guinea-pigs, which by a violent horizontal centrifugal rotation were killed, when placed with the head in the periphery, by congestion of the brain, and when placed with the head in the centre, by the blood being forced from the brain, belong to this category.

Prof. BRANTING in cases of vertigo has introduced a somewhat similar but milder form of action, by making use of a quick turning of the head from one side to the other, with a short pause at each turning, in either a standing, sitting, or reclining position. The passive form of the so-called head-rotation has also proved useful in some cases of vertigo. The so-called ringing or pendular motion with the upper part of the body, the legs being fixed, seldom fails in producing sleep. ("Kinésithérapie," p. 103.)

In a letter by a Swedish gentleman, Baron EDELCRANTZ, which is among the many communications to Sir JOHN SINCLAIR on the subject of health and longevity, it is recommended to use deep inspirations in order to avoid the evil consequences of *emotions of the mind*, as sudden grief, anger, or fright. "The first effect of this cause," he says, "as of everything which forcibly fixes attention, is a complete interruption of the respiration, which I have found by experience may be prevented by the voluntary exertion of a *forced inhalation* three or four times." The letter is in itself full of excellent remarks, giving evidence of an acute and observing mind. So the Baron remarks: "I think the dietetical rules may, in some future period, be directed even to the formation of the moral habitudes of men, rendering them more useful to society, and giving a longevity measured by *actions* instead of a longevity calculated by *years*."*

* "Letter from the Chevalier Edelcrantz of Sweden to Sir John Sinclair, on the subjects of Health and Longevity." *Op. cit.*, Vol. II. p.

As to the question of longevity, cases are mentioned in Sir John's book of fencing masters having continued robust and active in their profession to a great age (among whom the father of Mr. HENRY ANGELO, active within a few months before his death at 85; Monsieur MOLLARD, about 80, &c.). Whilst on this subject, the writer remembers having seen at the Cirque Olympique, Champs Elysées, in Paris, about 1848, the French clown, Mr. AURIOLE, at the age of 68, perform all the evolutions of his craft with much elegance and suppleness, like a young man. He also remembers a Mr. GAUTIER, at Stockholm, in about 1845, who at his benefit as the head of a travelling circus, made a somersault, dressed in his usual riding costume, with top-boots and spurs, at the age of 65 years. He was on the occasion surrounded by his 12 sons, all fine grown-up men. Mr. G. died some years ago in Sweden, at the age of 90, as a hale old man.

26. The case of the cure of a cataract in Admiral HENRY is thus reported in the "Medical Guide:" †

"The following remarkable case of the gradual disappearance of a cataract is an evident proof that the absorbent vessels of the part are equal to the removal of a diseased lens.

"Admiral HENRY, being afflicted with cataract in both eyes, consulted Mr. WARE, who recommended extraction. The admiral agreed to the operation on one eye, and in case

7—28. This letter has had a special interest for the writer, who in Chevalier, afterwards Baron EDELCRANTZ, recognised a distant relation, whom he used to visit as a child. Having lived for some years in England, the Baron had had a house built for himself after the English fashion, and had introduced English games, among which one called "the trucco" was very entertaining. He also introduced steam-power, telegraphy, &c., into Sweden; was the founder of the Royal Academy of Agriculture, &c.; in fact, was a man of great genius, and of great use to his country.

† Extract from the "Medical Guide," by RICH. REISE, M.D. P. 229, art. Cataract.

it answered, he promised to allow him to operate on the other. Unfortunately, however, he was not in the least benefited by it, for so much inflammation and thickening of the cornea succeeded, as entirely to destroy vision. The admiral having cured himself of many obstinate attacks of rheumatism and gout, by friction, and by rubbing the part with a piece of wood, resolved to make the same experiment on the eye affected with the cataract. After rubbing the eye, and at times beating it with a small wooden hammer (the eyelids being closed), in a few weeks he found that he could discern a luminous body, and continuing the practice, the diseased lens was so totally absorbed that the gallant admiral was enabled to read small print!" *

27. Dr. WALTER of Munich, in his "Augenheilkunde," published 1849, has the following statement, which bears upon the question of obtaining absorptive action by applying passive movements to the region of the eye: "I have succeeded," he says, "by applying pressures to the region of the eyes, thirty or forty times a day, in dispersing opacity of the cornea. That this complaint, which, when occupying a larger surface, was hitherto considered as withstanding every method of cure, should yield to these means, is not to be

* In a pamphlet published on the subject, the account, though somewhat differently given, is in the main, as to the cure of the cataract, correct. "An Account of the means by which Admiral HENRY, of Rovelden in Kent, has cured rheumatism and tendency to gout, tic-douloureux, cramp, and other disorders. and by which a cataract in the eye was removed." London, 1816. By a curious coincidence, the writer had an opportunity, in the commencement of his practice in London, of ascertaining the veracity of this interesting case. The Rev. Mr. H., whilst under the kinetic treatment (the case of Admiral HENRY having been mentioned to him with some expressed doubt), at once, of his own accord, observed: "I know perfectly well the particulars of the case. I have heard it mentioned many a time by relations of my wife, who were all connected with the old admiral."

wondered at, if we consider that opacity of the cornea consists principally of cicatrices." The writer has had a case of contracted fingers from burns, which was cured in six weeks by kinetic manipulations. The late Dr. NEUMANN of Prussia mentions, in CASPER'S "Wochenschrift," a somewhat similar case.

"The following story is told by the 'Lincolnshire Chronicle.' We give the exact words of the paragraph in our contemporary, as the value of the tale arises mainly from the authority for the facts, and the circumstantiality of the account: 'Mrs. Wilkinson, of Eynesbury, near St. Neot's, completely lost her sight twenty-five years ago, notwithstanding the best medical aid. About six months back she accidentally fell down stairs. Fortunately she sustained no injury from the fall, but the shock occasioned by it seems to have led to the recovery of her sight. A day or two after the accident occurred Mrs. Wilkinson fancied she could see a little, and so intimated to her husband. At first he was naturally enough inclined to doubt the fact; but her sight daily grew better, and she is now enabled to distinguish colours and to see pretty well. The joy of Mrs. Wilkinson and different members of her family may be well imagined. A son, twenty-three years old, she has just been able to look upon for the first time."*

Supposing this account to be true, the effect of the fall can only be explained by the disturbance thus produced having in some way acted on the cerebral centres, notably on the thalami nervorum opticorum, the optic nerve, &c. In order to try the effect of succussions and commotions in cerebro-spinal affections generally, it would not be difficult to imagine the construction of a mechanism by the means of which succussions might be regulated to a great nicety, say from 3 to 5 centim. to $\frac{1}{4}$ metre. An instance of the effect of

* "The Leader," June 4, 1853; also "The Examiner" of the same date.

such commotions is mentioned, p. 28. In the English translation of the works of HIPPOCRATES, there is a figure representing a machine of a primitive construction, intended to produce succussions as a means of cure in spinal deformities. (Vol. II. fig. 6.)

28. Mr. PUGH,* an anatomist of the latter part of the last century, is the first who mentions and advocates special muscular movements; and he considered himself in this to have made a lucky discovery. In his book, where we look in vain for any description of these movements, it is mentioned that they were recommended by eminent physicians of that time (J. HUNTER, BAKER, &c.). Contractions of joints, paralytic weakness of the extremities, are a few out of the many cases he refers to, with testimonials of their cures.

29. Mr. GROSVENOR, an eminent surgeon of Oxford, had rendered himself about the same time justly celebrated throughout the kingdom, by the application of friction to lameness and imperfections of motion arising from stiff and diseased joints. According to Mr. CLEOBUREY,† who had adopted the method of Mr. GROSVENOR, "frictions are indicated in contractions of joints, when there is too great secretion of synovial fluid in the joints, after wounds in ligaments, in paralysis, in chorea, in violent strains of the joints, in incipient cases of white swellings, in various cases of dislocation of the joints in weakly and ricketty children, in most cases where the circulation is languid," &c. "In Mr. GROSVENOR'S method," the author says: "The frictions were applied principally with the palms of the hand, taking

* JOHN PUGH, "A Treatise on the Science of Muscular Action." London, 1794.

† CLEOBUREY, "A full Account of the System of Friction in Cases of Contracted Joints, Lameness," &c. By the late eminent Surgeon, JOHN GROSVENOR of Oxford. Oxford, 1825. Third Edition.

long strokes, one hand ascending as the other descends, keeping both hands in motion the whole time," &c. The friction was at first continued for one hour daily, and gradually increased till the patient could bear to be rubbed an hour at a time, three times a day (observing always to rub by the watch). After every period of rubbing, however unpleasant and distressing it was to his patient, he invariably obliged him to put the limb to the ground and make efforts to walk, &c. From these attempts, repeated after every rubbing, the genial warmth produced by the friction enabled the patient to do something more towards walking every day; and innumerable instances have been known of persons *perfectly lame*, and using crutches, throwing them aside in a fortnight or three weeks, when the friction was suited to the disorder," &c.

These interesting observations on friction furnish the writer with an opportunity of making a few remarks on this form of movement.

In the first instance, it may be observed that no type of passive motion has been so much the object of medical thought, and so often handled in medical dissertations, as frictions. Frictions differ principally in point of strength and direction. In order to give a simple and easily understood example on the confusion that exists in relation to Kinetic quantity in general, the following statement will suffice. Under the name *friction*, stroking, rubbing, &c., is understood, as well an operation made with the greatest possible effort, as one with the most subtle and gentle attouchement (*effleurage*). Kinesiatrics is destitute of the precisely graduated terminology which the preparations of the chemist possess in definite weights and measures.

In the writer's private practice, an imperfect attempt has been made to determine the movement-quantity, as a help for the assistants, by adopting seven degrees of strength for frictions, &c. This requires, however, for each organ or

group of tissues a special and characteristic *Key*, which cannot here be described. In point of direction, LING accepts three forms of friction :

(*a*) *On* or *round* the abnormally affected part (generally circular or arcuated). (*b*) In a direction *from* the diseased organ ; or, (*c*) In a direction *towards* the affected part. In the two latter respects, the relation to the valves of the veins has been considered of importance.* Besides, friction is generally rousing and stimulating in proportion to its quickness, and calming and soothing in proportion to its slowness.

Without entering on any description of the *modus operandi*, the writer enumerates here the essential forms of friction hitherto used in the Kinetic practice, and in the terminology and sign (=) adopted by Professor BRANTING :—

1. Longitudinal and transversal scalp = (along the cerebral sinuses).
2. Supra-orbital =.
3. Infra-orbital =.
4. Ciliary =.
5. Temporal =.
6. Antero-posterior ear =.
7. Sub-occipital =.
8. Sub-maxillary =.
9. Lateral neck =.
10. Laryngeo-tracheal =.
11. Chest-lift = (recline, lean sitting position).
12. Loin-lift = (position as in No. 11).
13. Spinal =.
14. Bi-lateral spinal =.
15. Divergent spinal =.
16. Transversal lumbar =.
17. Sacral =.
18. Gluteal =.
19. Gluteo-femoral =.
20. Sciatic-nerve =.
21. Transversal abdominal =.
22. Hypochondriacal =.
23. Colon =.
24. Concentric abdominal =.
25. Inguinal =.
26. Inguino-crural =.
27. Baseo-scapular =.
28. Brachial gripe =.
29. Palmar =.
30. Femoral gripe =.
31. Circular = (above and below the various joints, &c.).
32. Supra et infra malleolar =.
33. Plantar =, &c.

* See LING's "Gen. Princip. of Gymn.," 2nd edit., p. 583.

For these frictions the following positions are used:— No. 1—7 are made in a sitting posture; No. 8—10, 27—33, both in standing or in a sitting position; No. 11, 12, 25, 26, in recline-leaning position; No. 13—15, opposite standing; No. 16—20, standing position; No. 21, lying or standing, with the arms extended and fixed above the head; No. 22, 23, in lying or crook-reclining position; No. 24, in crook-reclining position, &c. It would require a book of another aim and character than the present one, to describe the different parts of the hand and fingers which are used in these manipulations.

In connection with the above short account of frictions, it might be mentioned that to the Gymnastic store of this class of movements belong also some of a half-active character. Such are the stretched sitting, linear spinal friction (with resistance), with arms-bending; also the hand-friction, which is effected by laying tightly hold of a somewhat thick rope, and rubbing the hands sharply along it, &c.

30. Dr. BALFOUR* had already, in 1819, employed and adapted compression and percussion in the treatment of rheumatism, gout and debility of the extremities, spasms, &c. His book contains upwards of thirty different cases, in which cure or considerable amelioration was thus effected. Claiming the honour of having discovered and introduced into practice the power of percussion, he thus concludes: "But percussion is not confined to rheumatic affections alone; it is applicable, with the best of effects, to many other complaints that occur every day. It is capable of removing, in a very short time, that general distress and uneasiness arising from an unequal distribution of the fluids, occasioned by cold and fatigue

* W. BALFOUR, M.D., "Illustrations of the Power of Percussion and Compression in the Cure of Gout and Debility of the Extremities, and in Prolonging Health and Longevity." Edinburgh, 1819.

combined. It removes pain from the stomach—it cures heartburn—it promotes digestion, and finally, it conduces to health by promoting the action of every organ; and the time is not distant, I trust, when percussion will be acknowledged as a power, in all cases equal, and in many, superior to electricity." Percussion, in its various forms, is one of the passive movements used in LING'S system, at least since the beginning of 1813, and has in a great variety of therapeutic applications justified the high praise of its English reinventor.

Certain forms of percussion are characterised by their acting on deep-seated internal organs. The principal, and the forms most used in LING'S Kinetic treatment, are the following:—

(*a*) The *pugnal percussion*, used on the lumbar and sacral region, is generally applied with the fist, with a certain degree of force corresponding to the massive covering through which it is intended to act.

(*b*) The *palmar percussion*, applied with the palm of the hand, mostly on the thoracic walls, in order to act on the lungs or the heart. Besides this, on the extremities, and it is in this application adapted in the s. c. massage.

(*c*) The *ulnar percussion*, applied with the ulnar edge of the hand, used principally along the spine or in a divergent direction on the thorax, on the extremities, and also, in a modified form, more resembling the form (*d*), to various regions of the head.

(*d*) *Digital percussion*, in which either the palmar surface of the fingers is used, or else the tips of the fingers, closed or open, employed principally on the head and its coverings, &c., where a more modified degree of force is desirable.

(*e*) In order to act on larger nervous trunks, percussions have been applied with a small ivory hammer, as, for instance, *the sciatic nerve percussion;* or on the soles of the feet, with half-an-inch thick short staff, in *plantar percussion*, &c.

31. Dr. GOWER,* describing an instrument called *the pulsator*, for the percussion of various parts of the body, says: "It has been an established practice, traceable from a period as ancient as that of HIPPOCRATES, to give aid to such parts of the human body as are enfeebled or under suffering, by mechanically propelling the languid circulation of the fluids." †

32. Dr. SARLANDIÈRE ‡ recommends the use of muscular percussion in rheumatic pains. He observes that continual slight percussion decreased the temperature of the parts thus exposed. This method, as well as the massage, is mentioned in the treatise on Therapeutics by Trousseau and Pidou.

33. Dr. FENWICK has made mention of a rather interesting application of percussion on the sacrum (sacral percussion). A patient, a blacksmith, of nervous temperament, consulted him for symptoms of stone. On passing the sound, he felt the instrument grating on something lying behind the prostate. He placed the patient on two chairs, face downwards, and succeeded in dislodging the stone by striking him smartly upon the sacrum with the hand. §

34. Dr. GRIMSHAW (letter to "The Lancet," Dec., 1869) has the following notice, well worth preserving among these

* C. GOWER, M.D., "Auxiliaries to Medicines." In four Tracts. London, 1819.

† A large wooden hammer, called "the Swedish hammer," was shown the writer, in London, some years ago, to be used in percussion. It was, in truth, more like the formidable *hammer of Thor* than a healing instrument. A specimen of this hammer has been presented to, and is at present in the collection of instruments at the Gymnastic Institution of Stockholm.

‡ SARLANDIÈRE, "Traité du Système Nerveux." Paris, 1840.

§ Dr. FENWICK, "On Lithotrity," "Med. Times and Gazette," June 17, 1854.

records: "It may be interesting to your readers," he says, "to know that continuous tapping (if tapping can be called continuous) is a traditional remedy, in some parts of England, 'for rheumatic pains.' I have heard of this remedy being employed in the Eastern Counties, and I think also in Kent. I have known success attend this method of using vibratory motion."

35. Dr. CARELL, physician to the Emperor of Russia, gives his full approval to Mr. C. KLEMM'S* plan of using percussions with elastic staves of different lengths, applied by the patient himself as "home treatment," for "all the ills that flesh is heir to." This brings to mind a plan of treatment *en vogue* in the South of France some thirty years ago, under the curious name of tapotopaty.

The use of a short staff as a gymnastic implement dates since the beginning of Lingism; as also mentioned by Dr. NEUMANN, "Heilgymnastic," 1852, p. 215, 277.

36. Dr. WOLFFSHEIM of Brunswick has the following interesting case: "I had the opportunity," he says, "to observe the extraordinary effects of friction, gentle pressure, and kneading, in a case of constipation of long standing. A man, 84 years old, suffered from constipation, for which I had in vain prescribed the strongest medicines. His complaint had already lasted eight days, and the symptoms were: abdomen much distended; constant nausea; weak, soft pulse, and great prostration of strength. All these symptoms disappeared in a few hours, the bowels being moved by the application of slight pressures and frictions on the abdomen, and the patient was thus saved." †

37. It is the common practice amongst the nurses in

* "Die Muskelklopfung zur Active-Passiv Zimmergymnastik für Kranke und Gesunde," von C. KLEMM. Riga, 1877.

† CASPER'S "Wochenschrift," Nov. 26, 1847.

England when babies are crying from colic pains, flatus, &c., to place them on the stomach and to gently tap them on the lumbar, dorsal or sacral regions. Frictions along the spine in the above position often calm and quiet them. A lady, who had brought up a large family, told the writer that the old nurses in the country are in the habit of making frictions along the spine and the palm of the left hand simultaneously against spasms and fits of violent screaming, &c. In cases of constipation in new-born children a mechanical remedy is made use of in order to produce action of the bowels. A small piece of paper is rolled together, and having been dipped in some oil, it is introduced into the anus; when taken away the operation generally immediately follows. Irritation of the fauces in order to produce vomiting needs only to be mentioned here.

38. Mr. ANDERSON reports a case in the *Lancet** of protracted constipation in a child three years and a half old. There had been no relief of the bowels from the 21st April to the 21st June, 1854, when it was brought to the hospital by the mother, who stated that the child had often been constipated from a fortnight to a month, but never so long as at present. The strongest aperients, enemata, &c., had been used. At last, an examination per anum having been made, "a hard globular mass was felt distending the whole of the rectum. The sphincter was dilated gradually, the mass broken down and removed by means of a spoon and the forefinger, *pressure and friction were then applied to the abdomen*, when the pent-up bowels began to act immediately."

39. Dr. J. W. F. BLUNDELL proposes in spasmodic

* Protracted Constipation, *The Lancet*, March 10, 1855. Six to seven weeks' habitual constipation have occurred in the writer's Kinetic practice with curative results.

stricture of the bowels the use of "a vibratory or stimulating application to the sphincter ani with a blunt wooden instrument." "It will be found," Dr. B. says, "to relieve the severe bearing down and other pains when the bowels have been long confined. The point of the instrument should be placed on the front margin of the sphincter at its junction with the perineum."*

40. Dr. CASIMIR BROUSSAIS,† as physician at the Gymnase Normale Militaire et Civile in Paris, published 1827, his experience on Gymnastics in a small pamphlet. He enumerates the resources which it would afford to the healer—(*a*) In directing and supporting health; (*b*) In correcting deviations of the spinal column; (*c*) In curing some diseases; and (*d*) In accelerating in some cases the course of convalescence. Some cases of cure of deviation of the spine are interesting as being produced by general Gymnastics; a proof that the teacher had been attentive to the correctness of the positions; even in our days a rare occurrence.

Taking into consideration the time when this was written, Dr. BROUSSAIS'S words are remarkable. It is certain that, in reference to slight and commencing deviations of the spine, stooping habit, contracted chest, &c., later experience has confirmed Dr. B.'s opinion. There are medical men of merit who still doubt the veracity of any assertion as to the cure of spinal deviations, whatever kind of treatment may have been applied, whether medical gymnastics, orthopædic treatment, electricity, &c. It is with spinal deformities, as with many other affections, they have a curable and an incurable stage. It is, however, sufficiently evident that if the method is characterised by a proper selection as regards physiological

* "Spasmodic Stricture of the Bowels," &c., *Med. Times and Gazette*, June 23, 1855.

† "De la Gymnastique, considerée comme moyen Thérapeutique et Hygiénique." Par CASIMIR BROUSSAIS, M.D. Paris, 1827.

action, by ocular simplicity, and by a regularity in form (correctness), an intelligent and attentive lady-teacher can ameliorate a great number of slighter deformities by the employment of the usual repertory of exercises belonging to educational gymnastics, without having recourse to the more localised forms of movements which characterise the medical gymnastics.

This the writer has seen confirmed as a general result of educational gymnastics with the majority of young girls ever since 1844, when it was introduced into the school of a Miss SJÖBERG at Stockholm, under the writer's superintendence and the able teaching of the Misses LING and LEMON. Such a result attendant on the accurate teaching of pedagogic gymnastics has been further confirmed by some of the present lady-teachers at the Central Institution at Stockholm; as well as by the writer, in the classes at his late Gymnasium in Wimpole Street, London; and also at the classes at one of the schools at Highgate, under the able management of one of the writer's assistants, at that period, Miss ELIZA PARTRIDGE, where at the same time a marked improvement was observed in the general bearing, chest development, and health of the pupils. It has unfortunately, however, been also observed in Sweden that slight deviations of the spine have increased to real deformities under the use of pedagogic gymnastics through incapacity in the teacher; a proof that the best method can be neutralised and rendered worthless in its effects; and that theoretical incompetence does not prevent gymnastic teachers from committing grave errors in their practical teaching. Still more, from the writer's experience whilst an officer in the Swedish army from 1830 to 1846, is he able to testify that the quantity (register) of free exercises which is contained in the "Reglement" of Gymnastics for the Swedish Army, of 1836, chap. 1, 2, & 6, and tables 1—10, is, as regards selection of movements, so simple and concise that the same, supplemented by a few equally

simple and concise "*exercises enginaires*" (climbing, vaulting, balancing), could practically be taught to, and employed by, any intelligent drilling master, even if he were destitute of any scientific knowledge, and may be used by such persons without any single case of injury occurring as a consequence of the exercises.* During the above period (1830—46), and the general introduction of Gymnastics in the Swedish army, not a single case of injury or accident occurred; but later on—after incomplete, not to say faulty rules, supplied in a compendium, 1848, of the above reglement—several complaints have been made and published in the statistical report of the Board of Health of 1861.

41. Dr. RECLAM, of Leipzig, mentions, at the Congress of Physicians at Vienna in 1859, the great influence of move-

* This presupposes, however, a complete and well organised system of inspection and supervision by persons well versed in the theory and practice of scientific gymnastics; who know not only its aims in general, but also what result might be expected as to the development and training of the pupils. Only through a real scientific foundation can a method be produced which contains all the conditions requisite to make it possible to confide its practical execution to the mere routine of a number of drilling masters, and then only provided they are under sufficient control. It cannot be denied that Prussia, by persevering efforts on the part of the celebrated General von Roon and the devoted Major Hg. Rothstein, was in 1860 the first country which in some measure succeeded in introducing in a large army, gymnastic drill schools, which combined sufficient simplicity, correctness and careful attention, along with a certain degree of completeness as regards *repertoire*, or store of exercises (see Rothstein, Die Königl. Centralturnanstalt zu Berlin, 1862; also Stocken, Beiheft zu Militairwochenblatt, 1869, and H. Kaiser, Das Rothsteinische System, 1861. Compare also Die Instruction f. d. Truppen, 1860). The obstacles to the introduction of Gymnastics in *whole armies*, at the commencement of this century, was due not only to indifference and routine in the military profession, but also to the want of simplicity, selection, and positivism in the gymnastic methods.

ments of the trunk, viz., on the circulation, perspiration, and the fœcal matters.*

This observation claims an acknowledgment. To the writer's knowledge, Dr. R. is the only physician who, though unacquainted with the prevailing character of the Swedish method in developing the movements of the trunk in order to produce different actions in the various internal organs, had perceived the virtue of this form of exercise, which contains the most essential types for producing specific actions by means of *active* movements. The collection of written prescriptions by Professor BRANTING, which are deposited at the library of the Central Gymnastic Institution of Stockholm, 1828 to 1845 (about 30 vols.), show the following principle. With a few exceptions, and these generally in the commencement of a treatment, the most varied and often prevailing form of types of movements belong to the trunk. They have, at times, been designated as *respiratory movements* (BRANTING), though not in the usual acceptation of the term. Of course, in some local affections of the extremities, &c., movements of the trunk become quite secondary. In the writer's practice the trunk movements constitute an average of from one-third to one-fifth of the whole number, which generally varies from nine to fourteen movements.

42. The effects of compression are more generally known in surgical practice, in producing absorption in cases of œdema, swelling of glands, &c.† Mr. ISAAC BROWN'S ‡ remarks on the treatment of ovarian dropsy by pressure, are facts which need only here be alluded to as proving the absorptive effects of compression, &c.

* "La Gazette Hebdomadaire de Méd. et de Chir." Oct. 10th, 1856.

† "Dictionnaire des Sciences Médicales, l'Art. Compression."

‡ "On Ovarian Dropsy treated by Pressure," &c. By J. BROWN. (*The Lancet*, July 7th, 1849).

43. Compression (tight binding) of the abdomen has been recommended for spasmodic cough;* also binding round the articulations in asthma millari.†

44. Dr. EISENMANN, in *Casper's Weekly Journal*, gives some interesting observations on the curative effects of the application of pressure to burns,‡ saying that "it produces all that you can expect from any curative method."

45. Dr. DUTROS§ has some observations of great interest upon the effects of the compression of nerves in general, and especially of the facial nerves, from which the following is extracted:—(*a*) The most intense tic-doloureux, hemicrania, are removed, often instantaneously, by compression of the facial nerve between the angle of the inferior jaw-bone and the mastoid process. (*b*) Pains in the occiput are alleviated by pressure applied to the neck, in the chink formed by the splenius and complexus muscles, as also pains between the shoulder-blades.‖ (*c*) Pains in a decayed tooth are removed by pressure of the part of the gums whence a tooth has been extracted; and compression of a painless tooth, not decayed, sometimes alleviates the pain in another. (*d*) Fits of syncope, eclampsia, epilepsy, and hysterics are often suppressed by pressure on the facial nerve.

° OESTER, "Wochenschrift." (Nenste folge), 3 v., p. 557—59.

† OESTER, "Wochenschrift." (Nenste folge), B. II.

‡ CASPER'S "Wochenschrift." Dec. 1846.

§ "Compte-rendu Hebdomadaire de l'Academie des Sciences. Paris, Juillet 1843.

‖ A pressure applied under the lower angle of the scapula is the old and mostly used *modus operandi* in the case of pains under or between the scapulæ. This effective movement (subscapular pressure) is unfortunately one of the many which lately have, as far as the writer knows, disappeared from the Ling-Branting *materia gymnastica*, except in Branting's and the writer's practice.

46. Dr. NELATON* recommends compression as a means of reduction of hernia.

47. Dr. PARRY, as long ago as 1785,† details facts proving that by intercepting the flow of blood to the brain by compression of the carotid arteries, excessive sensibility with regard to external impressions, headache, vertigo, spasmodic dyspnœa, hiccup, general convulsions, and delirium might be for a while wholly removed or greatly mitigated.

In sleeplessness brought on by excessive bodily or mental exertion, anxiety, late hours, hot rooms, &c., with cold feet and the pulse in the carotid arteries prematurely strong, "sleep has been induced by lying on one side, and making with the thumb a firm compression on one carotid artery."‡

Noise in the ears of different kinds and degrees, when affecting one ear only, "I have often," says the same acute observer, "been able *pro tempore* entirely to remove, and always to alleviate, by compressing the carotid artery on that side." "Headaches from dyspepsia, disordered peristaltic action, with flushing of the face and strong pulsation in the carotid, facial, or temporal arteries, are relieved by strong pressure on the carotids, which also increase the warmth of the lower extremities and cause a glow in the stomach and bowels." In epilepsy, hysteria, hypochondriasis, in cases of insanity and hysterical mania, "these have often been removed by compression of one or both of these arteries." In a violent case of catalepsy, pressure on both carotids uniformly suspended the symptoms and restored the patient's senses; pressure on one carotid had no effect—if not effective it produced convulsions, while a greater degree removed the convulsions also."

* "Medical Times and Gazette," Jan. 23, 1858.

† "Memoirs of the Medical Society of London," Vol. III. p. 77.

‡ "Elements of Pathology and Therapeutics," &c. By CALEB HILLIER PARRY, M.D. 1815.

48. "In a boy a fit of spasmodic asthma was suspended by a violent concussion of the brain, and returned as soon as the immediate effects of the concussion ceased."*

49. In FLEMMING'S experiments on carotid compression, he observes that in healthy persons they produce sleep and lively dreams.

50. Dr. HARTWIG† has written on walking as a method of curing disease. The celebrated physiologists, the two brothers WEBER, have proved that walking is a characteristic type among the movements that belong to man. No type has been the object of so much deep research. Even recognising the important observations which have been made on the subject, it must be acknowledged that the most essential points still remain shrouded in obscurity; thus evidencing the great complexity of the motorial apparatus in the human body. Of all the later writers on the subject, MAISSIAT is the only one who has added anything of importance. Moreover, since the beginning of the century, this type has been the object of diametrically opposite theories and convictions among writers on Gymnastics. Some have considered it as the most simple exercise, especially suitable for beginners. The followers of the so-called Swedish method consider it as one of the most complicated exercises, which seems to coincide with the views of physiologists on the subject.‡ Besides it must not be forgotten that this undoubtedly important type of exercise has during centuries been looked upon as representing the modern Gymnastics in a preventive and a curative point of view; it has in fact been *the* exercise

* PARRY, op. cit., p. 393.

† Dr. HARTWIG. "Die peripatetische Heilmethode, oder die Bewegungs-cur." Düsseldorf, 1847.

‡ P. H. LING. "General Principles of Gymnastics." 2nd Part, 8 mom., and 3rd Part, 2 mom.

among poor and rich, high and low.* And here the gentle communicated motion to internal organs by each step in walking must not be overlooked. Lastly, the following remarks may be appended.

Gentle walking about the room was from the very first recommended and enforced by LING, to be practised *between the localised and systematised* movements employed in the medico-gymnastic treatment. Pauses are necessary, it may be remarked, in order to give time for the action and reaction of each separate movement.† The importance of this rule has lately been more or less overlooked; in truth, gentle walking is really in this sense an "apotherapeutic" exercise. There is hardly a groom who does not know that he must lead his horse about for some time after a gallop.

The old rule that exercise should be taken on an empty stomach, though generally true, is however open to exceptions in so far, that flexions and extensions of the arms and legs, without locomotion or too quick a rhythm, may be used with impunity; but not so, strong movements of the trunk, or running exercise, which by increasing the respiratory movements of the diaphragm, produce a pressure on the expanded ventricle of the stomach. This, among other things, shows a specific character in movements.

It might here be observed that a mistake is often made as to what is really a specific difference in exercise. It has sometimes been advised that young ladies should only use free exercise, with the exclusion of all "*exercises enginaires*" as being too violent for the delicate sex. A rythmical alter-

* As it is the question here of walking exercise as the universal representative of Gymnastics, the writer would, as an antithesis, refer to the following observation of Dr. BOUCHARDAT (de la Glucosurie, &c., Paris, 1875), in consequence of the effects of exercises in glycosuria: "Depuis longtemps je prescris *l'éxercise modéré des bras* comme un des moyens les plus sûrs d'éviter la vieillesse prématurée."

† Some very weak patients must rest during these pauses.

nate knee-upbending ("*pas gymnastique*" or "*pas de course*") at the rate of one hundred and fifty steps in the minute or more (a free exercise), is the exercise which has tended most frequently to cause over-exertion and its other consequences—palpitation, headaches, faintings, &c.; whilst many a rational exercise with the aid of an apparatus is in reality much less fatiguing if correctly done (see HARTELII, *Periodical for Gymnastics*, p. 329). The writer has mentioned the above case only as an example among several others of the same nature. This confusion of forms and things is, with few exceptions, general among teachers and instructors in educational gymnastics, and is often found in manuals on Gymnastics. It has even happened, in countries where gymnastics are obligatory, that physicians commit somewhat similar errors in giving certificates either of a total exemption from all gymnastic lessons, or only partially from certain kinds of exercises, without distinguishing the apparently violent from the really innocuous.

In consequence of a wrong idea about Gymnastics as a whole (as in the case above mentioned), we find that Gymnastics, limited to only free exercises, often take the exclusive form of dancing, developed in a numberless variety of forms. Confusions of this nature will never end until the decision as to the kind of exercises ceases to be deduced from the *possibilities* which the different kinds of Gymnastic apparatus may suggest. This will continue as long as the exercises are employed from only *mechanical* considerations, as for instance, from the *apparata* ("*engins*"), or from only the *articulations*, or from only the *muscles*, &c., because then several important types of movements, with their corresponding important effects, become excluded, and consequently an immense quantity of mechanical possibilities, of no physiological value, become adopted.*

* See the numerous examples of anomalies of this kind in the so-called "Laspéisme," which has had several degrees of development of the all-

Then also the fundamental law of physiological integrity is overlooked. *This law demands that the movements be classified and practically used in perfect accordance with their different physiological effects in reference to "vessel and nerve"* (BRANTING); the only correct and integral plan which decides what movement belongs to Gymnastics or not. If the idea of Gymnastics is correctly conceived and carried into practice, the boundaries of "free exercises" and gymnastics with the aid of apparata (*exercises enginaires*) are in many respects, as to effects, only apparent.*

The aims and limits of this pamphlet do not permit the writer to enter more fully into these questions, which however rest on a just idea of the expressions, specific active or specific passive movements, expressions which the writer adopted in 1847 in the sketch he published, in Paris, about LING'S System; in a narrower sense meant to convey the idea of strict localisation and action, in the Kinetic treatment, on certain tissues, nerves, vessels, muscles or organs.

51. Dr. BRAUNE† draws attention to the fact, that by a peculiar mechanism in the passage of the vena cruralis

possibility-doctrine in the Gymnastic literature. Of all the authors who have attempted to approach an absolute completeness, nobody has come nearer the goal than SPIESS in his Turnlehre, 1840—46, which contains short and clear descriptions. The celebrated PESTALOZZI was the first who used the expression "completeness" in relation to his articular movements (Gelenkübungen, Assouplissement), but he did not push the question to the extreme as has since been done. "N'importe le nombre et la varieté? c'est la qualité qui constitue la valeur du mouvement:" an expression of Mr. N. DALLY, which here finds its *full* appreciation.

* These questions are shortly treated in LING'S "General Principles of Gymnastics," Part 6, No. 8, and Obs. 7 and 8; and have also been somewhat more enlarged upon in HG. ROTHSTEIN'S "System der Gymnastik;" and lately in HARTELII, *Periodical for Gymnastics*, 1878.

† Dr. WM. BRAUNE. "Die Oberschenkelvene des Menschen in Anatomischer und Klinischer Beziehung." Leipzig, 1873.

through the foramen in the adductor magnus, a pumping action is produced by which the blood is propelled upwards at every step in walking.

52. Professor CHR. LOVÉN,* in an interesting book "On the Blood," states the fact, that in order to facilitate the movement of the blood-current in the veins (which from the existence of the valves must be regarded as essentially a pumping apparatus), there is at most of the joints, but especially where the extremities are connected with the trunk, viz., at the inguinal region, the shoulders, and the lower part of the neck (where the fasciæ are expanded over the large veins), a mechanism by which the walls of the veins are drawn apart and a suction produced by inspiration. A similar mechanism for accelerating the blood-current is, according to Professor L., to be found in the passage of the vena cava through the foramen quadrilaterum of the diaphragm, to the edges of which the vein is attached.

The habit common among strong young men of "showing the biceps" with fully bent arm, produces in many persons a redness of the skin and swelling of the cutaneous veins, proving that muscular contraction presses the contents of their corresponding vessels to the nearest surrounding sanguineous canals. This fact belongs to the same order of biological phenomena that dictates the known rule to move the fingers, when in cases of venesection the blood does not flow freely. Here might also be mentioned the experiment of the celebrated physiologist, Professor LUDWIG of Leipzig, showing that passive movements applied to the toes of a dog increase the flow of the blood-current towards the thoracic duct. This observation has been referred to in an interesting lecture by Professor LOVÉN, with the pertinent remark

* Prof. CHR. LOVÉN; "The Blood: its circulation and its importance for the nutrition of the various tissues of the body." From "Popular records of the scientific research of our time." Edited by Dr. A. KEY and Dr. G. RETZIUS. Stockholm, 1876.

that "this case shows that science often confirms and explains what has empirically been employed in practical use"—namely in this case, by the passive movements in the Kinetic treatment.

It is certainly not too early here to refer to Dr. REIMER'S assertion advanced as early as 1849, and afterwards repeated by other authors. He says, p. 80:—"Die Brantingsche theorie dass die activen Bewegungen auf die Neubildungs—die passiven auf den Rückbildungs—process wirken—wird wohl auch zum grossen schaden der leidenden Menschheit niemals erweisen werden." When Dr. R. adds that the writer has essentially given up these theories,* he is glad of this opportunity emphatically to deny this assertion as completely erroneous. The writer still holds in the main the same opinion as to the action of active and passive movements as expressed in his *Kinésithérapie*, Paris, 1847. If nothing else, this proves that even at that time empiricism was accompanied by attempts to explain the effects of certain movements, though these do not square with the latest attempts in the same direction (see the art. on Massage).

Some of the above observations prove that a great change has taken place in reference to ideas in physiology since 1847, when the writer, after the publication of the abovementioned aperçu of LING'S System, was, in the well-known *Revue Encyclopédique*, accused of being a rank materialist, on account of his having directed attention to the pumping action of the heart and other instances of mechanical arrangements in the human frame, as illustrative and confirmatory of the influence of mechanical agencies generally on the bodily structure.

Everybody is aware that, if a joint be forcibly kept in a certain position for some time, either in extreme flexion or extension, &c., a sensation of increasing discomfort or benumbing (engourdissement) is produced. This sensation

* "Massmann; Altes und Neues von Turnen." 1849.

obliges one sooner or later to make an instinctive movement, which is always opposite to the painfully-sustained position. The same is also observed with persons or even animals awakening from sleep. The usual *explanation* is, that want of motion has caused a local stagnation of the fluids in the various capillaries and tissues, exercising a pressure on the corresponding nerves. This popular example in its many varieties seems convincing as regards the necessity of active muscular motion in reference to circulation.

Prof. CHR. LOVÉN mentions a similar case (p. 60, *op. cit.*). In the medical no less than in the educational gymnastics, a great many instances might be mentioned of instinctive movements, so to speak, which regulate the circulation in correspondence with natural indications.

53. Dr. TURCK, of Plombières, has published a series of cases in which great relief had been obtained by compression of one or both carotid arteries, or rather the pneumo-gastric nerve, during a more or less long space of time. Violent colic without diarrhœa, which had lasted fifteen years, recent phthisis, gastralgia, sciatic pains, &c., were relieved by this operation. Dr. TURCK was led to try this extraordinary therapeutic means (*sic*) because PARRY, LISTON, PRESTON, in England, and BLAND, TROUSSEAU, &c., in France, had observed good results from this in facial neuralgia.*

54. Dr. TODD considers that pressure of the carotids, with the object of cutting short epileptic fits, is dangerous like everything that interferes with the circulation.† (See further on, on the scruples expressed against pressure on certain veins.)

* "The Lancet," Dec. 20th, 1851. "Compression of the Carotid Arteries for the Relief of Pain in the Trunk and Limbs."

† "On the Treatment of Delirium and Coma." By Dr. R. B. TODD. ("Braithwait's Retrospect.")

55. Dr. REUMONT relates eight cases of nervous affections cured by pressure on the carotid arteries.*

56. Mr. ALLIER has had recourse to compression of the carotids in the case of a man aged 40, of nervous temperament, who, during a convalescence, suffered from neuralgia of the supra-orbital nerve, an affection to which he was liable. The carotid pressure was used after a week's intense suffering, on the same side as the pain, during the last part of the morning, every quarter of an hour, with an interval of five or six minutes. A certain degree of somnolence accompanied by *engourdissement* was observed. The pain discontinued, but immediately afterwards a shooting pain attacked the dorsum penis, radiating from the pubis towards the glans. These symptoms disappeared by using compression of the abdominal aorta during three-quarters of an hour, without reappearing in any other part of the body.†

57. Mr. SOMERVILLE OLIVER recommends arterial compression as a means of arresting inflammation after wounds, having seen the favourable result unintentionally attained by compression of the radial and ulnar arteries at the wrist in a severe wound in the palm of the hand. He recommends, therefore, under similar circumstances, compression of the main artery supplying an inflamed part as the most potent means of arresting inflammation. For example: in inflammation of the foot, pressure on the anterior and posterior tibial arteries may be resorted to; for inflammation of the leg and knee, pressure on the common or superficial femoral; for inflammation of the hand, pressure on the radial and ulnar arteries at the wrist; for inflammation of the forearm or elbow, pressure of the brachial artery at the upper third of the arm, &c.‡

* "Revue Médicale Chirurgique," Vol. IX., Oct. 1851.

† "Medical Circular," Jan. 31st, 1855.

‡ "The Lancet," March 12th, 1859.

58. The celebrated Paduan surgeon, Professor VANZETTY, "On Manual Compression in the Treatment of Aneurism and Inflammation," giving a short aperçu of the treatment of aneurism, which he was the first to introduce, observes in a communication to the Académie des Sciences that, "although compression of the artery by the hand had occasionally been employed as an adjuvant to other means of treating aneurism, yet this simple and natural method had never been proposed as the sole means of treatment until he had himself resorted to it. Having seen in Dublin, 1843, the inconvenience of producing compression by the aid of mechanical appliances, he has had in view its substitution by the hand; which he has put into practical use since 1853." "From the time," he says, "when I ascertained that the true method of treating aneurisms is to compress the arterial trunk with the unaided hand, I did not doubt that such obvious and perfect means of intercepting the flow of blood in an artery might also be available in the treatment of inflammations, in any part in which the principal artery admits of compression with the finger. I have many times employed, without other help, digital compression of the femoral, the brachial or the sub-clavian in phlegmons, articular inflammations, &c.; and I found it so efficacious, that I made it the ordinary method of treatment in every emergency in my clinique in which it was practicable. The cause of the salutary effects which must follow diminished supply, or retarded impetus of blood to an inflamed part, is too manifest to need an explanation."*

The treatment of aneurism by manual compression has since by degrees become an established fact in conservative surgery; and is at present generally admitted, and successfully used, by distinguished surgeons, as shown by the

* "Treatment of Fractures of the Limbs." By SAMPSON GAMGEE. London, 1871. Translated from "Giornale Veneto di Scienze Mediche," v. X.

many cases reported in "The Lancet" and other medical periodicals.

59. The treatment of popliteal aneurism by enforced and sustained flexion, introduced by Mr. ERNEST HART, F.R.C.S., belongs to the order of facts here collected in illustration of the important results of mechanical agencies. Several interesting cases have appeared in "The Lancet," proving the effect of this ingenious and simple method. (See for instance, "The Lancet" for May 7th, 1859.)

60. Dr. MERZ states that by compressing the carotids he has derived great advantage in hemicrania. He has used it in twenty-four cases, compressing the artery on the side affected for a quarter of an hour daily.*

61. Dr. DEBOUT, in pointing out the distinction between the syncope after traumatic hæmorrhage and fainting resulting from uterine hæmorrhage—the former being more rapid and more serious—says, that the remedy in this case consists in putting the patient upon his back and in lessening the force of the circulation by abdominal pressure.†

62. Dr. LIEDBECK, of Stockholm, and Dr. KALLENBACK, of Berlin, have testified to the happy effects of compression of the carotid arteries.‡

63. Dr. MELHIUS, in a severe otitis, having applied compression for some minutes to the carotid artery on one side,

* "Presse Belge," 1859, No. 12. "Medical Times and Gazette," March 28th, 1859.

† "Bulletin de Thérapeutique"; "The Lancet," May 12th, 1860.

‡ "Medic. Jahrbücher für specifische Heilkunde," B. IV., p. 277. Berlin, 1841.

found that the pains ceased and other symptoms of inflammation abated.*

64. The same means were used successfully by Dr. PETEL of Paris, in subduing convulsions in a boy three years old; and in a case of neuralgia of the supra-orbital nerve, a perfect and durable cure was thus effected.†

65. Dr. REINER tried the compression of both the carotids in epilepsy. The young patient had, within eight years, 500 epileptic attacks. The pressure, which was practised 22 times on the first precursory symptoms, always had the effect of reducing the paroxysm to a few almost insignificant convulsive movements. Meanwhile, the patient's general condition, both bodily and mental, has greatly improved.‡

66. Dr. POCKELS states that the compression of the brachial artery, either by means of the hand, the back of a chair, or a tourniquet, is a very useful mode of procedure, at once relieving pain in *panaris*, by hastening the course of the process, or frequently cutting it short. ("Varges Zeitschrift," Vol. XV., No. 3.)§

67. The writer has seen in a medical journal, the title of which is unfortunately lost, a very simple remedy recommended in panaris. As soon as you observe an increased heat, pulsations, redness, and suspect that a panaris is in formation, the hand should be elevated above the head, and held in this position as long as possible. As this position is very fatiguing if maintained for a length of time, the elbow should be supported by a towel, which by a cord is fixed in

* "Medical Gazette," London, July 1835; and "Froriep's Not.," 1836, No. 1080.

† "Revue Médicale," Janvier 1838, p. 261, 263.

‡ "Medical Times and Gazette," Feb. 13, 1858.

§ "Medical Times and Gazette," Aug. 23, 1842.

the ceiling or at any other elevated point. The elevation of any part of the body in such a manner as to prevent the impulse of the arterial wave, or to facilitate the return of the venous flow towards the heart, approximates in its effects to direct arterial pressure.

68. The following observation on compression of the arteries will be found in Dr. VELPEAU'S work on Surgery (American Edition, Vol. I., p. 649): "As compression moderates and even arrests the circulation in the organs situated underneath, it seems at first sight to constitute an excellent remedy in congestions, engorgements, and acute inflammations of all kinds. It is therefore somewhat surprising that physicians should for so many years have omitted to make use of it from this point of view. At the present time (1839) the mind appears to be taking another direction, and compression of the arteries, if we are to believe its partisans, should become a sovereign remedy in convulsions, epilepsy, inflammation of the limbs," &c.

Direct pressure on the arteries has not been so much in use in the Ling-Kinetic treatment as it seems to deserve; especially since CLAUDE BERNARD'S beautiful research into the action of the vaso-motor nerves, which we know accompany the arteries more or less. In order to act on the tonic contractility of the capillaries, pressures on the larger venous trunks have instead been freely used. Thus, in order to act on the cerebral capillaries and vascular ramifications of brain and meninges in general, BRANTING introduced in his practice direct pressure of the jugular veins, which pressure having been sustained from five to twenty seconds, is enough to produce a momentary stasis. This operation generally produces, as reaction, a decided paleness of the face, as well as a sensation of coolness about the head. To produce a similar action on the capillaries of the extremities, a tourniquet, without the pad, has been applied for from three to five minutes

above the part, on the capillaries of which it was desired to act, by producing such an artificial stasis. LING used at first to obtain similar results by altered or inverted positions of the body. This process has lately been severely criticised and condemned by medical men in Sweden as dangerous. The writer has used these vein-pressures in numbers of cases, during more than thirty years, and has found them answer well, while symptoms of a dangerous character have not occurred in a single case.

The following observation is the result of direct experience: The application of the jugular-vein pressure requires a certain amount of practice, in order to avoid the transmission of the pressure to the carotids. It has happened, in consequence of insufficient care and precision, that patients have felt a transient sensation of fainting (when the carotids have been compressed instead of the veins), which, however, passes instantaneously when the hands are removed.

The subjoined case, in its full extravagance, does not seem to justify any cause of apprehension as to the practice.

"Monsieur ALPHONSE THEVELIN has just been" ("La Presse," Sept. 4, 1851) "subjected to a very curious experiment. In the presence of a medical commission, he has remained eleven minutes suspended by the feet to a cord, the head hanging downwards. He did not experience or manifest any discomfort; and in this position he breakfasted perfectly well, and neither the stomach nor the digestion were affected by it."

It has been observed that in certain individuals dangerous and even fatal accidents have occurred as a consequence of a deep bowing of the head, as well as by only lifting the foot with the aid of the hand, as in pulling off the boots, &c. Through fear of such a result, persons have been warned not even to take up a pin from the floor, &c. This is evidently dependent either on the presence of an organic heart disease or on a morbid condition of the cerebral vessels, or a long

habit of corporal inactivity, &c. The writer has seen our gymnastic Nestor, Professor BRANTING, in his eightieth year, occupying an inverted position (in fact, standing on his head in the corner of his couch) for a few seconds; as he himself observed, in order to prevent cerebral congestion or fits of apoplexy. Is it owing to this practice, which he has jocosely characterised as "washing the brain," that at his advanced age he is still able to attend a numerous *clientèle*, and besides consultations for several hours daily, to take an active part in the fatiguing work of administering movements to his patients? Who is to decide?

69. The effect of a change, apparently insignificant, in the relative position of some of the parts of the body, is sometimes instantaneous and remarkable. Dr. NEGRIER, by accidentally holding his arms extended above his head, found that the bleeding of his upper lip from a cut, whilst shaving, ceased. He inferred from this experiment on himself, that epistaxis would thereby be stopped; and he gives cases in which, by directing his patients to keep their arms above the head for two or three minutes, the bleeding from the nose ceased.* It is easy to convince oneself of the effect of this simple operation. The writer has seen a great many cases thus relieved in epistaxis.

70. "If the arms are kept stretched above the head in a vertical position," says Dr. BORROWS, "it sometimes produces faintness. The heart has thus to overcome the resistance of the gravity of the blood in the arteries of the upper extremities, and the consequence is a diminution of blood in the cerebral arteries."† This observation may in some measure help to explain Dr. NEGRIER'S facts.

* "Archive Gen. de Médicine," Juin 1842, from Allg.-Rep. d. d. m. ch. Journ., Nov. 1842, p. 191.

† BORROWS, "Beobacht über die Krankh. d. cerebral Blutkreislauf," deutsch v. Dr. POSNER. Wein, 1847, p. 49.

71. M. TOURNEZ, in recommending again the above process of elevation of the arm in epistaxis, on the side on which the bleeding occurs, says that he had the opportunity of verifying the importance of this means during the march of a detachment of troops, in which twenty-eight soldiers were attacked by epistaxis, which the indicated position arrested in less than one or two minutes.*

72. Dr. MARIN of Geneva has discovered a new and simple method of "arresting hæmorrhage from the nasal cavity, by applying a pressure to the facial artery at a point immediately below the alæ of the nose, where the vessel can be pressed against the superior maxillary bone." Dr. MARIN has had occasion to give numerous trials to his method, and has generally found it effective. In two instances where it failed, plugging the posterior nares was attended with like result.†

73. The following observation on the effects of position may be added, as one of the curiosities of this collection of facts. "It often happens," says Dr. BOISMONT, "that, after having held the head bent down for some time, one feels giddy and dazzled on raising it, light, fire and sparks glaring before the eyes; in the ears also, tiring, buzzing noises are experienced. With some persons this position seems even to have caused hallucinations. A servant was cleaning a staircase; on raising her head she saw a pair of feet, then legs, both of such large dimensions, that, seized with fright, she fled away with great speed, without waiting to see the complete development of the apparition. The ignorance of this girl hindered her from ascertaining the unlikelihood of the vision, as a more enlightened person would probably have done."‡ (FERRIAR.)

* "Gazette Hebdomadaire de Médicine et Chirurgie" du 15 Juin, 1855, p. 453.

† "Journ. de Méd. et Chir. Prat.," and "Boston Med. and Chir. Journ.," 1872.

‡ "History of Hallucinations," by Dr. BOISMONT.

74. Mr. BOWLES has some "Observations on Stertor, and on the varying conditions upon which it is dependent; with the treatment necessary for its relief,"* from which the following extract may be of interest, as showing the effects of position.

"Stertor arises either from paralysis of the velum palati, or from paralysed tongue falling back in the throat, or from pressure of mucus in the pharynx and the air passages. In watching a case of apoplexy, in which coma and stertorous breathing had lasted for some hours, he found some fluid ejected from the stomach, which, lodged in the pharynx, would have suffocated the patient, had he not quickly been turned on his side and the fluid thus allowed slowly to drain away. In this position the stertor ceased; but returned as soon as the supine position was resumed. In a case of epilepsy in which stertorous breathing had intervened, the moment lateral position was assumed the stertor ceased. . . . . In one case, the patient being in articulo mortis, he was placed on his side, putting the pillow in such a position that the saliva could flow freely out, and by that means the sound so distressing to bystanders, known as the 'death-rattle,' was prevented." It is known to the writer that Dr. LIEDBECK, among others, used to recommend the lateral position under the above circumstances.

75. The celebrated Dr. MARSHALL HALL has, by his discovery of the excito-motory phenomena, largely contributed to the scientific explanation of many of the effects resulting from the application of mechanical agencies.

The late Professor C. BOCK, with reference to these phenomena, has in his "Pathological Anatomy" the following:—"The above mentioned reflex-motions must also be observed in therapeutics, in order that by irritation of the sensory and motory nerves, reflex and associated movements

* "Med. Times and Gazette," Feb. 14, 1860.

may be produced, especially in the respiratory, circulatory and digestive organs. The cure of many diseases by the *medical gymnastics in Sweden* depends on these circumstances."*

As a practical application of the physiological principles of the excito-motory phenomena, the following rules for the treatment of choking are borrowed from MARSHALL HALL, the means he proposes being exclusively mechanical.† "The danger (from a morsel of food remaining in the pharynx‡) arises, not from mechanical pressure on the larynx or trachea, but from a reflex action closing the glottis. The remedy must be *immediate*. Now this is what should be done. Pressure being made on the abdomen, to prevent the descent of the diaphragm, a forcible blow should be made by the flat hand on the thorax. The effect of this is to induce an effort similar to that of expiration; the larynx being closed, œsophageal vomiting takes place and the morsel is dislodged. If this plan fail, not an instant being lost, the pressure should be kept up on the abdomen, the finger should be introduced into the throat, and the same smart and forcible blow made on the thorax as before. By the irritation (mechanical) of the fauces, the cardia is opened, and by the blow on the thorax (the pressure being made on the abdomen), an effort similar to that of expiration with a closed larynx is made, and a direct vomiting occurs," &c. Another experiment of Dr. M. HALL on a turtle affords a proof of the effect of a pressure directed, through the relaxed integuments, to the nerves of the rectum.

* CARL BOCK. "Lehrbuch der Pathologischen Anatomie." Leipzig, 1847. p. 572.

† MARSHALL HALL. "On the Diseases and Derangements of the Nervous System." London, 1841. p. 79.

‡ The popular remedy in these often alarming *symptoms* is a smart blow between the shoulders. The writer once saved his own mother from choking by this interscapular blow, alternate with laryngeal vibrations.

Nerve pressures have been in extensive and early use in Kinetic practice, and with great advantage in some forms of constipation, paralysis, neuralgia, &c. This pressure on the nerves of the rectum was first introduced by Prof. BRANTING, as also pressure on the nerves of the bladder, the womb, the sciatic, the crural and the popliteal nerves, &c.; on the coeliac plexus, the pneumogastric, the accessory of Willis, the superior and inferior laryngeal nerves, the supra et infra orbital, the auricular and occipital nerves; the facial nerve and its ramifications, the lingual, the cervical portion of the sympathetic, the phrenic nerve, the brachial plexus, and the main trunks of nerves of the arms, hands, legs and feet. Many of these operations were already introduced by LING, and have been made use of by the writer as well as by later followers of the system.

As some few hints about the technical varieties of three of the principal forms of manipulation, viz., friction, percussion and pressure, have been made; it would have been well also to say a few words on the other forms of passive motions, viz., *vibration*, *sawing*, *pulling*, *kneading*, *pinching*, *binding* (tourniquet), *passive rotation* (neck, trunk, hip, &c.), *ringing*, &c. This, however, space will not permit, and without an accurate description it would be of no real use.

76. Dr. BASTIAN and Dr. VULPIAN, in a memoir* on the effects of compression of nerves; after a great number of experiments, divide the effects into two periods: the first, or period of increase, which commences and finishes with the compression; the second, or the period of reaction or decline, which begins at the moment when the compression has ceased, and ceases with the complete return to a normal state of the parts which are under the influence or control of the compressed nerve. The writer has merely mentioned these interesting experiments on the part of the distin-

* "The Lancet," April 29th, 1876.

guished physiologists, and he welcomes such labours and labourers in a field of research where so rich a harvest lies in store for the truth-seeking enquirer.

77. MARSHALL HALL has crowned the close of a glorious career of physiological research, by what is a labour of love and of service to the whole human race. By his "ready method" he has already been the means of saving many lives; and so it will continue to the end of time, if physicians will remember and carry out to the letter his simple and practical treatment of apnœa in drowning, and in cases of still-born infants, nay, in other cases of asphyxia, or even only in difficult breathing (dyspnœa). It would be out of place here to stop to inquire in how far MARSHALL HALL, in his prone and postural method,* is indebted to the popular practice of rolling in the rescue from drowning, be it on casks as formerly in England, or simply rolling the patient over and over on the ground, as used by the people in Sweden or on the Continent. Suction from mouth to mouth is another popular measure; so also holding the patient up by the feet—grounded on what M. HALL has proved to be an error —"the idea of emptying the lungs and the stomach, of water imbibed during the period of submersion."† Our author

* "Prone and Postural Respiration in Drowning and in other forms of Apnœa or Suspended Respiration." By MARSHALL HALL, M.D., &c. London, 1857.

† The following extraordinary mode of resuscitation (note p. 169) is well worth recording:—"A youth named Henry Rice, having fallen into the Basin, City Road, a quarter of an hour elapsed before he could be got out. The boy was conveyed to the 'Wenlock Arms," and two surgeons immediately attended, who, after an hour's exertion, were unsuccessful in their attempts to restore the youth to life. A drunken man in the tap-room, waking from his sleep, and learning that the medical men had failed in their attempts, staggered into the room and said he would restore the boy; and applying his mouth to that of the youth (at the same time including the nostrils), by strong suction, as if drawing the breath from the patient, actually renovated the lad in a few minutes, to the astonishment

admits that by the rolling, respiration might be produced; that mouth to mouth suction or forcing might be successful; but might also be ineffectual or fatal as the case might be.

From physiological inductions derived from a series of experiments, MARSHALL HALL has arrived at establishing the principle: first to attempt to restore respiration, and afterwards circulation and warmth. The importance of the subject will be an excuse for copying the following rules which MARSHALL HALL laid down for his method.

Rules to be applied in every case:—Treat the patient *instantly on the spot, in the open air, exposing* the face and chest to the *breeze* (except in cold weather).

I. *To clear the throat.*—Place the patient gently on the face with one wrist under the forehead (all fluids and the tongue itself then fall forward, leaving the entrance into the windpipe *free*). If there be breathing, wait and watch; if not, or if it fail—

II. *To excite respiration.*—Turn the patient well and *instantly* on his side, and excite the nostrils with snuff, the throat with a feather, &c., and dash cold water in the face previously rubbed warm. If there be no success, *lose not a moment*, but instantly—

of all present. This was the ninth person whom this individual had restored in a similar manner. This extraordinary case has excited much speculation, and has led to the conjecture that an instrument might be made to answer the means adopted in these instances of resuscitation; which would be highly beneficial in every point of view."

Dr. LAWRENCE, of Carmarthen, from having seen the above case in a paper many years ago, mentions also another, in which a chimney sweeper's boy, after the failure of the medical men, came forward and said he would restore the patient. He began the suction, and the patient recovered. A case is mentioned also, in which Mr. MARSHALL HALL'S treatment had failed from being carelessly used, and where suction had proved successful. The same physician mentions the case of his own child, who was considered dying from asphyxia in a fit of whooping-cough, and who, to the great astonishment of his medical friend, who had given the case up as lost, was completely but gradually recovered.

III. *To initiate respiration.*—Replace the patient on his face, raising and supporting the chest and abdomen well, on a folded coat or other article of dress; turn the body very *gently on the side and a little beyond*, and then *briskly* on the face, alternately, repeating these measures deliberately, efficiently and perseveringly *fifteen times* in the minute, occasionally *varying the side*; (when the patient reposes on the *chest*, the cavity is compressed by the weight of the trunk, and expiration takes place; when he is turned on the side, the pressure is removed, and inspiration occurs.) When the prone position is resumed, make equable but efficient *pressure* with brisk movement along the back of the *chest*, removing it gently immediately before rotation on the side; (the first measure augments the expiration, the second commences inspiration, the *result is respiration, and if not too late—life.*)

IV. *To induce circulation and warmth.*—Rub the limbs *upwards* with *firm grasping pressure* and with *energy*, using handkerchiefs, &c.; (by this measure the blood is propelled along the veins towards the heart.) Let the limbs be thus dried and warmed, and then clothed, the bystanders supplying coats, &c. *Avoid the continuous warm bath*, and the position on or inclined to the back.

The treatment of the still-born is the same, with some necessary modifications.

Several cases of successful results from the application of the methods in drowning, in still-born, and in narcotism, are reported from different medical men.

The writer had the opportunity, in 1860, of testing the value of the ready method in the case of his first-born child, who had a severe attack of whooping-cough, when only six weeks old. He was suddenly called to the nursery, and found the child, after a severe fit, in a complete state of asphyxia, breathless, and apparently lifeless. After four or five minutes of "postural breathing," signs of life commenced

to be manifested, and after another minute or two, and the application of "*chest-lift vibration*," breathing and circulation were completely restored. Further attacks were afterwards controlled and prevented by slow and intensive frictions (passes) from the chin towards the pit of the stomach.

The writer has been informed by Captain TÖRNGREN, R.N., one of the teachers at the Central Gymnastic Institution at Stockholm, that when his three boys were suffering from whooping-cough, he always succeeded in warding off an attack by laying hold of both hands and stretching the arms by a sudden lifting upwards, and holding them in that position for a minute or two. The little boys—respectively from two to six years old—always came of their own accord running to the father, to get relief by having this movement applied. Thus in pertussis the mechanical agency promises to be of great use,—at least in modifying the severity of the attacks.

78. There is yet another plan of rescuing from drowning, proposed by Dr. SYLVESTER, going under his name, and adopted by the Royal Humane Society (Hyde Park). It consists in bringing about artificial respiration by means of raising the arms, by a gentleman standing behind the asphyxiated person laying hold of both his arms at the elbows. When the arms have been well extended, thus enforcing inspiration, a pressure is made on the thorax laterally, to imitate or produce expiration.

These two movements, made alternately, very much resemble a movement LING used to prescribe some fifty years ago for dyspnœa; the only difference being that the operator, in making the lifting, stands behind, and lays hold under the axillæ, whilst the other operator, who stands in front, makes a strong "*lift-friction*," with more or less strong pressure from behind forwards, along the insertion of the diaphragm. (See fig. 90 in Dr. HARTELIUS' "Manual of Medical Gymnastics,"

as to position of the first operator.) A great many patients have by this "pumping movement" been relieved, in difficult breathing, in congestion of the lungs from heart disease, &c.

79. In the "Journal d'Hygiène," No. 119, 2nd Jan., 1879, there is a fig. of Dr. M. HALL'S ready method (fig. 1, 2) and of that of Dr. SYLVESTER'S (fig. 3, 4), also a description of the procedure of Professor PACINI of Florence (fig. 5), according to which the asphyxiated person, on whom you desire to produce artificial respiration, is placed on his back; the head, resting on the table, is maintained in its ordinary position; and an assistant is placed at the feet or legs, which are fixed or rather drawn downwards, in order to aid in the drawing down of the diaphragm, thus facilitating the inspiration. The operator, placing himself behind the head, lays hold of the shoulders, the thumb forward, the other fingers and hand behind, grasping the upper part of the humerus, and begins by drawing the shoulders towards himself (per trarlo a se' et sollevarlo); he thus attempts to utilise the connection of the clavicles with the sternum, in order to elevate this bone with the corresponding ribs. When ceasing the traction, the expiration takes place, by the elasticity of the ribs; and by alternating these two movements in the ordinary rhythm of the breathing, or more accelerated if deemed necessary, "one hears the breathing as in a living being," and "if there is still a spark of life left, it is impossible that it should not be rekindled."

80. The process of Dr. HOWARD is characterised by the name of "la methode directe." The asphyxiated person is placed on the back, with a cushion under the loins, in order to raise (faire bomber) the thorax, and the arms are elevated over the head. The medical man, after having knelt down, keeping the body of the patient between his knees, applies his hands flat on the side of the thorax, the thumbs approach-

ing the xyphoid process, the fingers broadly spread on the sides in correspondence with the intercostal spaces. The operator then throws himself forwards on the level of the patient's face, whilst leaning with the weight of his body and the pressure of his hands on the thorax; then, after two or three seconds, he raises himself suddenly in the kneeling position. The manœuvre is repeated six or seven times a minute.

This method appears to be calculated to act principally through an increased expiratory action, which must, according to the law of elasticity, increase inspiration.*

The writer might be allowed to add the following general observation in relation to what has already been noted. The Swedish method does not make a preponderating use of the arm only, in order to produce its own development. The arm and shoulder are essentially the external mechanism, the movements and positions of which are employed in order to produce, by way of Gymnastics, the most important effects on the thorax and its organs. Direct experiments at the dissecting-room of the Gymn. Centr. Institution of Stockholm have shown that the most movable point of the essentially pectoral region, situated between the middle part and the anterior third of the fourth rib, is raised about one inch by the raising of the arm.† This circumstance may especially

* A movement used by Professor BRANTING in cases of emphysema, somewhat resembles Dr. HOWARD'S procedure: it consisted in strong "girt-pressure" round the lower part of the thorax, by the hands of two operators, who suddenly let go the pressure both at the same time. The patient is generally in a loose sitting position. The fact that, as above mentioned, there exists five different methods of restoring life mechanico modo, is in itself too remarkable to pass unnoticed.

† A fig. to this position, and some others belonging to movements indicated in "La Kinésithérapie," Paris, 1847, is in the collection of drawings, still unpublished, executed by Prof. LING, fils. Though these drawings principally illustrate exercises of the pedagogic group, they amount to from 2000 to 3000 figs. The merest tyro will understand the importance of a complete collection of illustrations. The want of such a publication

be seen in the Kinetic type which the writer has mentioned, in his pamphlet on LING'S system, p. 79 and note, 1847.

81. The method of Dr. MATTEI is also described in the above journal. It is applicable principally in cases of still-born children, and is called by the inventor "methodic succussion." It consists, when there still remains some pulsations of the heart, in seizing the new-born baby with both hands under the axillæ, in such a manner as that the head shall be fixed, and at the same time lifting the shoulders. The child is then gently shaken, in the same manner as you do in attempting to shake something down in a bag. By means of these secousses, methodically performed, one produces artificially both inspiration and expiration.

82. Dr. PIRETTI has arrested hiccup by a compression round the wrists (the right is preferable), on the level with the carpus. One makes the pressure either by the thumb and the index finger, placed so as to surround the wrist, or with a band bound tight round the indicated region. The pressure should be more or less strong, in proportion to the fatness of the individual. Dr. VIRETH observes, in the way of explanation, that the radial and cubital nerves, on the branches of which the pressure acts, come from the cervical nerves, which help to form the brachial plexus; and that the phrenic nerve, which regulates the phenomena of hiccup, gets its fibrils equally from the brachial and the cervical plexus of nerves.*

Another popular method of curing hiccup consists in looking up to the ceiling, above the head, for a minute or two. By the enforced bending of the head, the muscles of

has been felt ever since the origin of LING'S system. But still this valuable collection remains hidden in the draughtsman's portfolios! Whose is the fault?

* "Il fiatre sebezio," "Gazette Hom. de Paris," No. 20, Juillet 1850.

the larynx get into a state of strong tension. The writer has repeatedly seen hiccup thus disappear. Swallowing dry, repeatedly, six or eight times, will also stop a hiccup.

83. Dr. HEATON, of Leeds Infirmary, makes mention of a case of "involuntary rotation of the head cured by continual pressure on the neck." On examining the patient one day it was found that "a firm pressure with the finger over a spot, a little below and anterior to the root of the left ear, immediately behind the angle of the jaw, had the effect of completely arresting the movement." The effect of the pressure seems to have been "as prompt and complete as the stopping of a machine when disconnected from the motive force." "The effect was also produced, though not so completely, by pressure on the opposite side." Medicine, as well as galvanism, had been tried in vain. An apparatus was applied producing a pressure, for some weeks, when the patient was dismissed cured.

In the remarks on the case, Dr. H. observes: "The curious pathological fact of the existence of points on the surface of the body, by the pressure of which some morbid uncontrollable movement can be arrested, has been observed in various instances. One or more such points have been discovered on the surface of the same patient; sometimes symmetrically placed, as in this case; sometimes dispersed irregularly. The point of efficient pressure sometimes overlies the course of the motor-nerve of the affected muscles; thus, for example, some convulsive movements of the face have been arrested by pressure over a branch of the trigeminous nerve. The pressure-point in this case would overlie the branches of the cervical plexus."*

From the writer's experience in similar cases, he is convinced that an intermittent or repeated firm pressure with the finger would have sufficed to effect a cure.

* "Braithwaite's Retrospect of Medicine," Vol. LXXIX., 89—92.

84. Deep inspirations in sea-sickness have proved singularly successful, in the case of a lady who always used to suffer most severely in crossing the Channel.* The writer used the same means with success some twenty years ago; and adopting at the same time a horizontal position, he has since repeatedly warded off attacks of sea-sickness in himself.

85. Pressure round the wrists has arrested or prevented epileptic fits. In the case of the late Dr. WASSER, formerly Surgeon of the Regiment of Chasseurs in Wermland (Sweden), a personal friend of the writer, he always succeeded in preventing a fit, when there was time to make the pressure at the instant he felt the aura epileptica commence. Monsieur BECKENSTEINER of Lyons, well and deservedly known as having introduced a new method in the application of metals, &c., in electro-therapeutics, has made mention of somewhat similar cases.

86. Mr. E. WIRTZ of Manchester, in answer to a query of W. A. D., in "The Lancet" of July 22, 1871, about the means of stopping hiccup, says: "The best means of stopping hiccup is to hold up your arms above the head for a minute or two. It is more effective in a standing than in a sitting position."

87. Dr. ESCALIER makes known the following simple mode in cases of treatment of asphyxia after chloroformation, and which has succeeded perfectly well in two cases: "In the first patient the inhalation lasted three minutes, and the hernia, for dealing with which it had been taken, was already reduced, when the patient remained without any pulse, and with suspended respiration. All the usual means having failed, the idea struck Dr. ESCALIER of plunging two fingers deep down in the throat, in order to excite vomiting, when

* GEORGE MUSGRAVE, "Ten Days in a French Parsonage."

immediately a deep expiration occurred, which announced the return of life. In the second case the patient, from the same cause, was found to be in a much more dangerous condition; so much so, that all the assistants looked upon him as already dead. Dr. ESCALIER plunged two fingers in the throat, as deep as possible, and kept them there during at least a minute—a time which was necessary, in order to secure a sufficient excitation and a return of the respiratory movements."*

88. Dr. RICCORD recommends insufflation from mouth to mouth, and has thus saved two patients from a state of apparent death from chloroform.

89. Dr. HOLMER has observed that the beating of the heart and the colour of the face, in cases of syncope from chloroformation, return by letting the head and the body assume an horizontal position. (GARNIER, 1869, p. 38.)

90. Dr. PLOUVIER recommends as a means to be employed against asphyxia by submersion and by chloroform, insufflation of air; or even only alternate compression of the thorax and of the abdomen, as a means of inducing physiological respiratory movements. (See pp. 74—79.)

91. Dr. CORMARK, in an article on infantile convulsions, mentions a case in which the patient was apparently restored from a state of suspended animation, by the touch of a finger thrust into the aperture of the larynx. He says: "In ascertaining if the tongue might possibly prevent the passage of the air into the larynx, I passed the finger along the side of the tongue until I got the end of it within the laryngeal opening, which I had no sooner done, than a gasping inspiration was made, which soon developed into regular breathing." Dr. C. mentions that he had previously seen a woman recover

* "Gazette Hom. de Paris," No. 27, 1853.

from apparent death, by the touch of the finger within the opening of the larynx. Afterwards, he had seen it succeed in a case of suspended animation from convulsion; and again, in a woman seventy years of age, partially axphyxiated from nitrous oxide gas at an operation."*

92. The following experiment, by Dr. R. Böhm of Dorpat,† proves the value of artificial respiration as a reviver in animals apparently dead. Dr. Böhm injects a few grains of potassium salts into the veins of cats, the heart soon ceasing to act from diminished blood-pressure. The breathing presently ceases, and the animal dies in convulsions. Dr. Böhm found that if *artificial respiration and rythmical compression of the thorax* commenced *within eight minutes* from the stoppage of the natural respiration, the heart suddenly, though sometimes not till after forty minutes, began to contract regularly. Spontaneous respiration returned in five minutes or less after the action of the heart had recommenced, and the animal awakened as if nothing had occurred. "It is difficult," says the author from whom the above extract has been made, "to decide whether the recovery in these cases was due to the mechanical excitation of the heart or to the slight movement of the blood shown by the manomètre to take place." Artificial respiration is thus, under certain circumstances, not to be relied on alone, but should be assisted by a firm pressure on the thorax.‡

93. Mr. F. Hodges, in cases of chloroformation—where as a premonitory symptom the face gets dusky or pale, pupils dilated, pulse full, respiration shallow—gently lowers the head, draws the chin from the sternum, *turns the patient slowly over on the left side, and presses firmly with the hand*

* "Medical Times and Gazette," Nov. 21, 1874.

† "Centralblatt," May 22, 1874.

‡ "The Lancet," Jnne 13, 1874.

beneath the heart, and in a very short time the patient's natural colour returns, the circulation and respiration become normal. Mr. HODGES has in several similar cases made use of the above simple and ready method.*

94. The "Bulletin de Thérapeutique" contains a case of Dr. PENGAULT of Poitiers (on preserving frictions in asphyxia), in which these frictions were useful. A young man had received, in a duel, a penetrating wound of the chest, and had lain cold for fourteen hours, with very distant beats of the heart. During all this time two men made vigorous frictions with hot towels, which were handed to them; and at the end of the fourteenth hour the pulsations became more frequent, and the patient finally recovered. In a case of placenta prœvia, where the process of detaching was performed, and the lady was dying from hæmorrhage, three hours' frictions with hot spirits over the præcordial regions and the whole body, with hot towels, restored her.†

95. Dr. NELATON, in his admirable inaugural *Thèse*, explains the influence of position in the following propositions: "Position, in whatsoever part of the body, and under whatsoever circumstances it acts, exercises its influence only in two ways—(1) in favouring or in neutralising the action of weight; (2) in favouring or neutralising certain organic resistances." After a short *résumé*, in which he mentions Drs. ARBEY, BOURDON, LACROIX, DUGAT-ESTUBLIER, GERDY, PIORRY, &c., as having published memoirs on the subject, Dr. N. gives a short account of the different ways in which the hæmostatic laws are manifested, in various pathological conditions, with regard to positions. Dr. NELATON'S pamphlet is of more importance for the gymnast than many large volumes which on their title-page bear the name Gymnastics.

* "The Lancet," Aug. 14, 1875.

† "Preserving Frictions in Asphyxia," "The Lancet," Feb. 22, 1861.

96. Dr. SYMONDS mentions the case of a lady "who can, at any time, bring on a fit of headache by turning the head to the right side. In two other cases, one of a lady, the other of a most distinguished physician, the pain may be brought on by lying on the back."*

97. Dr. COALE is convinced, from repeated observation, that persons suffering from irritability of the stomach are much less liable to vomit when they *lie on the right side* than when they recline in any other position, and especially on the left side. . . . . In treating flatulent or cramp-colic, this position has also been found beneficial, by favouring the escape of gas contained in the transverse or ascending colon."†

98. A correspondent in "L'Union Médicale" calls attention to the fact that "palpitations, when not depending upon organic disease, may be almost immediately arrested by bending the head downward, and allowing the arms to hang pendent. The effect is even more rapidly produced by holding the breath for a few seconds, while the body is in this bent position."‡

99. Dr. JACQUOT has, in "L'Union Médicale," an article on medical treatment among the Arabs, of which the following is an abstract: "A woman in labour takes two points of support; one with her feet against a bar, and the other with her hands, which are made to seize a rope fixed to the ceiling or the roof of the tent. Sometimes the matron places herself behind the patient, who is sitting down, throws her arms

* Dr. J. A. SYMONDS, "On Headache," "Med. Times and Gazette," April 17, 1858.

† "Amer. Journ. Med. Science," 1855, Vol. XXIX., p. 49; "The Med. Times and Gazette," March 10, 1855.

‡ "The Homœopathic World," 1876, Vol. XI., No. 125.

around her, and tosses her backwards and forwards; she then kneads the abdomen violently, and even mounts upon it. Mr. TURNERI mentions a still more savage custom: a handmill is made to work on the abdomen of the poor woman, with the hope that the weight and movements will excite the uterus. The matron often encircles the body with folded napkins, and pulls them so as to bring the uterus downwards, and the midwife titillates the neck of the organ with her finger dipped into a substance, the nature of which Dr. JACQUOT was not able to ascertain. . . . . The Moorish hot-air baths, with rubbing and kneading, seem to do good service in rheumatic affections, particularly when of the chronic kind."*

The natural act of parturition, being essentially bio-mechanical in its character, will no doubt become the object of consideration in the future, in order to aid the contractile forces of the abdominal muscles, &c. The writer heard LING ventilate this subject many years ago, but unfortunately he cannot now remember the details.

100. Dr. VELPEAU makes mention in his clinical lectures during the summer of 1847, of a kind of "*magnetic manipulation*," consisting of frictions on the abdomen from below upwards, and from right to left, the application of which (by a midwife) had in three weeks cured a case of complicated inflection of the womb, accompanied with severe symptomatic pains: a case in which he himself had completely failed. He considered these frictions to have acted on the excited imagination of the patient, as well as on the nervous system in general:" † a proof that the late celebrated surgeon of l'Hôpital de la Charité was not prepared to admit the effects of external manipulations upon internal organs.

* "The Lancet," Oct. 18, 1851.

† Dr. SKÖLDBERG, "Travelling Notes," "Hygiæa," a Swedish medical journal, August 1848.

101. Dr. BRETTY has mentioned the application of the tourniquet in metrorrhagia, and observes that it has been superior to other hæmostatic means, and stops not only the slow flux from the womb, but also violent and profuse hæmorrhage; and prevents, accordingly, the lingering weakness and slow convalescence, as well as stops the after-pains, &c.*

102. Dr. BROWN-SEQUARD recommends applications of ligatures in epilepsy.†

103. Dr. TYLER SMITH has made use of an application of mechanical agency in a case of uterine hæmorrhage after delivery, which proved successful. He says: "The peristaltic uterine action was stimulated by immediate irritation of the uterus, by external and internal pressure, and by cautious digitation upon the internal surface. The flow of blood was arrested *mechanically:* in the first instance by the abdominal pad and bandage; and afterwards, more successfully, by the hand in the uterus acting as a plug and an auxiliary to external pressure. In the peculiar condition of the uterus, nothing could have compensated for the temporary mechanical arrest of the flux." ‡

104. Among remedies employed in the treatment of hæmorrhages from rupture of the cervix uteri, Dr. MARTIN states that bi-manual compression with plugging has succeeded well. §

* BRETTY, "Uber die behandlung der Metrorrhagien mit Rücksichtigung d. Anwendung des Tourniquets" (Allg. Rep. der Deutsch Med. Chir. Journalistik, Aug. 1842, p. 198).

† "Medical Times and Gazette," Feb. 13, 1858.

‡ TYLER SMITH, "A Case of Uterine Hæmorrhage after Delivery," "The Lancet."

§ "Centralblatt für Med. Wissenschaft," No. 2, 1878. ("The Practitioner," April 1878.)

105. Dr. SENTION recommends compression of the aorta in uterine hæmorrhage, and describes the procedure as both easy and certain of success. He has convinced himself that the blood is thus prevented from entering the uterus, &c.

106. Dr. SPIEGELBERG of Berlin regards this practice as one of no utility; and agrees with Dr. SCHNEEMANN, in considering the cases which have been seemingly benefited by it to be really examples of excitement, resulting from contraction, induced by the friction of the uterus, made during the attempts at compression of the aorta.*

Professor BRANTING, more than thirty years ago, cured a case of violent uterine hæmorrhage in an elderly lady, by pressure directed to the abdominal aorta. (The writer.)

107. "I have more than once," says Dr. TH. CLEMENS, "stayed most intense (mortal) hæmorrhage by a strong compression of the abdominal aorta with the thumb against the spinal column: a process much to be recommended in flooding after delivery." †

108. An aortic compression below the diaphragm induces, according to Prof. SCHIFFS' experiment, peristaltic motion of the intestines, and contraction of the womb. Dr. CLEMENS repeated SCHIFFS' experiment with the same result. (*Op. cit.*) ‡

DONDERS maintains that everything that interferes with circulation (in that region?) causes peristaltic motion of the intestines. §

* "Medical Times and Gazette," Jan. 29, 1859.

† "Ueber die Heilwirkungen der Elehtricität," von Dr. TH. CLEMENS, 1876—79, p. 482.

‡ "Ueber das Hemmungsnervensystem für die peristaltischen Bewegungen der Därme," E. PHLÜGER, 1853.

§ DONDERS, "Physiologie des Menschen. Ubersetst von Theile," B. 1.

109. Dr. EASTLAKE recommends pressure on the fundus uteri for producing the expulsion of the placenta.

110. Dr. GRAILY HEWITT, in corroborating Dr. EASTLAKE'S statement as to the effect of pressure over the fundus uteri, unaided by traction on the cord, mentions the following interesting fact: "In a case where pressure had been used for nearly an hour unavailingly, the uterus suddenly expelled the placenta, when the organ was grasped, one hand on each side, just at the junction of the Fallopian tubes with the body of the uterus."*

111. A writer in "The Lancet,"† describing a visit to Professor CHARCOT'S ward at the Hospice de la Salpetrière, mentions his having witnessed Dr. CHARCOT apply his method of stopping a fit instantaneously, in women affected with ovarian hysteria: "Two women fell into a fit, and Dr. CHARCOT, by applying pressure with the hands to the diseased ovary, arrested the paroxysm almost immediately."

112. Dr. HARNMAN, in the Hospital of Lourraine in Paris, has used the tampon in placenta prævia, and praises its application as remedying fluor albus, erosions on the cervix uteri, and also in blennorrhagia from the rectum.‡

A writer in "The Lancet" of April 14, 1877, in speaking of the old maxim that meddlesome midwifery is bad, observes: "Recent improvements, especially diagnosis by palpation and auscultation, version by the bi-polar method, external manipulation, or combined external and internal manipulation, and the perfection of the forceps, have fortunately rendered the old maxim of less force."

* "On the Management of the Third Stage of Labour," "The Lancet," Nov. 26, 1864.

† "The Lancet," p. 554, April 14, 1877.

‡ "Jahresbericht," 1841, p. 333.

113. Dr. CAZEAUX advises, in hæmorrhage produced by failing contraction of the womb, after confinement, the following manipulations: "One hand placed on the lower part of the abdomen, should friction, press, lay sharply hold of the uterine walls, whilst two fingers of the other hand, introduced in the vagina, rouses and irritates the neck of the womb. If these means are insufficient, the hand should be entirely introduced into the cavity of the organ, in order to stimulate and excite the inner surface with the fingers, whilst with the hand placed on the hypogastric region, the friction is continued. One is sometimes obliged to compress, and to knead, so to speak, the walls of the organ, by leaning on it strongly through the abdominal parietes, whilst the other hand, which remains in the interior, is used for counter-pressure."*

114. It would be an omission, on this occasion, not to mention a treatment of displacement and other affections of the womb, which has originated in Sweden, and which has been the subject of repeated discussions in the Society of Physicians in Stockholm, and the Medical Society in Christiania; and which, on account of the success which has attended it, has awakened considerable attention in the country generally.†

The writer wishes to mention, in a few words, the way in which this treatment originated. Mr. BRANDT, some years after having, with great credit, passed his examination at the Central Gymnastic Institution at Stockholm (1849), whilst on active service with his regiment, was suddenly called upon to replace a prolapsus ani which had occurred in

* CASEAUX, "Traité d'Accouchements," p. 930-1, from Estradère, du Massage.

† "Thure Brandt's Uteringymnastik, Discussion i det Medicinske Selskab foranledigt ved foredrag af Oscar Nissen, Cand. Med.," pp. 98. Christiania, 1875.

a soldier. The regimental surgeon being at the time absent from the camp, he was obliged to act at once; and not being acquainted with the ordinary manipulations used in order to replace the protruding gut, he, availing himself of his knowledge of the anatomy of the parts, and calling into practice the principles he had learned at the Gymnastic Institution, at once placed the soldier on his back, with the knees bent, and commenced to operate through the abdominal parietes, in making a deep pressure combined with a traction upwards and to the left; by the repetition of which movement, the gut was actually pulled in. Afterwards, in order to act on the sacral nerves, "*a pugn. percussion*" was applied on the sacrum, and by the means of these two movements, the soldier was able to turn out for drill the same afternoon, and was not troubled with his prolapsus afterwards. In Sweden, prolapsus uteri is a common complaint among the peasant-women, who are obliged to go about and to do heavy work, often immediately after confinement. As Mr. B. was then living in the country, the thought of applying a somewhat similar process to that which had succeeded so well with the soldier, in order to procure relief to the poor women, was not far fetched. He therefore employed for the purpose three movements, of which, in the 1st, by a lifting vibratory action, the womb was as it were drawn upwards or lifted; in the 2nd, a "*vibratory point-pressure*" was directed to act on the nerves and the ligaments of the organ; and in the 3rd, a "*pugnal percussion*" was applied on the lumbo-sacral region, from which the pelvic organs obtain nerve-supply, &c. The result proved the correctness of the suggestion; and by-and-by, through the reports of Mr. BRANDT'S success, and under the advice and patronage of some medical friends,* who soon saw the *rationale* of the treatment, his practice increased. He has gradually enlarged the sphere of his treatment, and at present, having treated upwards of 3000 cases,

* Dr. LIEDBECK, Dr. LEVIN, Dr. SKÖLDBERG, &c.

he has, with the aid of interior manipulations resembling in a measure those used by Dr. CAZEAUX (see p. 91), successfully treated cases of chronic metritis, para-metritis, internal tumours, &c., besides the various deflections of the womb. Mr. BRANDT has had several pupils amongst the Gynœcologists of Scandinavia, and is certainly the first Gymnast who has been engaged in a large and successful Gynœcological practice. Mr. B. has published two pamphlets on his method.

The writer is not aware how far Mr. B. lays any claim to having invented the movements he employs, a point which has been hinted at in the pamphlet of Mr. NISSEN (see note, p. 91). It is certain that they are partly successful modifications of movements and manipulations previously employed by LING, and BRANTING, as well as by the writer. Years before Mr. B. had become a pupil at the Gymnastic Institution, "the loin-lift vibration," as well as the "sacral or vesical nerve-pressure," and "the pugnal percussion" on the sacrum, had been much in use by LING and BRANTING* in the treatment of affections of the pelvic organs, viz., flooding, amenorrhœa, dysmenorrhœa, urethritis, "pertes seminales," &c. There is still a large margin to the credit of the originator of this speciality; and not the least, that of having introduced into the Gymnastic practice, examination and exploration of the female genital organs by a better process than that usually employed. The writer, who has tried the old plan of treatment as well as that of Mr. BRANDT, must give the palm to the latter, as affording generally a more prompt result: this especially in cases of prolapsus of the rectum or the womb respectively. As to the bi-manual or so-called "internal massage," the writer has had no experience, not having applied it. Mr. B. has, however, in a second edition of his pamphlet,† developed

* Compare the large collection of prescriptions by Prof. BRANTING, from 1828 to 1845 (29 volumes), which are incorporated with the manuscript collection in the Library of the Institution.

† "Die Bewegungscur als Heilmittel gegen Weibliche sog. Unterliebsleiden u. Prolapsen." Stockholm, 1880.

his method to a complete speciality, which in technical precision is of more importance than many modern Gymnastic innovations which put forward great claims as improvements. The writer has found, in cases of retroversion, great use made of the *sacral percussion* when applied in a knee-elbow position. A case of Mr. J. Baker Brown's ("The Lancet," Aug. 30, 1864) was cured by the patient lying on her stomach for some weeks; the surgeon only, "from time to time," replacing the fundus with the aid of the finger in the vagina.

115. The late celebrated Dr. Piorry,—who, by the by, showed great personal kindness to the writer, and took an interest in his attempts to introduce the Swedish Gymnastics into France, in 1847,—in his "Traité de Médicine Pratique,"* advises abdominal frictions with pressure in cases of development of gases in the intestines, which, pushing the diaphragm upwards, simulates or constitutes asthma. He observes that mechanic means are useful in a very different way from those we have enumerated. In the first instance, after having well ascertained that there is no mechanical obstacle to the elastic fluids, and especially if there are reasons to attribute the accumulation of the gas to the atony of the alimentary canal and to its excessive dilatation, one may employ with success pressure on the abdomen: "Commence then to operate on the left iliac region from upwards downwards, in order to direct the elastic fluids of the colon towards the rectum; afterwards, the same process or manipulation is executed on the descendent colon and on the region occupied by the transverse and ascendent colon; on the cœcum; and at last, on the small intestine. It is with a certain degree of energy that such processes must be used: they consist in soft movements, in frictions directed to the deep-seated parts of the abdomen. This therapeutic and rational action is entirely

* Piorry, "Traité de Médicine Pratique," Paris, 1847, Vol. III., Nos. 4027, 4028.

founded on the anatomy. If you wish to see it effective, it is necessary to continue it for some time, and that an intelligent helper remain with the patient, in order to execute the movement. Often it procures the evacuation of a large amount of gas."

The above movement partly resembles a manipulation introduced long since in LING'S Medical Gymnastics, under the name of "*angular abdominal friction*" or "*colon friction*," alternated with concentric umbilical friction, which has been used, and with success, under the above circumstances, to restore interrupted or partially defective peristaltic motion, &c.

It was the anatomical foundation, alluded to by Dr. PIORRY, which procured for LING'S system the denomination of "the analytic method," an expression used by a critic on the writer's "Kinésithérapie," 1847. Similar reasons appear to have influenced Dr. DUCHENNE de Boulogne, in naming the Swedish method "une anatomie vivante."

116. Dr. PIORRY,* in speaking of the influence of respiratory movements in diseases of the lungs, tells us "that the lungs when affected with hypostatic pneumonia, hæmorrhagic engorgement of their posterior parts, have become, under the influence of deep and frequently repeated respirations, sonorous and elastic. Recent pulmonary congestions around tuberculous masses, under the same influence, have been observed to be at once in great part dissipated; from which fact is derived the material proof that the induration was in part caused by congestion. In cases of congestion, and even inflammation, repeated respirations may be followed by a very marked improvement in the state of these organs, and by a return to their condition of health." He has also seen remarkable amelioration in a tuberculous patient who had

* Dr. PIORRY has also related cases of epistaxis and lumbago cured by manipulations.

serious peritoneal effusion. Having made her respire deeply, many times in the course of the day, the fluid which was accumulated in large quantities in the peritoneum almost entirely disappeared in forty-eight hours. Dr. PIORRY has also ascertained, by *plessimetry*, that the heart diminishes in size under the influence of deep and accelerated inspirations. "By this means," he says, "we learn whether the heart is simply hypertrophied or dilated." ("Gazette des Hôpitaux.")*

117. Dr. PIORRY also recommends *cutaneous* frictions and dry cupping, as useful in asphyxia from accumulation of mucus in the bronchial tubes. Also, not to neglect the position of the patient, which he considers greatly to influence the facility of expectoration. (Mémoire sur la Respiration.)†

118. According to the same author, Dr. LURY D'ETOILES has proposed the use of pressure of the costal parietes in the asphyxia of drowned persons.

It has been observed in persons with obstructed and difficult breathing, especially after a supine position during the night, that ease, comfort and expectoration have been induced by deep inspirations (in a sitting position) followed by sudden passive expirations, produced as it were by the sudden sinking together of the body.

During the writer's studies in Paris, 1846—48, whilst following the *clinique* of Dr. PIORRY, at the Hôpital la Pitié, he witnessed more than once an experiment by which the great master of mediate percussion essayed to prove the importance of his art. It may also be mentioned as a proof —at least, the writer thinks so—of the direct and immediate transmission of the percussion to an internal organ. Dr. P.,

* "Medical Times and Gazette," Dec. 11, 1858.

† "Des Procédés Opératoires à suivre dans l'Exploration des Organes par la Percussion mediate," par Dr. PIORRY. Paris, 1835.

with his wonted talent, used to demonstrate, in cases of hypertrophy of the spleen; and after having drawn the contour of the organ on the skin of the patient, he gave a dose of sulphate of quinine. The medicine was hardly swallowed, and, in renewing the percussion, he demonstrated in the same manner that the spleen had considerably diminished, according to circumstances, about one or two inches. Dr. PIORRY announced the sulphate of quinine as the cause of this sudden diminution in the dimension of the organ. Not doubting that such effects may and often do result from the quinine alone, in reducing the size of the spleen almost instantaneously, at the same time, however, knowing the oftentimes quick absorptive action of percussion on internal organs, the writer has, in using the method of his illustrious master, ascertained the dimensions of the spleen before and after an immediate percussion; and in certain cases he has found a decided diminution of the organ from percussion alone.

119. Dr. TODD has an interesting report on the use of pressure at the temples, in the following case of epileptiform mania.*

"Whilst the patient, a woman, was being transported on a stretcher, her violent paroxysms were immediately stopped by a pressure which, quite accidentally, was applied at the temples. At this discovery a band was adapted round the head, with cushions at the temples; which procedure was followed with good result. Her son said that, when he was present, he was able by this means to arrest, or at least diminish, the intensity of an attack. The advantage," says Dr. TODD, "of a pressure round the cranium, which was manifested in this case, well merits our attention for some minutes. It is quite evident that the pressure diminished immediately the intensity of the attack; but how had it acted? Was it

* "The Lancet," Oct. 18, 1851.

in reacting against the probable state of softening of the encephalon, or in preventing the too rapid flow of the blood to the brain? Whatever may have been the *modus operandi*, the fact is well worth recording."

120. Dr. AUZIAS TURENNE observes: "Hemicrania (migraine) is a pain in the head, resulting from the compression of the facial nerve, and more particularly of its ophthalmic branch, caused by accumulation of blood in the sinuses on the base of the cranium, and especially the cavernous sinuses." By physiological reasoning, facts, and experiments, he has proved that certain positions of the head facilitate the flow of the blood towards the heart. "It is fully proved," he says, "that by paying attention to the position, direction, and inclination of the sinuses to their communication with each other, and with the veins outside the cranium, we can arrive at a precise knowledge of the position and movements calculated, in many instances, to prevent an attack of hemicrania, to render it less intense, and sometimes to dispel it altogether. I have never failed in obtaining the above results, when I have requested the patients to place themselves in certain positions, in which they could remain during an attack, without experiencing acute pains." Dr. TURENNE proposes, therefore, "borrowing means from Gymnastics," to obtain these effects by certain movements and positions of the head.*

121. Dr. STOLL recommends pressure of the head in headaches during bilious fevers, saying: "These fevers are accompanied by a peculiar headache, so painful that the patient feels as if the head were split in two. They are relieved by pressing the head between their own hands or by

* AUZIAS TURENNE, "Theory on the Production of Hemicrania," translated by Dr. BATEMAN. (From "The Lancet.")

some assistant, and often ask of themselves to have this kind of help."*

122. Dr. GUYON, in a paper read at the Academy of Sciences, relates that, during the epidemics of yellow fever, he found that the intense cephalalgia, which is an accompaniment to this affection, was greatly relieved by pressure on the temporal arteries. It appears from this interesting paper, that the native women are in the habit of using compression round the head.†

123. Dr. HENRY GUITRAC, Assistant Professor of Clinical Medicine at Bordeaux, has been making some experiments tending to prove that the dimension in the girth of the chest may be added to the other symptoms of pulmonary phthisis. He commenced his investigations by measuring the thoracic circumference in 140 individuals in good health, and then proceeded to a similar measurement in 80 cases of phthisis. He terminates his investigations with the following conclusions :—1st. That the chest of phthisical patients presents a circumferential measurement relatively less than that in healthy subjects. 2nd. That this diminution, observable at the outset of tuberculisation, increases with the progress of the disease, and may attain, during the latter period of the malady, an extent of six inches for the upper measurement (under the arms), of four inches for the central girth (across the breast), and ten for the lower part of the thorax. 3rd. That in the male the interval between the nipples gives an exact idea of the dimensions of the chest, representing the quarter of the central girth, and in adults measuring 7½ inches; seven and a quarter in the first stage of consumption, and six and three-eighths in the second.

* STOLL, "Med. Clin.," Avril 1776; "Traité des Effets de la Musique sur le Corps Humain," par LOUIS ROGER.

† "Medical Times and Gazette," June 11, 1864.

As a consequence of these observations, he thinks it highly advisable that a special exercise of the respiratory organs should be added to the ordinary measures of treatment. This exercise should consist in a dilatation of the thorax by graduated inspiratory efforts, and by such gymnastic movements as chiefly call into action the muscles of abduction.*

124. Whilst reference is being made to mensurations of the chest the following remarks will not be considered out of place:

Dr. LUSCHKA, 1871, Dr. A. VOGL, 1877, and Dr. H. BUSCH, 1878, have lately continued the observations on the dimensions of the chest, which were commenced centuries ago by celebrated artists—ALBRECHT DURER, LEONARDO DA VINCI, &c. Dr. VOGL has demonstrated that tailors, clerks, and persons of studious habits, show in general the smallest circumference of the chest—round the mammæ; that in the narrow-chested, the sagittal diameter is not so much diminished as the transversal diameter. Dr. BUSCH has paid particular attention to the importance of measuring the circumference at the level of the fourth rib, during different positions of the arms. He has found the circumference greatest when the arms are pendent to the sides, that it is less when they are kept in a parallel position near the head, and smallest in the position with the hands on the hips. His interesting pamphlet is in a condensed form with a number of statistical tables. Dr. B. has found that the circumference is less when the arms are lifted above the horizontal plane than when kept tolerably in a horizontal position.

At the mensurations which have been made at the Gymnastic Central Institution, it has been usual to bring the arms exactly up to a full perpendicular position near the ears, and to attend to the position of the head, that is, it being held differently to that of Dr. B.'s fig. III., a. b.

* "The Lancet," Oct. 18, 1862.

It ought also to be mentioned that in the mensurations made for gymnastic purposes since 1848,* a greater value has been attached to diametrical measure with callipers, viz., 1, a horizontal sagittal diameter at the level of the mammæ; 2, a transversal diameter at the same level, touching the pendent arms; 3, a transversal measure of the shoulders, made in such a manner that the points of the callipers fit in the fossæ omo-humerales, which are easily found, even on fat persons, if the arms of the person, whilst he is making a slight resistance, be moved upwards by the operator; 4, a transversal diameter of the trochanters, the feet being closed. The writer would also mention that since 1847 he has himself measured almost all the patients who have been under his care, out of which cases about 600 have been tabulated, with the view of controlling the results obtained during the kinetic treatment in various forms of chronic disease.† Only an ordinary tape measure has been used. The measures were taken at certain intervals during the course of the treatment, across the chest and shoulders, round the axillæ, and round the mammæ, where the inspiratory thoracic expansions were separately noted, and finally round the abdomen. The age, sex, as well as the height, weight, and dynamometric changes were also noted.

Although in many respects defective and insufficient as means of control, it is impossible to deny the importance of mensurations before and after a medico-gymnastic treatment. Even German writers on educational gymnastics recommend

* The measures with the callipers were then first commenced by Professor Ling, fils, and were continued till about 1862. The same formula for mensuration is adopted in the Gymn. reglem. for the Swedish navy, 1878.

† The writer has great pleasure in acknowledging the important aid he has received from his former assistant, Mr. John Holm, F.R.C.S., in respect of these tables, which by this gentleman have been extracted from the case-books.

them at present for healthy persons. They cannot substitute photos when it is the question of ascertaining an increased power to execute certain exercises correctly. In the meantime mensurations taken 1848 to 1850 at the Central Institution have confirmed the following facts, already before known there. 1. That a young person who has never before used gymnastic exercises can in a short time gain considerably more in circumference than in diameter. 2. That a small gain in diameter is durable; the circumferential increase, on the contrary, is liable to great diminution, even entirely to disappear. 3. A diametrical increase of half an inch at the shoulders, is of greater importance than an increase of a couple of inches in the circumference of the chest. The want of knowledge of these details explains partly the protests, which further on are mentioned as having been expressed, against the truthfulness of assertions as to effects produced by kinesiatric applications. However such doubts may be excused in everybody, who has not himself had the opportunity of observing how the same kinetic form is able, through apparently insignificant changes in the position of the body, to produce much or very little good result, nay, even to become injurious. Results which have been subjected to such doubts are, however, only obtainable by a method which is especially careful as regards selection and correctness of the positions in general, and especially in reference to those of the chest, the head, and the shoulders. It has been because of its aiming at such a strictness and precision, that this method has in Germany gained for itself the credit of "pedantismus and rigorismus," even in this respect. The majority of patients do not discriminate, especially at the commencement of the kinetic treatment, the difference in the execution of the movements. But there are some more sensitive, who are real touchstones (*pierres de touche*) as to the skill of the operators. Unskilful operators

provoke attempts to replace manual operations by artificial machines.

There is only space here to mention, *en passant*, the more or less complete mensurations which have been made by the late Major Rothstein and other highly distinguished German gymnasts.

125. Dr. V. GUTTCEIT, of Orenburg (Russia), has the following recommendation in phthisis pulmonalis. "Of all preventive measures in order to retard the development of the disease, I always consider the gymnastics of the lungs the most important. This consists in a methodical repetition of deep inspirations in the open air, and especially at such places as have pure healthy air, as in a garden, a forest, in meadows or open places, or on large sheets of water. The patient may be standing, sitting, or lying whilst making these inspirations, but must avoid them in active exercises. The inspiration should be made from five to six times in succession; after half an hour's rest it should be repeated; and in this manner performed four to five times in the morning, and as many times in the afternoon. The air-cells become by these means more than usually expanded, the whole lung more developed and made stronger."*

The writer has above attempted to elucidate some errors which still persistently remain in the conception of the term, specific movements. It has therefore been stated that a true method has proved that active movements are able so to be modified, *Gymnastico Modo*, that they can be made useful in producing relief even in the most severe forms of disease of the heart. This is now an established fact; though it is contrary to the opinion existing among learned physicians, who, from tradition, do not think of anything beyond climbing, jumping, running, swimming, dancing, when the word gymnastics and active exercises are men-

* "Dreissig Jahre Praxis-Erfahrungen am Krankenbett und im Arztlichen Kabinet," von H. L. Von Guttceit, Wien, 1875, 11 Theil, p. 36.

tioned. (See Dr. Liedbeck's Case, and the interesting report of Prof. Hartelius of cases of diseases of the heart further on.) It has also been pointed out that gymnastics, founded on scientific principles, possess means of procuring a great number of important "*exercises enginaires*," as little dangerous as many free exercises, though scientific persons still limit the former expression to represent rash and violent exercises, such as vaulting, "salto-mortales," and other "*exercises precipitants*," approaching the expression "*funambulisme*." It has also been mentioned that among the free exercises there are some often in use, which are generally considered innocent, but which are, however, more severe and more exciting as to their action on heart and lungs, than different movements in the group "*exercises enginaires*."

Here is again a case of a similar confusion of ideas found in the physician (deservedly esteemed by many as a man of observation), Dr. Guttceit. The above quoted experience of his, approaches nearly to the experiences which, at the commencement of this century, were collected at the Central Institution of Stockholm. As a proof of this assertion, it is only necessary to mention the many forms of "chest movements," of which descriptions are to be found in Dr. Neuman's writings, published in accordance with Professor Branting's oral lectures. Dr. Guttceit advises respiratory exercises for phthisical patients; he wisely adds that these exercises ought to be practised in different positions, but he will not unite them with any form of active exercise. This is evidently a reminiscence from the idea which connects with the expression "gymnastics" nothing but walking, running, dancing, playing at ball, &c. The following expression in relation to this subject is found in the "reglem for Gymnastics of 1836 (§ 459). "As a general rule, it is to be observed that in every person the strictest attention should be directed to the object of adapting the action of the movements to the development of the chest." This rule

holds good—*mutatis mutandis*—also for medical gymnastics, and certainly not less in relation to certain affections of the chest. But such a result could not be obtained by the old stock of exercises (walking, dancing, running, riding on horseback, &c.); a quite different "*tecnique*" and system required to be invented, which is supplied by the Ling movements (see Professor Hartelius' Descriptions),* which even if not complete, are quite equal to the books mentioned here in other places on the subject.

126. The late celebrated English surgeon, Sir WILLIAM FERGUSSON, made, during his last illness—Bright's disease of the kidneys, coupled with dyspnœa—the following interesting observation on himself:—"He found that by voluntarily increasing to the utmost the respiratory movements, *i.e.*, making forcible inspirations and expirations from fifteen to twenty times in succession, he could free himself almost entirely from the distressing sensation of breathlessness. Then gradually in the course of a minute or two after the cessation of the forced respirations, the former feeling of want of air returned, and he explained the temporary relief by suggesting that the deep inspirations had the effect of sending on a larger volume of blood highly charged with air."†

127. Dr. Ch. LOVÉN having referred to the "suction" on the surrounding parts being increased by deep respiration, and explaining thereby "the great use of certain gymnastic movements" (as, for instance, "chest-heaving," &c.) observes that, "in sedentary persons who suffer from a congestive state of the large venous trunks, an occasional deep inspiration is a powerful means to facilitate the circulation."‡

* Lärobok i Sjukgymnastik af T. J. Hartelius. 1870.

† "On Renal Asthma," by Dr. George Johnson. Braithwaite's "Retrospect," vol. lxxvi., p. 97.

‡ "On the Blood," op. cit.

128. In addition to the benefit of free exercises in the open air, says Dr. THOMPSON, much good would, I believe, follow from attention to the power with which the will is endowed over the respiratory muscles. I cannot but think that some of the evil incident to intense study might be obviated by occasionally pausing to practise breathing.*

129. Dr. E. DALLY has lately considered it necessary to point out the importance of the old rule of respiration in general, viz., to inspire by the nose, and expire by the mouth.

130. Dr. LOMBARD in 1868 has observed that increased inspirations produce at first increased, and afterwards diminished pulsations of the heart.

131. Dr. BERKERTI has an interesting paper in the *Lancet* on the treatment of emphysema of the lungs by artificial expiration.†

132. Mr. EDWARD DE MORGAN has made some interesting deductions on the medical value of arterial pressure, when experimenting with the sphygmograph. "Let us assume," he says, "that pressure be applied on both axillary and femoral arteries, then, roughly speaking, about half the blood in the system, or greater circulation, is withheld; the remainder returns to fill the left ventricle of the heart, which either contracts upon half its normal amount of blood, or delays its contraction until sufficient blood has returned from the unobstructed vessels to distend the heart to its normal contracting volume. If the latter of these two alternatives were the case, the pulse would be diminished in frequency, and its fulness greatly increased. It may at once be

* Dr. Thompson, "Diseases of the Chest," *The Lancet*, Dec. 13, 1856.

† *The Lancet*, Nov. 25, 1871.

ascertained by pressure on a femoral artery that there is no alteration in frequency, and the sphygmograph shows that there is no increased tension in the radial pulse when the femorals are compressed. Hence it follows that the left ventricle contracts upon half its normal quantity of blood, and that the right ventricle contracts upon half its normal amount of blood, and that the area of the pulmonary or lesser circulation being undiminished, the pulmonary artery contains but half its normal amount of blood, and thus it follows that the blood speeds through it less rapidly, and pressure within its walls is greatly diminished.

Mr. De M. proposes to apply his theory in three different sets of cases:—

1. (*a*) Hœmoptysis in consumptive cases.

(*b*) Hæmorrhage from wound of lung.

2. On the supposition that damming back venous blood from the lungs would diminish the necessity of oxygenation.

(*a*) Spasmodic asthma.

(*b*) Emphysematous and cardiac dyspnœa.

3. As a direct dry cupping of the lung in inflammatory diseases.

In Class I. he intimates that he has had but slight experience, there being little hæmoptysis in South Africa. In the case of bullet wounds in the left lung, pneumothorax and hæmothorax present in a great degree, axillary pressure gave immediate relief to the dyspnœa.

In Class II. pressure had been applied in five cases, with immediate relief to dyspnœa in all. Two interesting cases are related.

In Class III. Mr. M. thinks that gentle pressure on the femorals might be serviceable in intractable catarrhs of the apex of the lung in phthisical people. Mr. De M. further observes, stoppage of epistaxis by elevating the arms, may be due to the same cause by compressing the axillary arteries. "This would act, I imagine," he says, "by facilitating the

return of the blood through the superior vena cava. If so, digital compression would be better. This is rendered probable by the arrest of hæmoptysis by tying up the arms of consumptives. My friend, Dr. Grabham, of Madeira, whose experience is large, told me that he often treated hæmoptysis in this way with success."*

The writer has seen Ling in his practice (1829-39), use with advantage compression on the axillary arteries as well as on the radial arteries in dyspnœa, hæmoptysis, &c. In any case Mr. De M.'s observations are valuable, as inviting to further researches on the important subject of blood pressure.

133. In an important article on the thorax† in 1852, Dr. HUTCHINSON has opened up a new field of physiological research in relation to the respiratory phenomena. By his introduction and use of the spirometer, he has been the first to attempt to determine the vital capacity of the lungs in man in relation to height and weight.

134. Professor PANUM, of Copenhagen, has in 1869, through the means of experimental physiology, brought to light some interesting facts which give a new elucidation as to the effects of different positions of the body on the respiration in certain pathological conditions. An important part of the results he has obtained may be comprised in the following general propositions. A person in a reclining position is breathing with the lungs less filled than when sitting, and in asitting posture less than in a standing one. This seems to tally with results obtained by other observers as to the condition of the pulse in these three positions. It has been remarked already by Ling that patients often prefer certain "*diagnostic*" positions—differing in different morbid conditions—as, for instance,

* "The Medical Value of Arterial Pressure," by Edw. de Morgan, District Surgeon, Queenstown, South Africa.

† Art. "Thorax" in Cyclopœdia of Anatomy and Physiology. Edit. by Rob. Todd, M.D. London, 1852. Vol. IV.

supine position, with and without drawn-up knees, right or left lateral position, prone position, the arms placed above the head, &c. In other cases, well known to every medical man, the patient is obliged to adopt a sitting position with different degrees of inclination of the body, or to find a support for the elbows, the forehead, &c.*

135. Professor CH. LOVÉN has made the observation in 1872 that a quantity of air is *moved* in and out of the lungs, whilst another quantity of air remains, *the amount of which* depends on different positions of the body. Professor L. has besides, in a novel manner, commenced a series of experiments, the continuation of which no doubt will result in a clearer scientific *explanation* of some of the more important *empirical* rules in gymnastics. The apparently pedantic rules which are adopted in the Swedish gymnastics, in order strictly to determine certain positions considered to be of importance, especially in relation to head, chest, and shoulders (see above), seem, however, not to tally with the striking results which Professor L. has communicated as to the "vital middle position of the lungs" in two different positions, sitting in an erect, or in a crooked position (forwards bent).

The assertion that a considerable forwards bending of the head favours an increase of the quantity of air contained in the lungs, appears to be in opposition to the usual precepts in gymnastics, which aim at avoiding such a position, as rather tending to diminish the expansion of the chest. This apparent anomaly Professor L. has himself observed. Many a practical gymnast will have difficulty in understanding that the lungs should be able to contain more air whilst the head is bent forward, and the upper part of the sternum lowered,

* It is to be observed that the expression "supine position" embraces some postures of the body which produce different effects on the respiration, viz., stretched on a hard board, sinking down in a thick soft feather bed, or being pent up in a hammock, &c.

than when, as in the backwards bending of the head, the upper middle part of the thorax is raised. The conclusion to which Professor L.'s researches have led is contained in the following: "*The vital middle position of the lungs is determined in a great measure by other causes than the external mechanical arrangements, be they favourable or unfavourable for the respiratory movements, which are directly dependent on the different positions of the body.* However it cannot be denied that even these positions may exercise an important influence in the above sense."*

The writer may be permitted to observe :—1. That it is a known fact that spirometrical experiments depend much on practice; as repeated exercises in making deep inspirations and expirations increase their force. 2. In gymnastics it has been found that age is not the only factor exercising a great influence on the varying power of breathing in different positions. The differences are in general less notable in a powerfully developed person with a large chest, in the following positions: standing erect, "attention," standing at ease, astride-stoop-sitting, crook-hanging, tense-bend standing, &c. 3. "The erect attitude of chest, neck, and shoulders," which in gymnastics is considered to contribute to a *typical middle position* of the lungs, deviates considerably from the resting position, in which the usual abdominal quiet and deep respiratory movements take place in a healthy person. The former position diminishes no doubt the distance between the extreme limits of inspiration and expiration, as it determines a diminution of the *movable* quantity of air, at least comparatively to the volume of air which remains in the lungs during such a condition. But the former fully active

* "Researches on the Vital Middle Positions of the Lungs," by Dr. Chr. Lovén, *The Northern Medical Archive*, Vol. IV., No. 2. The writer regrets that in the short and incomplete account which he has given of Professor Lovén's valuable article he has not been able to do full justice to the important research it exhibits.

middle position is considered to keep the air vesicles distended, or less "*collabirt*," and consequently increase their respiratory surface, that is, causes a quicker and more complete interchange between the sanguineous fluid and the air. Dr. BUSCH has confirmed that the upper part of the lung is only filled by a more complete respiration, through the movements of the upper ribs and sternum. It has besides often been observed by Mr. LING fils, at the rough experiments made at the Gymnastic Institution at Stockholm, that persons with delicate lungs are obliged to breathe more often in contracted positions than in such a position as allows free expansion of the chest. It appears possible that these circumstances may in themselves contain means of compensation, which, however, allow the existence of yet others of similar character.

A fact connected with this subject should be mentioned here, viz., that persons in dyspnœa never select a position which favours a strong and complete expiration, but rather one which facilitates inspiration—a fact in itself not easy to explain. Some analogy may be found in the gymnastic movement, "*Heave standing chest tension*" (Neuman, fig. 40), a movement in which, if correctly made, the inspiration is carried nearly to its highest pitch by the elevation of the thorax, but expiration, on the contrary, is very limited, on account of the thorax being fixed whilst in a high degree of expansion.

It is to be hoped that Professor LOVÉN will continue his interesting experiments in the same direction as hitherto, and thus more and more approach such questions as will, in the interest of a rational gymnastics, further elucidate other points of animal mechanics.

136. To return once more to the researches of Dr. LOVÉN "On the Vital Middle Position of the Lungs."* As mentioned in the

* *The Northern Medical Archive.*

previous Article, they are in themselves of great value, and are once more referred to because they touch upon questions of essential importance, as elucidating some characteristic effects of a certain class of important movements.

In the already mentioned publication ("The Blood, &c.") attention is called by Professor LOVÉN to direct experiments instituted in order to find the degree of pressure in the vena cava, in different positions of the body. The above venous trunk is, according to him, not only shortened, but even less in volume during a strongly forward bending position of the body. The vein becomes, however, not only elongated, but obtains also a greater cubic capacity at the raising of the body.

These observations are confirmed by the more intense and visible colouring of the face, and the turgescence of the superficial jugular vein, &c., during the former position. It is also so understood in accordance with its use in gymnastics. Dr. L. mentions further that if the stretching of the body is carried on to a *bending backwards*, the cubic capacity of the vena cava is still more increased, and consequently also the suction from the venous trunks of the extremities. This rule seems to correspond with the explanations adopted in our gymnastic system, only, however, on condition of the bending being very slight indeed. It has mainly been considered among the gymnasts of the Swedish school, that in a stronger bending of the body backwards, the position called tense-bend standing (Regl. for the Sw. Navy), or stretched arch-standing (fig. 82, 27), the abdominal walls do exercise a considerable pressure on the vena cava inferior. This has been *explained* as being the cause of the injection to the face and eyelids, as well as of the turgescence of superficial veins of the neck, even in this position, as well as in the strongly forwards bend position, as above mentioned. It has even been maintained that the bending backwards (one of the oldest and most important forms) produces a

decided action on the spinal cord, not only immediate, but also by pressing a quantity of blood in the many small plexus venosi of the spinal canal. (Compare Dr. NEUMANN.)

Here is the place to observe that it has been found necessary in making a classification of the Kinetic repertory, to adopt two separate kinds of abdominal pressure ("Bauch presse"), the one *active*, occurring, as for instance, in the crook-hanging position, the fall-sitting position (fig. 24), exoneratio alvi, &c.; the other *passive* (or more ligamentous) in bend-standing position. In speaking of the hæmostatic state of the great vessels, the writer is glad to avail himself of the permission to mention here an experiment made by Prof. LING, fils, in 1868.

The experiment was made at the dissecting room at the Gymnastic Institution at Stockholm, in order to show how far the old gymnastic explanation as to the hæmostatic action produced by a sufficiently strong backwards bending of the trunk was in accordance with the adopted explanation as to its effects. A glass tube, connected with a perpendicular one of gutta percha, was introduced into one of the carotid arteries of a corpse which was attached to an apparatus in order to hold it in an upright position with vertically extended arms. An injection of water was then made in the crural artery in sufficient quantity to appear at the mouth of the gutta percha tube. The body was then bent backwards, as in "Gymn. Regl. of 1836," pl. i., fig. 17, and Rothstein's "Rüstübungen," 1855, pl. ii., fig. 57. Every time this movement was repeated, a strong jet of water was thrown out of the tube.

It is to be regretted that during the present organization of this institution, instead of encouragement being given to the continuation and further enlargement of the field of anatomical and physiological research (especially in animal mechanics, which was one of the original aims of the institution), such researches have been altogether

discontinued. Compare the writings since 1849 of Dr. REIMER, Messrs. MASSMAN, LION, &c., who criticized this manner of obtaining knowledge in materia gymnastica. It would rather have been expected that this kind of experiments should have increased at the Central Institution, when, as at present, physiological research has elsewhere taken this very direction. But this is unfortunately not the only direction in which the institution is falling short of its original design.

Among the different positions and movements, except ordinary walking, which have been adopted in the LING gymnastic practice, the following may be mentioned* as having in their practical application special hæmostatic influences, viz., the arch-standing position, the stretch-arch-standing position, the deep-stoop-standing position, the tense-bend-standing position, the arch-hanging position, the crook-hanging, the fall-sitting, the heave-standing position, the crook-stride lying position, with both knees up-pressure, &c.† It would be to be desired that physiologists, *ex professo*, who employ other means, and more perfect methods than gymnastics only, in the exploration of the hæmostatic laws, would select some, if not all of these positions, as objects of their careful investigation.

137. The late distinguished surgeon, Mr. SYME, in his lecture "On Popliteal Aneurism," mentions an experiment by Dr. JOHN REID, showing the effect of muscular action upon the blood vessels. "A dog whose femoral artery was exposed, while the force of the blood was measured by a bent tube

* Compare the Manual of Kinesiology, by Prof. HG. LING, p. 304.

† See "Regl. Gymn.," 1836; pl. i., fig. 17, 18, Rothstein Rüstübungen, pl. ii., fig. 57. Björnstad Haandbog, fig. 17, 30 Regl. for the Navy, 1878, fig. 24. On the last position, though at least formerly almost in daily use, there is, unfortunately, neither descriptions or figures.

containing mercury. It was very striking to observe that when the animal struggled the mercury rose in the tube, and fell again as it became quiet."*

The effect of the force of the blood pressure in different movements and degrees of effort is a question which, for gymnastic purposes, it is of great importance to get scientifically decided. (See pp. 112, 114, etc.)

138. Dr. CRUVEILHIER, in his "Anatomie Pathologique," speaks of treating tetanus by a continued voluntary rhythmical breathing. He says, "I placed myself before the patient, and I engaged him to breathe after a certain rhythm, making forced inspirations as deep as possible. In order to direct him in this fatiguing exercise, I commenced to beat the rhythm before him in two tempo.

During one hour that I remained with him there, no fit of suffocation took place. I made assistants replace me, who in rotation were relieved by others. At the end of four hours the patient fell into a deep sleep. When he awoke the same means were recommenced, and followed by the same result. This exercise being suspended, there occurred some exacerbations which soon, however, ceased. The patient was perfectly cured.† (See further on, Dr. BOWVILL'S "Observations on the anæsthetic effects of repeated rhythmical breathing." Also the Appendix on Dr. SYLVESTER'S breathing-method.)

139. SIR JAMES PAGET, in his classical work "On Surgical Pathology," instances several important points illustrating the physiology of our subject, of which the writer here only notes the following:

Page 89 he says: "Persistent extra pressure on a part always appears to produce atrophy and absorption; occa-

* "Lectures on Clinical Surgery," by JAMES SYME, Esq. — "The Lancet," Feb. 10, 1855.

† "Anatomie Pathol.," t. i., p. 153.

sional pressure may, and usually does, produce hypertrophy." As regards the consequence of exercise of function on nutrition, he observes that "when a part is, within certain limits, over-exercised, it is over-nourished; so if a part is used less than is proper, it suffers atrophy." He points out that "in atrophied muscles corresponding atrophy of the nerves is to be found; that the condition in which atrophy of the voluntary muscles most commonly occurs is in inaction. Where the muscles are paralyzed through an affection of the nervous system, we ought to give them artificial exercise." . . . "You will find this suggestion ingeniously supported," he says, "by my friend, Mr. W. F. BARLOW, in a paper published by him in the "Lancet." In one case in which I could act upon it, the result was encouraging. A little girl about eight years old had angular curvature, and complete loss of voluntary movement in the lower extremities. This had existed some weeks, but as I found she had reflex movements, the legs twisting in a very disorderly way as often as the soles of the feet were touched, I advised that the limbs should be put in active exercise for about an hour two or three times a day by tickling the feet, or in a similar way. The result was, that when several weeks afterwards the spinal cord recovered, and she could again direct the effort of the will to the lower limbs, the recovery of strength was speedy and complete."*

140. Mr. STURGES JONES, M.R.C.S., mentions a case in which a fourpenny piece having slipped down the trachea,† he says: "remembering the case of Mr. BAUD, I simply laid a cushion on the floor, and placing the patient on his head, with the aid of my assistant suspended him by his

* Lectures "On Surgical Pathology," by JAMES PAGET, F.R.S. London, 1853. Vol. i.

† STURGES JONES, M.R.C.S., "Removal of a Coin from the Trachea."—"The Lancet," Oct. 30, 1858.

legs, at the same time violently striking him several times on the back, between the shoulders, with the palm of my hand. In the course of two or three minutes, during a slight fit of coughing, the coin was dislodged, and fortunately expelled from its perilous position.

141. Dr. GRAILY HEWITT recommends friction of the chest in the treatment of apneumatosis (lobular bronchitis) in children. The friction was frequently repeated with sweet oil, with the object of promoting the expansion and movements of the chest, and the consequent filling of the air-cells with air, by which also the mucus was removed from the tubes.*

142. Dr. LAFARGUE publishes in the *Gazette des Hôpitaux* an important paper on a case of strangulated hernia, which he succeeded in reducing by placing the patient entirely head downwards, and then kneading the abdomen.† (See Dr. LIEDBECK's case, further on.)

143. Dr. GOSLIN read a paper at the Academy of Medicine on the *taxis* in strangulated hernia. He recommends its forcible and prolonged employment. He commences with gentle pressure, and at the end of five or six minutes he increases the pressure, using both hands, leaning over the patient with the weight of the body, and sometimes causes the hands of a powerful assistant to be placed over his own, calling it "taxis a quatre mains."‡

144. Dr. RECAMIER, of Paris, had introduced in his practice in about 1846 (according to a French medical

* "On the Pathology and Treatment of Bronchial Affections in Adult Age and in Childhood," by GRAILY HEWITT, M.D.—"Lancet," Dec. 6, 1856.

† "The Lancet," Juli 30, 1859.

‡ "Med. Times and Gazette," Nov. 12, 1859.

journal), a movement which he called "Massage cadencé," which he recommends as preferable to any other means, in cases of prolapsus and fissure of the anus.

145. Mr. ROBERTS, as it appears, never requires division of the sphincter in fissure of the anus, but recommends Dr. RECAMIER'S method in the majority of cases. To overcome the violently contracted muscle RECAMIER operated thus: He introduced the index finger of his right, and then of his left hand into the anus, and forcibly separated the sphincter, until the contraction of it had ceased. Mr. ROBERTS adds that he has performed this operation a great number of times, and has never known it to fail. The consequences are very simple, and no dressing is required after it (L'union Medicale).*

146. Dr. MAISONNEUVE, of Hotel Dieu, makes use of the same operation. He says that "in what we call fissured anus the contraction of the sphincter is the real disease, and the fissure of only secondary consideration, and the treatment adopted is to pass two fingers into the rectum, and to stretch the sphincter to a great extent. The operation produces some ecchymosis and painful paralysis for a day or two, and no doubt cures by rupturing some of the fibres of the sphincter. It is painful, and the pain continues for a short time after the operation." †

147. Dr. CANZLER cured an obstinate cramp in the hand while writing—"Scrivener's palsy"—by the daily application of gymnastic exercises, by which the extensor muscles of the arm and hand were put in action, whilst the flexors were left entirely in a passive state. In some months the patient was cured of this disease, which had continued for a year. ‡

* "Medical Times and Gazette," Jan. 8, 1859.

† Ibid., Oct. 24, 1863. Notes on some of the Paris hospitals.

‡ Vierteljahrschrift für die praktische Heilkunde, 1848, vol. iii., p. 76.

148. It is in itself noteworthy that filing, repeated and continued for some time, as in the case of Mr. C. O. STRINDBERG, a merchant in Stockholm, has cured cramp caused by writing and trembling of the hands, but it becomes the more so when reference is made to the experiment of Mr. ROODE (Poggendorff's annalen), with a view of ascertaining the effect of intense vibrations of a rotating cylinder, with an eccentric axis, making fifty to sixty turnings in the second, by which manœuvre cramp-sensations were produced.

149. Drs. TROUSSEAU and PIDOUX,* in reference to gymnastics, have the following lines: "The exercise of the locomotive muscles, says BROUSSAIS (Proscrit., 373, Ex. des doct. tome i.), is the best means to destroy convulsive mobility. It acts by displacing the irritations of the several viscera (the vicious latitude which BROUSSAIS gives to the word *irritation*, will permit us to use it as synonymous with pains, with spasms, in a word with neuropathy), *by using up a superfluous activity*, and by drawing the forces towards the nutrition and towards the exhalent and secretive tissues."

"This proposition contains a deep truth, too much forgotten or despised by physicians, who seem to disbelieve in the completeness of such cure, and who would think themselves professionally dishonoured, if they had cured without pharmaceutical aid; a truth also forgotten by the patients, who do not value their doctor when he is sufficiently conscientious not to fill them with drugs; who think that in such case he sees nothing in their illness; that he is inattentive; or that he despairs of a cure should he look exclusively to the resources of hygiene for his curative means. Great perseverance in habitual physical exercises, and well-directed gymnastics, are the only tonics useful in convulsive and spasmodic hysteria."

"Tonics of this kind are perhaps the only ones that agree

* "Traité de Therapeutique," vol. i., p. 82, and following.

with hypochondriacs." In the same work we find (p. 833—837) the article "On Massage," which is divided into massage by pressure and massage by percussion; in which these different manipulations are described, and indications for their therapeutic application mentioned.

150. Dr. RADEMACHER,* mentioning a popular remedy for relaxation of the uvula, raises the question "whether, in the majority of cases of medicines in use amongst the people, these were not at first introduced by physicians of the ancients, and afterwards, having been either forgotten or rejected by their successors, have remained amongst the people in a traditional state; or if, on the contrary, these ancient physicians received them from the people, gave them Latin names, and promulgated them as their own discovery. If the resolution of this question is possible, it belongs to history." Dr. R. says: "That in the country where he had received his first scientific instruction, there lived an artisan, who had a great repute "*for raising the uvula.*" He took a handful of hair at the top of the head of the patient, and drew it strongly upwards so that the patient felt considerable pain. This process used infallibly to cure the malady. To my juvenile and non-medical mind this treatment appeared at that time irrational; how much was I not astonished afterwards to find this same cure by traction, in the works of a physician of great renown, of the fifteenth century, Bartholomæus Montagnana (concil. 88). After having recommended dry cupping over the sutura sagitallis, he thus continues: Violenter etiam sursum attrahantur capilli ejus (the patient) ita, ut cutis capitis exfolietur a cranio suo: per tale enim ingenium statim uvula mirabiliter sublevetur. Vidi ipsum fieri et instanter profuit; sed non debet fieri nisi in casu arduo magnæ suffocationis."

* A justification of the Medicine of Experience of the Spagyristes, etc., by Dr. J. G. RADEMACHER. Vol. ii. p. 41.

151. The same author, Dr. R.,* relates the history of a man, already old, who having suffered for some time from abdominal fullness, eructations, &c., was attacked by violent colic, and after having tried in vain internal medicines for the intestines, asked in despair that a napkin should be bound very hard round his abdomen. From the moment the knot was tied all pains ceased as by a charm. "I well understood," says Dr. R., "that this mechanical remedy could only cure if the colic were caused by biliary calculus; by quickly tying the knot a sharp stone must have been displaced, and by this means the irritation of the biliary vesicle lessened and dispersed."

LING mentions the fact that General, Count S., by riding in a carriage, procured by its shaking immediate relief in a kidney affection (renal calculus?) from which he was suffering. Ultimately the patient, having a strong constitution, got rid of his malady, thus preventing an operation which had previously been considered inevitable.†

152. Dr. RADEMACHER also mentions a case of intense colicky pains with vomitings in a lady, in which case all the usual internal medicines having failed, he caused circular frictions to be applied on the abdomen for about half-an-hour, when all pain had ceased, improvement having commenced after the first fifteen minutes. The doctor attributes this happy result more to the frictions than to the embrocation which was used in conjunction with them.‡

153. A cure of Intussusception by injection of water and inverting the body is mentioned by Dr. WARREN PAY. A child seven months old cried at every movement of the legs, had constant tenesmus, and passed only blood and

* Oper. cit.

† LING's Introductory Speech in the Swedish Academy, p. 47.

‡ Oper. cit.

mucus. The intussusception could be reached by the finger in the rectum. A large quantity of tepid water was injected into the rectum, whilst the child was held by the feet with the head downwards. The child seemed livelier as soon as the water had passed away, and was the following day quite well.*

154. Mr. BOWMAN, F.R.C.S., mentions a case of hernia, in which reduction was assisted by placing the patient on his head ("Med. Times and Gazette," Feb. 2, 1861).

155. Dr. PHARES has, in the *Transactions of the Mississipi State Medical Association*, directed attention to the mechanical treatment of colic. This consists in simply supporting the patient in an inverted position, or in other words, in placing him on his head. Cases attended with intense pain, and which have resisted all ordinary treatment for hours and days have by this simple means been cured in from one to five minutes. "Relief is sometimes obtained by the knee-breast position," or by means of the thighs and legs extended across a high bed or table, the arms and hands being free to assist in giving support to the head. But the complete inversion is the most sure and prompt remedy. The success depends on the escape, or of a change of the position of the gases in the bowel.†

156. Dr. RADCLIFFE says: "Gymnastic exercises are very beneficial in the great majority of chronic convulsive cases. He further observes: "It would even seem as if pain must give place for a time to the feverishness produced by exercise. At any rate I have more than once found tic doloreux pass away, as soon as I could set my blood fairly in motion by

* "The Lancet," No. 17, 1875, "Allgemeine Homöopathische Zeitung," Vol. 97, No. 8.

† "London Medical Record," Oct. 15, 1878. "The Practitioner," December, 1878.

violent bodily exercise; and on two occasions I have derived a similar benefit from a practice which is not infrequently adopted in the hunting field, and put an end summarily to a sudden attack of lumbago, by leaning forwards in the saddle and beating the loins with the two hands until the whole body was aglow, and perspiration dropped from the forehead."*

The writer has in numbers of cases cured lumbago with what in the gymnastic nomenclature is called "lumbar percussion," applied to the patient, who remains all the time in a passive state, generally standing or sitting.

157. Dr. HUGHES BENNETT commenting on the necessity of keeping the muscular system in a sufficiently active condition, observes the fact "that thereby a constant pressure on the veins is kept up, and the return of the blood secured. In connection with this important influence on the circulation, we must consider its effects on the respiration, the condition of the blood and nutrition generally, and through that, on animal heat." . . . "Its benefit in different kinds of distortion in the young is unquestionable." Dr. H. BENNETT recommends also active exercises in dyspepsia, in cachectic maladies, and in cases of paralysis.‡

158. In diagnosis and treatment of paralysis Dr. RADCLIFFE observes: "I am also disposed to ascribe some part of the credit to the localized movements and kneadings. I do not pretend to decide as to the precise amount of credit assignable to these agencies, but this I may say, that in cases of muscular atrophy, and in cases of paralysis, the progress

* "The Lancet," Juni 6, 1863. "Course of Lectures on certain Disorders of the Brain and Nervous System," by C. BLAND RADCLIFFE, M.D.

† Ibid., Juli 18, 1863.

‡ "Clinical Lectures on the Principle and Practice of Medicine," by JOHN HUGHES BENNETT, M.D., p. 323.

towards recovery will be more tedious and unsatisfactory if these processes are not included in the plan of treatment."*

It will not, perhaps, be out of place here to acknowledge the compliment paid to LING by Dr. RADCLIFFE in proposing to call LING'S curative method after its inventor, *Lingism*, in itself a significant proof of appreciation on his part of the Swedish medical gymnastics.† In order to show that this homage is not the only expression of the kind the following two documents are appended:—

159. To the late Medical Councillor, Dr. U. SONDÉN, of Stockholm, belongs the honour of having first publicly called attention to LING'S system abroad. At a meeting of Scandinavian naturalists held at Copenhagen in 1840, he read a paper on the subject.‡ Having been a pupil of LING, he had an early opportunity of examining and appreciating the scientific value, and witnessing the benefit of the practical application of his system, at the Central Institution at Stockholm. In his paper he says: "So far as we have touched upon the *modus operandi* of the medical gymnastics, three principal modes of action will be remarked, viz., *excitation*, *derivation*, and *roboration* (strengthening), though these are by no means the only ones. It can therefore be employed in all those diseases, where any or all of these actions are required; and it is not too much to allege that their application will be of use in the greater number of chronic diseases; viz., *affections of the nerves of every description*, *rheumatism*, *marasmus*, *profluvia* and *suppressions*, *dyscrasias*, *disorganisations*, as well as *diseases of the skin* and *chronic inflammations*, perhaps, indeed, it is only contra-indicated in acute

* "The Lancet," June 14th, 1865.

† Lectures on Epilepsy, Pain, Paralysis, etc., by C. B. RADCLIFFE, p. 332.

‡ A Lecture on "Gymnastics as a Branch of Education and Medical Science," delivered at a meeting of Scandinavian naturalists, July 8th, 1840. By C. U. SONDEN, M.D. Stockholm. Pp. 30.

inflammations and fevers. Medical gymnastics are, in fact, applied to the extent above indicated at the Central Gymnastic Institution of Stockholm, and a very large number of persons have to thank this treatment for their health; and we think it a duty to mankind at large to do our best towards spreading a knowledge of this great and successful system, so beautiful in theory, so eminently useful in practice, which merits a better fate than to be buried in a distant corner of Europe."

160. In consequence of the energetic and successful attempts of Mr. DE RON, a pupil of LING'S, to establish the Swedish gymnastics in Russia, the following extract from the report of the College of Physicians of St. Petersburgh may be of interest: "The College of Physicians had deputed two of its members, the Councillors of State Drs. SPASSKY and SAGORSKY (the former of whom had himself undergone the treatment in the institution of Mr. DE RON), to make a careful investigation of this system. These gentlemen, after a full and very minute examination, gave in their report; and the College, after due consideration, came to the following conclusion: viz., that LING'S gymnastic system should take precedence of those attempts hitherto made to establish this practical science in various countries; and that LING should accordingly, without doubt be acknowledged as the founder of rational gymnastics, he having established an institution, in which those who desire to devote themselves to practising this art might have an opportunity of acquiring the requisite practical and theoretical knowledge of the movements of the human body; and also a full and extensive knowledge of anatomy and physiology, which in LING'S system form a principal part of the gymnastic studies. LING has thus laid a durable foundation for this important branch of education. We should also add, that LING and his successor at the institution of Stockholm, have lately more particularly employed themselves about the method of curing various diseases by

movements, based on the physiological fact that different bodily exercises increase and strengthen the muscles acted upon; and that they must, therefore, not only cure certain abnormities in the muscular system, but must also, by causing a free circulation of the blood in various parts of the frame, remove congestion; or, on the contrary, by an increased supply to various organs, modify their nutrition, and consequently the functions dependent theron; or, in one word, produce on the organisation many very important effects," etc.

The College of Physicians further refers to the statement of Dr. BOGOSLOFFSKY as deserving the most particular attention, he having himself not only been cured by this mode of treatment, but now "for the last five years as consulting physician at the Institution, having followed the treatment in upwards of 1,000 cases."

The College of Physicians concludes by expressing its wish that the Russian Government would pay particular attention to LING'S system as an important branch of education; and take some steps towards its further propagation by means of properly educated professors; for the accomplishment of which the College strongly recommends the establishment of an institution as in Sweden, where students may obtain a thoroughly practical and theoretical knowledge of this valuable science; and where skilful assistants may receive proper instruction; and above all, where medical men can have an opportunity of making themselves thoroughly acquainted with gymnastics in general, but more particularly with the medical branch which, as an important part of therapeutics, according to the College of Physicians, deserves the most particular attention of the medical profession."

161. Dr. WEST mentions gymnastic exercises as a method of treatment which has been strongly advocated in cases of chorea. In paralysis in children Dr. W. also recommends from the very first that attempts be made, by the

regular employment of passive exercises, and by frictions of the limb to prevent that wasting of the muscles which is sure to follow long-continued inaction. In epilepsy reference is made "to the good results which I have heard follow the introduction of gymnastic exercises among epileptic patients at the Bicetre in Paris."*

162. The following extract is made from Dr. FORBES WINSLOW'S interesting work on "Obscure Diseases of the Brain.† "It is a well established fact," he says, "that idiocy, apparently irremediable, connate imbecility, has been cured by a blow upon the head."

"A child up to the age of thirteen was idiotic, giving evidence either of a total deficiency of intelligence, or of a stunted intellect of the lowest grade and order. He fell from a height upon his head and was stunned. He rallied from this state of unconsciousness, and was, *credat Judæus*, found to be in full possession of his intellectual faculties. A somewhat similar case is recorded by Lawyer Villermay. A man suffered from a paralysis of memory, following a severe blow upon the head. He was fortunate enough, as the result established, to have a repetition of the physical injury, and, as the effect of this accident, his memory was immediately restored to its original strength (Dictionnaire des Sciences Medicales," vol. xxxiii., p. 321). Petrarch records that Pope Clement VI. found his memory wonderfully strengthened after receiving a slight concussion of the brain."

163. "It appears," says NELATON, "according to Gama, that Father Mabillon, who was in infancy of a very weak intelligence, was trepanned after a violent fall, and became, after the operation, the orator whom history celebrates. The

* Lectures "On Diseases of Infancy and Childhood." By CHARLES WEST, M.D. Third Edition.

† Dr. FORBES WINSLOW "On Obscure Diseases of the Brain and Mind." Second Edition. London, 1861.

same author quotes also the case of a madman, who owed the return of his reason to a violent commotion of the brain." (See page 41.)

Dr. NELATON, among other remedies, in cases of traumatic affections of the head (commotions of the brain) recommends frictions over the whole body, and especially on the precordial region.*

164. "I have been informed," says Dr. PRICHARD, "on good authority that there was some time since a family consisting of three boys, who were all looked upon as idiots, one of whom received a severe injury of the head; from that time his faculties began to brighten, and he is now a man of good talents, and practises as a barrister. His brothers are still idiotic and imbecile.†

165. This case brings to the writer's memory a case of hypochondriasis in an old Finnish gentleman, in age about 50, who, among other symptoms of great mental depression, was highly timorous. It is to be supposed that this symptom led LING, who directed the treatment, to choose the following passive movement among the several active and passive forms which constituted the treatment. The patient was placed about as in the Fig. 91. (Dr. Hartelius, Handbok i Sjukgymnastik), but standing instead of sitting, with his feet along the edges of a balancing board, being thus held by two assistants, each by one hand. The patient being in this position, an assistant lifted one end of the board from about one foot to one and a half from the floor, when it was suddenly dropped in order to produce a sudden but mild concussion to the cerebro-spinal centres. After some months' treatment the gentleman was restored, and soon afterwards married.

* NELATON, "Elements de Pathologie Chirurgicale," t. iii., p. 495.

† "Treatises on Diseases of the Nervous System." By J. C. PRICHARD, M.D. 1822.

166. Dr. BROWN SEQUARD has, in a lecture, maintained that persons having had a blow on the head, and subject to fits (epileptic) for many years afterwards, may often be cured by blistering on the spot where the blow was received. Also epileptic coma is best treated by JUNOT'S boot, applied for half an hour; or ligatures may be placed round the four limbs, in order to impede the venous circulation, and thus the return of the blood to the brain. At the lecture a patient was exhibited who had stopped his own fits hundreds of times by clasping his legs.* (See the use of the tourniquet in different places.)

Dr. BROWN SEQUARD "On Diagnosis and Treatment of Nervous Affections" makes mention of gymnastics and ligatures among curative measures to be used.†

167. Dr. WILKS "On Injury to the Spine," says, "that it has been proved to lessen the action of the heart, relating a case of fracture of the dorsal spine, in which the beats of the heart were reduced to 40 degrees. Dr. WILKS further stated that Czermak has been able, in his own person, by pressure on the pneumo-gastric nerve at the border of the sternocleidomastoid muscle to produce a decided diminution in the frequency of the pulse. In the same lecture mention is made of a case of paralysis of the diaphragm, which was attributed to a blow in the neck from a man's fist, causing injury to the phrenic nerve.‡

The so-called divergent dorsal percussion has long since been used in kinetic practice to allay palpitation of the heart.

168. Dr. MURCHISON observes§ in his "Lectures on the

* "The Lancet," March 28, 1863.

† Ibid., Jan. 27, 1866.

‡ "Diseases of the Nervous System," *Med. Times and Gazette*, April 11, 1868.

§ "The Practice of Medicine."—Lectures by Dr. MURCHISON. "British Medical Journal," Jan. 28, 1872.

Practice of Medicine," "there can be no doubt that certain cases of paralysis are benefited by kinesipathy, or the movement cure, when all other methods of treatment have been found useless."*

169. Dr. BECHER† has applied dry cupping with great success at the Hôpital Beaujon, in the often very dangerous complication of affections of the respiratory organs in *typhoid fever*. The dry cupping was applied to the chest and lower extremities. The number of cups has varied from twenty to eighty, divided into two series, one applied in the morning and one in the evening. The number in some patients has amounted to 500 in the day. Dr. BECHER declares that since he has followed this plan, the mortality of these fevers, with this heretofore dangerous complication, has fallen considerably, and Dr. BOURDON, of the Hôpital Lariboisière, gives as favourable reports of the process.

170. Dr. MARTIN MAGRON,‡ of Paris, has employed successfully dry cupping on the spine, in vomiting during pregnancy; and in cases of obstinate hysterical vomiting, he has succeeded at every fit in stopping the vomiting by this mode of treatment. In a case of paraplegia, with convulsive fits and vomiting, this process has also been successful in controlling the fits.

171. GALEN has long since been quoted as having recommended dry cupping in the pit of the stomach for cardialgia.

172. Dr. BOURDON, in a valuable article in the *Lancet*§

* "Medical Times and Gazette," Dec. 12, 1857.

† Ibid., Jan. 23, 1858.

‡ Dr. TILLT, "Change in Life in Health and Disease."—"The Lancet," Dec. 13, 1856.

§ "The Lancet," Jan. 13th, 1877.

"On the Epidemic of Typhoid Fever in Paris," recommends in the thoracic form characterised by exaggerated bronchitis, or intense pulmonary congestion, the application every night and morning of numerous dry cups (20 to 30) to the chest and thighs.

173. Dr. GONDRET, of Paris, maintains that in cases of ague the application of a dozen or two of cupping glasses, without scarification, on either side of the spine, will cut short the disease, provided the dry cupping be used on the very outset of the cold stage."*

Ligatures by the application of the tourniquet on the four extremities have also cured intermittent fever. In removing the tourniquets the process should be made very gradual, in order to avoid a too great reaction on the heart (see above). In the use of the tourniquet in the kinetic treatment, the application should be from two to five minutes at the utmost. (The writer.)

174. Dr. LIEDBECK observes that dry cups on both arms on the part of the skin covering the deltoid muscles, and on the middle of the thighs, will often within a short time bring about a cessation of the secretion of milk in lying-in women. In a letter to the writer in 1866 Dr. L. made mention of a case of lumbago cured by the application of two dry cups, one on the loins, and one on the sacrum. "The lady was cured in this way without medicine, and without loss of blood, in less than three days."†

175. Mr. CALLENDER,‡ F.R.C.S., and Dr. MORRIS,§

* "Traitement de la fièvre intermittente, mis à la portée du Publique." Par Dr. T. F. GONDRET, of Paris.

† "On the Treatment of Woman in Confinement, &c." By Dr. P. LIEDBECK. Stockholm.

‡ *The Lancet*, March 17th, 1877.

§ Ibid., March 31, 1877.

have each a paper on the dislocation of the thigh, and the method of reduction by manipulation, which principally consists in outward rotation of the thigh; which has also been the practice of Mr. COOTE. The method appears first to have been introduced by Professor FABBRI.

Many other names might be mentioned in connection with this subject. The writer only mentions, *en passant*, that Professor BRANTING, of Stockholm, more than 40 years ago, taught how to reduce dislocations by vibrations, rotations, and manipulations. The celebrated physiologists, the two brothers Weber,* have shown that the physico-mechanical action in the so-called "*Flaschenzug*," is the most important agency in replacing as well as keeping the head of the femur in the acetabulum. The art of the surgeon consists mainly in directing the head of the bone over the cavity of the joint, when the atmospheric pressure does the rest.

176. Mr. CALLENDER, in a paper "On Dislocations of Muscles," recommends that an accurate diagnosis should first be made of the dislocated muscle; secondly, the muscle should be relaxed as far as possible; thirdly, by firm manipulation, such as rubbing with the hand, or by kneading with the thumb, an endeavour should be made to replace it; and lastly, pressure should be made whilst the muscle is on the stretch.†

177. Dr. JALADE-LAFOND deserves to be mentioned in connection with some of the operative processes which characterized the orthopædic practice at the commencement of the century. The exclusiveness and severity of this practice had at first gradually to give place to surgical operations, moxa, electricity, &c., and later also by degrees to gym-

* "Mechanik der Menschlichen Gehwerkzeuge." Göttingen, 1836.

† "British Medical Journal," July 13, 1878. "Practitioner," August, 1878.

nastics, and especially to the method originated in Sweden, which possessed resources of a more localised and systematic character in an orthopædic point of view, a method which has even in Germany been employed in a more or less unadulterated form. Among the attempts that were made to modify the harshness that characterised the means employed in the orthopædic treatment, Dr. J. LAFOND'S use of oscillatory machines deserves attention, so much the more as this kind of machine afterwards obtained a wider and more diversified use in gymnastics in general. In order to obtain vibrations of sufficient continuity and power he invented machines, which seem to have been of considerable use, and which have also been mentioned with praise by Ling (Gen. princpl. of Gymn). There is no room here to give the history of the use of other oscillatory machines in the last century. Dr. SÄTHERBERG has made use of an "oscillatory board" to facilitate the application of the chest-lift vibratory movement, a form much in use in the Ling-Kinetic treatment. For the same purpose has Professor BRANTING made use of an ordinary towel in order to facilitate the lifting and forwards pulling of the thorax or lumbar region, especially in heavy and corpulent persons.*

The great importance and the many modifications of this type of movement (recline-lean-sitting, chest-lift vibration), seems to justify the frequent attempts made to render its application more easy, though nothing can fully compensate the want of the use of the hand. The following case, which occurred in the writer's practice in January, 1858, will show an effect of this movement in procuring relief in an otherwise hopeless condition of things.

178. "Dr. LEDGER, formerly of Paris, suffering, according to his own diagnosis from "asthma humidum," but in reality

* Compare H. ROTHSTEIN, "Athæneum für Rationelle Gymnastik," and Dr. E. FRIEDRICH, "Die Heilgymnastik in Schweden and Norwegen, 1855.

from Œdema Pulmonum, an advanced hepatic disease, a large flabby heart, ascites, &c., complicated with most distressing attacks of suffocation, felt immediate relief from sharp and quick frictions (made with stiffened and somewhat bent separated fingers) along the line of insertion of the diaphragm, during a lifting and forwards drawing of the thorax, the patient leaning backwards on a sofa. Excepting a friction along the spine no other movements were used. According to Dr. LEDGER'S own expression, "this is the only thing which procures relief and prevents immediate suffocation."

It was continued during the last three weeks of his fatal illness.*

179. Dr. BONNET has invented several ingeniously contrived machines, to be used in stiffness and weakness of sundry joints of the extremities, also in cases of distortion of the spine, &c.† In the same manner have (according to VOLKMANN) Delore, Behrend, Windler, &c., invented more or less complicated machines, designed to be employed in passive movements in cases of rigid joints, &c. According to Dr. VOLKMANN they are, however, not at present considered of any remarkable value. Those of Bonnet and others, invented before 1853, are in Dr. Volkmann's book characterized by the name of "*Selbstbewegungsapparate*," because they are intended to be substituted in the place of an operator's manual help.‡

180. Whilst on the subject of machinery the attempts of Dr. ZANDERS of Stockholm to imitate the Ling movements,

* The late distinguished Swedish civil engineer, Mr. C. A. HOLM, made, at the writer's suggestion in 1851, a drawing of a vibratory machine for gymnastic uses. The original drawing, with Mr. Holm's signature, is still in the writer's possession.

† Mr. BONNET, "Traité de Therapeutique des Maladies Articulaires." Paris, 1853.

‡ BILLROTH'S "Chirurgische Handbuch." Wien, 1872.

active and passive, by machines alone, must not be passed unnoticed. Many of these machines show great mechanical ingenuity, and some of his vibratory machines are of use in several instances when a long sustained action is requisite. Machines are by their nature incapable of fatigue, and allow gymnastics to be applied wholesale, like rowing, walking, sawing, &c. But when Dr. Zanders wishes entirely to exclude the use of the hand in the gymnastic operations he overshoots the mark; and still more so when he wishes to extend the use of machines to educational purposes, as a substitute for the spontaneous and active pedagogic or school-gymnastics.* It is, however, only justice to observe the great improvement Dr. Zanders has effected in the constructions of his predecessors, viz., of the passive movements by Quellmaltz, Bernhardin de St. Pierre, Jalade-Lafond, Duval, &c., or of the active movements by Jukes, Baumgartner, Heiser, McKintosh, Pichery, Chiosso, Helmke, &c.†

It ought not to be very difficult to judge and decide whether the application of a movement made by a living, intelligent, and practically well-exercised hand, which at every moment is able to modify the form and aim of the movement, and at the same time to take notice of the general state of the patient, and thus guard against accident or injury, is or is not superior to the employment of a dead machine, which you can only imperfectly direct, and the action of which is blind and uniform. But there is no space

* In the writer's letter in "The Lancet," in Dr. HARTELIUS' paper on the subject ("Gymnastic Dissertations," Stockholm, 1865), and also by Dr. SÄTHERBERG in 1872, dissentient opinions have been expressed as to the exaggerated, one-sided views of Dr. ZANDERS as to the application of machinery in gymnastics.

† About 1842 an attempt was made by Professor BRANTING to introduce in his practice a kind of wheel, with the object of combining vibration with a rotatory motion, in order to act on the ligaments of contracted joints, axillary and cubital. As a machine it was both primitive and fragile, but was of use in the special case for which it was constructed.

here further to discuss this important subject, or to decide the possibility of superseding the whole stock of gymnastic manipulations by machines;* besides, any attempts of the writer at a panegyric of the human hand would be futile, since two men like Sir Charles Bell and Sir William Ferguson have descanted on its exhaustless capacity as an instrument fitted for all the handicrafts of man, as well as for surgical, and as the writer may presume to add, gymnastic operations.

The original gymnastic apparata at the Central Institution at Stockholm were in 1857 altered and adapted by Prof. Ling *(fils)*, more especially for educational purposes, in order to facilitate the simultaneous exercises of a greater number of pupils. This adaptation is, therefore, of importance, when it is the question of administering gymnastics in a given short space of time, and on a larger scale; as, for instance, in the greater modern schools or colleges, containing 600 to 800 boys or girls. In fact, a machinery which facilitates the *exploitation en masse* of methodic gymnastics, as in a rank of soldiers, outweighs by far in importance such machines as those enumerated above, each of which allows but *one* special movement to be executed, "*tant bien que mal*," by one individual *alone*. But whilst recognizing the advantages which, under the above circumstances, belong to the modern ingeniously altered apparatus, the writer cannot help expressing his regret at the exclusion of some of the traditional "engines." In the new modifications we look in vain for two important instruments, viz,, the tension-pole (spännstolpe), and the horizontal vibratory mast† (poutre oscillatoire—wippmast) in consequence of which two groups of important forms of movements have been excluded from the gymnastic repertory. In other respects experience seems

* The Pedagog. Society's discussion. Append. No. 1, 1857.

† The latter has been substituted by the "barresplanches" (springbom) or the horizontal bar of ovoid section.

to prove the new apparatus to answer well their intended purpose. It should here be observed that as regards apparatus the so-called Swedish method is in general liberal. It does not reject any simple apparatus as injurious *per se*, nor does it unconditionally hold up to praise any certain favourite apparatus as being absolutely necessary, or impossible to be replaced by other external means. (Compare p. 32, "On National Education," by A. GEORGII, 1869.)

181. In his book "Die Erschütterung als Diagnosticum und als Heilmittel," Dr. HEIDLER has called attention to the value of vibrations as a therapeutic and diagnostic resource. He treats, however, the subject principally from a theoretic point of view. He does not make any subjective observations. Under the name of vibration he includes also percussion produced by a Dr. Manett's hammer (p. 82).

In mentioning the form, localization, and position in the application of vibrations, the following fragmentary register may be added, as having been used in the Swedish medico-gymnastic treatment. The sign for vibration ($\overset{=}{}$), introduced by Professor BRANTING, is used for the sake of shortness.

A. In *standing* or *sitting position*, head and body without stiffness.

1. The linear spinal $\overset{=}{}$, with the simultaneous movement downwards of the hands of the operator.
2. Head $\overset{=}{}$.
3. Temporal nerve $\overset{=}{}$.
4. Sagittal point $\overset{=}{}$.
5. Suboccipital point $\overset{=}{}$.
6. Nasal $\overset{=}{}$ (the thumb and long finger embracing the root of the nose).
7. Ear $\overset{=}{}$.
8. Subaxillary $\overset{=}{}$.
9. Laryngeal $\overset{=}{}$.
10. Gular $\overset{=}{}$.
11. Axillary lift $\overset{=}{}$.
12. Arm $\overset{=}{}$ (single or bilateral).
13. Bilateral suprailiac $\overset{=}{}$.
14. Finger $\overset{=}{}$.

B. *In kneeling position*, the body leaning forwards and supported by two assistants.

15. Thoracic = (at the level of the insertion of the diaphragm, heart, etc.)

C. *In recline, lean-sitting position.*

16. Chest lift = (above or on the level with the diaphragm).
17. Loin lift = (below the diaphragm).
18. Pelvic lift =.
19. Inguinal = (the hands simultaneously moved, as in friction).
20. Inguinal femoral =.
21. Leg =.
22. Knee =.
23. Ankle .=

D. *In Crook-reclining position.*

24. Left sub-costal =.
25. Hepatic =.
26. Coeliac plexus =.
27. Umbilical or transversal abdominal =.
28. Cæcal and Sigmoidal =.
29. Vesical nerve =.
30. Uterine lift =.
31. Perineal point =, etc.

182. Dr. A. SYMONDS mentioning the use of a ligature round the head, says: "On what principle relief is afforded by a ligature around the head it may be difficult to explain, but the fact is undeniable, and the remedy of ancient repute. Shakspeare makes Prince Arthur say to Hubert:

> "When your head did but ache
> I knit my handkerchief about your brows
> And with my hand at midnight held your head."

A benumbing influence is exercised on the superficial nerves, and this would seem to be reflected on the internal nerves, which are the seat of pain. I have in my own person felt temporary relief to neuralgic toothache by firm pressure on the cheek, and in this case the operation must be of a reflex nature." (See pp. 33, 97, 99.)

"Of 90 cases, 38 reported that their headache was in-

creased by the recumbent position, 27 that they were relieved, 5 were doubtful, and to 17 it was a matter of indifference.*

183. Mr. MITCHELL HENRY, formerly of Middlesex Hospital, recommends elevation in the treatment of erysipelas of the limbs.† In a remarkable article "On Position as a Remedial Agency, with Cases," Mr. Henry indicates the importance of enforcing an elevated position of the limb in a large proportion of surgical cases.‡

184. The late Sir JAMES SIMPSON, in an article on "Diseases of Women," especially in reference to Phlegmasia alba dolens, makes use of the following expression in relation to the importance of an appropriate position: "There is another local measure of the highest value," says this great physician, "and one you must not overlook, viz., position. The proper position is elevation of the limb, which frequently gives very great relief from pain, and always favours at the same time the process of resorption. In truth position is one of the most powerful means of treatment in many diseases. Attention to this point is frequently of more importance, and affords more satisfactory results than the use of any kind or quantity of drugs." He recommends to raise the affected limb, that it may be on a sort of inclined plane. "Elevation of the limb in this manner not only tends to afford the patient the most effectual relief from her suffering; it is also of most essential importance in aiding to carry out another local indication for treatment, to promote absorption." To induce resorption after inflammation has ceased, friction is recommended.§

* Dr. A. SYMONDS "On Headache,"—"Med. Times and Gazette," May 15, 1858.

† "The Lancet," Dec. 18, 1858.

‡ Ibid., "Position as a Remedial Agent," Dec. 10, 1859.

§ Sir JAMES SIMPSON, M.D., "On Diseases of Women. The treatment of Phlegmacia alba dolens."—"Medical Times and Gazette," June 18, 1859.

185. Dr. WILKS, in recommending gymnastic exercises in chorea, says: "They not only strengthen the muscles and nerves, but they break the bad habit, they convert in fact, an irregular movement into a regular one.*

186. Dr. CLAUDE BERNARD, in an historical account of the various methods used or adopted to produce insensibility to pain, mentions the plan used by the Assyrians of compressing the vessels of the neck in infants about to be circumcised, which probably acted by producing partial asphyxia. He also mentions Moore's plan, 1784, of compressing the nerves, and Lilgaard's plan of passing a tight ligature around the limb.†

187. Dr. BOWVILL'S method of inducing anæsthesia is reported in the "Philadelphia Medical Times," from an introductory lecture by Dr. HEWSON, of Pennsylvania Hospital, consisting in diminishing or allaying sensibility by rapid inspirations. Dr. Bowvill's method is alleged to be efficacious and applicable to cases where some measures are required to diminish sensitiveness, or to induce such an amount of insensibility as will admit of the patient being manipulated and examined with a requisite degree of care. As the effect of rapid and violent running, or of blowing in order to kindle a fire, a certain amount of confusion of sight and bewilderment of mind is sometimes experienced. With these effects Dr. Bowvill recognized that some numbness of the sentient nerves was associated, and pursuing the subject further, he was enabled to bring it to practical use in his profession, that of dentistry. It was from a demonstration of the power of this method of procedure to induce sufficient

* "On Diseases of the Nervous System (Chorea)."—"Medical Times and Gazette," Feb. 6, 1869.

† "Leçons sur les Anæsthetiques et sur l'asphyxie." CLAUDE BERNARD. Paris, 1875.

anæsthesia to allow the painless extraction of a tooth that Dr. Hewson was led to study the subject. He states that he has used it with gratifying results in stitching wounds, in handling over sensitive parts, and in probings and the like. In a case where a boy had sustained a severe sprain of the left wrist from a fall upon the ice, the patient was directed to respire rapidly; which he did for two and a half minutes, when the injured wrist was freely manipulated without pain. In some other cases, owing to the nervousness of the patients, they could not be got to continue the rapid respirations, and the experiments failed; but Dr. Bradford, the Resident Surgeon of the Pennsylvania Hospital, was induced to try the process himself in the presence of the class. It was his first attempt, and it was made while in the sitting position. Breathing rapidly for about three minutes was, first of all, attended with a tingling sensation, especially of the tips of the fingers, and a feeling as though the surface was swelling. Then there followed a dizziness and confusion in the head, without the loss of consciousness, but with an inability to resist or act independently. He had no recollection of being hurt by a pin, which he found had been stuck into his flesh whilst anæsthetic from his rapid breathing."* (See p. 115.)

188. Dr. Waller, of Geneva, maintains that compression of the vagus nerve will produce asthenia or anæsthesia in surgical operations. Two cases are reported in which operations had been made, whilst under the influence of the effect of such a pressure.†

Strong lateral compression of the temporal region, and over and behind the ears, has been used as an anæsthetic in toothache and extraction of teeth.

* "The Lancet," April 22, 1876, p. 624.

† "The Practitioner," December, 1870, No. xxx.

189. The following letters from the learned and disinterested friend of the scientific development of gymnastics in Sweden, Dr. LIEDBECK, are selected out of a correspondence continued for some forty years. Dr. L.* relates two cases of incarcerated hernia cured by inversion. He first mentions that he has heard that in the popular surgery in Sweden it was the practice in incarcerated hernia to employ a tall strong man, who would take the patient on his back, the knees of the patient being bent over his shoulder, and thus to hold him by the legs, the head being downwards. In this inverted position another person rubs on the hernia with the palm of his hand from upwards, downwards, until it is reduced, and this is said to be soon effected by itself in consequence of the inverted position of the body.†

"I think," Dr. LIEDBECK continues, "that I have learned from Dr. BAUMANN‡ a new method of reducing hernia, much more simple than the usual taxis, a method which I had the opportunity of testing on the 5th April, 1875, when I was called late at night to see an old widow lady, Mrs. Strömborg, who suffered from the incarceration of her right-sided crural hernia. She had previously had colicky pains and cold extremities, and suffered from ague; she vomited much; the pulse feeble, 84. I placed her on a broad board, on which a mattress had first been laid, the one end of which was on the floor, the other resting on the side of the bed, the patient's legs and feet remaining in bed, the head and body downwards on the inclined plane. With very slight pressure the hernia was reduced, and the poor, seventy years old lady, slept the night through. I have also similarly helped the widow of the eccentric Colonel A——n, who suffered from inguinal hernia, incarcerated for three days,

* Letter from Dr. LIEDBECK, Stockholm, April 10, 1875.

† See Dr. LAFORGUE's Case, p. 117.

‡ Dr. BAUMANN, "Das Alte und neue Heilverfahren in Medecin," 1857.

and for which I had repeatedly failed in the usual taxis. My old friend, Dr. Edgren, now retired from practice, to whom I mentioned these cases, said, "Yes, it is quite natural: had I known it when in practice I should have saved many who were operated upon by others and who died."

190. Dr. THORNTON has some interesting observations on the treatment of hernia by inversion, with the object to draw attention to the efficacy of inversion alone, both in reducible and incarcerated hernia. The advantages are, according to Dr. T., that it is generally effectual, absolutely safe, and universally applicable. In the case related of strangulated hernia (oblique inguinal, right sided) it was completely successful."*

It would no doubt be profitable in certain forms of uterine displacement to employ the above principle, and thus to place the pelvis on an elevated plane in relation to the trunk of the body.

191. The presence of urine, and especially of calculus in the lower part of the bladder produces often violent pain in this organ, and makes every movement to be painful. If the patient in such cases is placed on an inclined plane, which, elevating the lower part of the pelvis, causes the contents of the bladder to move towards the superior posterior part of the cavity, which is much less sensitive, relief is almost immediately produced, notwithstanding other means having been used in vain. "How to procure relief in pains from a Diseased Bladder."†

192. The following extract of a letter from Dr. LIED-

* "The Lancet," Aug. 14th, 1875.

† BRAITHWAITE'S "Retrospect of Medicine." January, 1862.

BECK, of the 1st March, 1854, deserves a place here. "I wish," he says, "in the interest of the mechanic medicine, to draw your attention to the following case, which has a relation to a rational treatment of stone, in order to mitigate the pains from it, and in certain circumstances facilitate its expulsion. I have, during more than twenty years' practice, attempted in vain to diminish the dreadful sufferings in renal calculus. Though all the various schools of medicine, in our time, have correctly described the symptoms of the disease, the treatment they have respectively proposed, has been equally unsatisfactory with them all. In the meantime, convinced of the inefficiency of all medicines hitherto employed in the treatment of the pains in renal calculus, I was called to see a patient, Mrs. Ross, aged 50, who suffered from intense pains in the right side; urine thick, vomitings and general hyperethesia. She felt in the right inguinal region a painful spot which was directed towards the back with greater intensity. She had fever, frequent but scanty micturation, accompanied by violent pains which produced paleness, cold perspiration, and agitation of the pulse. I gave some medicine (aconite and arnica) with some little amelioration, and remembering that in the majority of cases the pain in renal calculus is produced by passive movements such as riding in a carriage or on horseback, torsions of the body, falls, the idea occurred naturally to me that passive movements ought also in a mechanical way to cure these affections rather than chemical and dynamical agencies which hitherto had always failed. I applied, therefore, what is called in the terminology after BRANTING, "*the Loin-lift vibration*" (a vibratory motion with a traction forwards of the lumbar region), the patient remaining in a recumbent position in her bed. Of all the means that had been employed this was the only thing which produced alleviation; the pains, as well as the transpirations, ceased at once. Every time the pains returned they were

diminished or checked by this movement. I instructed the husband and the maid-servant in the application of this movement, and they succeeded in producing the same result as myself. After having ascertained repeatedly the completeness of the relief which had been obtained by this movement, I heard mention made of a method of cure among the people here in cases of pains from stone. The patient being undressed, except the shirt, lays himself down on the floor, and rolls himself round several times.

"I have heard that a patient in the neighbourhood of Upsala, after having tried in vain every means which the medical celebrities at the University of Upsala had prescribed was cured by this mode.

"In thinking further over this subject I would propose that in extreme cases of this complaint it would be well to turn the patient gently with the head downwards (a strong person lifting him gradually after having placed his knees over his shoulders), in order that the stone may be able to pass back towards the calices renales in consequence of its specific gravity. The pain and suffering ought to cease at once in the same manner as a hernia has been at once reduced by the same process."

In the renal pains which often accompany Bright's disease, the writer has frequently seen relief and sleep follow the use of the lumbar lift-friction. In the case of the late Dr. Ledger (celebrated for his cerebral research, with the aid of "the magnetoscope"), the effect was for the time most satisfactory. The case in question was complicated with a weak and flabby heart, with symptoms of asphyxia. The writer applied with immediate relief, *chest-lift vibration;* the vibratory friction being directed along the inferior intercostal spaces, and made *sharply* and *quickly*.

193. In Småland, a country in the south of Sweden, there is in use among the people a kind of treatment in

torticollis, which consists in a manipulation of the contracted muscle, resembling that of one of the forms of passive movements adapted by Ling, under the name of *fulling*. Dr. Liedbeck, who has furnished this fact in addition to the many others which have already been mentioned here, continues in another letter: "Since my last I have had from one of my patients, a widow lady, Mrs. C———n, the account of another remedy among the people of the north, which is not mentioned among the "*Volksarzneimittel*," enumerated by Ossiander. The fact is, that the old lady is a very difficult subject as to healing in the matter of any wound, so much so that even the smallest scratch causes swellings and small abscesses, unless she takes means to prevent it. This difficulty showed itself, especially if she pricked herself under the nails with a needle. She had consulted in vain the first physicians. Once, in great pain, she was advised by a simple man of the people to slap (percuss) every mechanic lesion with the tip of one of the fingers of the other hand. Since she has followed this advice, she says, "that she is able to prevent the gathering every time she has had a scratch, but if she happens to neglect this manipulation she is always sure to have her old suffering."*

194. The following case of Dr. LIEDBECK is of such importance in itself, and also as it bears upon the organisation and legislation of a true hygiene in the higher public schools, that the writer makes an exception from the principle he has generally followed, not to make mention of cures produced by the Ling-Kinetic treatment.

"It would be interesting for me to know," Dr. L. says, "if any of my colleagues in England have already made observations relative to an affection of the heart, about which I am going to speak, and for which our medical gymnastics is the true specific, in accordance with the nature of the affec-

* Extracts from Dr. LIEDBECK's correspondence with the writer.

tion, and our idea of healing effects in general. In perusing some anatomical author (the name has escaped my memory for the moment) my attention was drawn to the fact that, besides the well-known conditions, of the pelvis in woman being wider than that in man, the chest of man being in every dimension larger than in woman; whilst the pelvis on the other hand in man is narrower but higher than in the female sex; we find, on comparing the angles of the arcus pubis and the angles formed by the cartilages of the false ribs of the right hypochondrium with the left, another characteristic difference, viz., the angles of the arcus pubis in woman larger than 90 degrees, but in man acute; whilst the hypochondriacal angle in man is larger than 90 degrees, but in woman smaller, or at the utmost amounting to 90 degrees. These conditions presuppose everything to be in normal development as regards the lower part of the thorax. When the hypochondriacal angle, as appears from underneath the integuments, on the contrary, is less than 90 degrees, the thorax in both sexes has not its normal form and development. It is evident that in woman, from the fashion of distorting the figure by the use of stays, especially when tight-laced, the hypochondriacal angle becomes more acute through the depression of the ribs and their cartilages, by which the free action of the lungs becomes impaired, causing palpitation, oppression of the chest, involuntary sighing, &c. The mechanical effects of the pressure of the corset become still more important, from what I have observed in post-mortem examinations, as regards the liver, which is frequently forced to abnormal growth, in so far as, that contrary to its normal form, the lateral diameter is diminished whilst the antero-posterior diameter becomes larger; nay, the liver is even pressed downwards below the edge of the ribs, in order to find place where place is to be found, which is afforded by the yielding and relaxed abdominal muscles. It is even possible that the dress of the woman is the cause that the sternal angle at the pit of the stomach is

only acute, or, at the most, a right angle, never obtuse, except in cases of considerable emphysema, which obliges her to leave off both the corset and all tight-fitting dresses around the lower part of the thorax.*

* Among the most inveterate habits and obstinate prejudices that gymnastics at first had to encounter and to overcome in Sweden were the wearing of stays, and the idea that anything more than the use and development of one side of the body could be wanting; in connection with which we have the saying, "heaven sent us women and the devil stays." Stays were worn by all classes, from the highest to the lowest in the land; and even those who, during the gymnastic treatment, were advised to discontinue their use, were met with reproach, and even abuse, from the stay-ed sisterhood. To our gymnastic doctrines, and perseverance, is owing the change for the better in the adoption and promulgation of a sounder opinion in this respect; not omitting, however, to acknowledge the influence that the writings of physicians against the use of stays may have had, nor forgetting the all-despotic power that fashion at different periods has exercised. As allied to the subject the following may be added:

The writer has been accustomed since 1849 to recommend to his patients a kind of suspension garters, and had a model made to show how they should be worn, instead of the usually worn ligature garters used above or below the knee. He is glad to find that in England, at least, his plan is in a fair way of being generally adopted, somebody having taken out a patent for suspension garters, and several physicians recommending them in preference to the old plan. As to the development question there is no intelligent gymnast at present who does not enforce on his pupils a due attention to an equal development of both sides of the body; thus realising the ambidextral doctrine advocated by advanced minds since Benjamin Franklin first wrote upon the question. Some of the comments made when Ling first commenced his reforming career at the University of Lund in the beginning of this century are rather amusing, whilst they show also the universal opposition with which he was confronted. Thus, even at the ladies' coffee meetings, his new doctrines were severely handled, and expressions like these were met with, "What do you think the madcap Ling has done now, he has introduced fencing with both hands, and he wants in the guard position the weight of the body to be on the posterior instead of on the anterior leg . . . . and, says another, he wants us all to leave off stays!!"

"In man, using generally a looser dress, the precordial region is generally normal, with the angle of the cartilages larger than 90 degrees, but I have even seen men where this angle has presented an acute opening. In such cases we find often tubercular deposits in the lungs, or a secondary affection of the heart, depending on the pressure of the ribs on the heart, which thus being irritated, an increased action (palpitation) is set up, causing hypertrophy, or even under certain complications, atrophy. The former is the case with those who do not suffer from tubercular disease, the latter is the case in phthisis pulmonalis, and has been proved by post mortem examinations. Occasionally this abnormal form of the thorax is also accompanied by secondary bronchitis. With every exertion follows great excitement, anxiety, &c., which increases the palpitation of the heart, often causing even fits of syncope. I have observed lately a still more curious case in which the hypochondrium of the left side was depressed in an acute angle against the right one. The patient had been treated medicinally with sal-ammoniac, digitalis, &c., of course with no result. Professor Branting was of opinion that this depression was caused by a paralytic state of the intercostal muscles. How far I am of the same opinion the copy of my certificate, without any bias for ancient or modern modes of treatment, will show. The result of the gymnastic treatment which was at first carried out in the country by Mr. Torén, M.A., under the superintendence of Professor Branting, will be seen hereafter. Dr. Jentzen, the patient's former physician, had declared that neither gymnastics nor homœopathy could do anything in this case, observing at the same time that he could do no more himself. With all this Dr. Kreysig's old expression is quite to the point, 'Heart disease is a distressing disease.'

"The cause of this paralysis intercostalis is probably the following: the, in other respects, powerful young man, had,

whilst living in the country been perfectly well, amusing himself with shooting, swimming, and other sports. At once, on going to the University of Upsala, he is confined to a small room, where he lies continually on his left side, keeping a heavy book in the left hand. After some months' constant reading he begins to feel unwell, and after a successful examination the present symptoms become manifested; and though he, during the following session, passed his examination, the injury was already done. At present he has a kind of fit; he gets livid, the extremities become cold, he feels as if he should die, he looks quite bewildered and loses his speech, the respiration is very much oppressed, and at the same time there is congestio cerebri, the head feeling heavy and confused. It had been surmised that this could be cured by some sedative pills and foot baths, and keeping the bowels open; rhubarb, cream of tartar, salts, were not omitted, besides cuppings, &c. The pulse is feeble, large; when the fits occur it is said to be intermittent. He felt some relief from my advice to use an enema of cold water when the bowels are confined, without any medicine. My certificate was as follows:

"Mr. John Alfred Erling, whom I visited last week in the Rectory of Huddinge, is suffering from disease of the heart, principally caused or accompanied by paralysis intercostalis sinistra, and is therefore unfit to enter into active service, unless by the use of appropriate medico-gymnastics for some months, and probably as an adjuvant, some hydropathic treatment, his affection becomes alleviated, and gradually conquered; which, according to my opinion, never can be effected by any kind of pharmaceutical remedies. This I hereby testify as my opinion, which I corroborate with my oath as physician, so God help me here and hereafter. Stockholm, 15th of July, 1858.—P. T. Liedbeck, M.D.*

* This is the form of medical certificate in Sweden obligatory on the physician, according to the law of the country.

"This decided opinion of mine had been confirmed through repeated observations of the effects of a rational medico-gymnastic treatment in similar cases, amongst which I only mention the following: 'Mr. Granberg, captain of a merchant vessel, was always well whilst at sea, but no sooner did he put his foot on land than he became more or less suffering. On examining him a few years ago I found the hypochondriacal angle acute, the beat of the heart strongly vibrating against the left side of the thorax. He had used divers medicines without the slightest benefit. I did not prescribe any medicines for him, but sent him to Professor Branting, who perfectly cured him. The following year, however, no sooner had he come on shore again than he felt his former symptoms, furred tongue, dry skin, precordial oppression and anxiety, general sinking feelings, along with strong pulsation of the heart against the thorax, disproportionate to the feebleness of the pulse. Persuaded by his former physician he went this time to Dr. Sätherberg's gymnasium, and became well, probably by the application of the same movements as taught and employed by Branting. The patient highly praised the gymnastic treatment, thanking me, in the following words, for my advice: Had you not advised me to use medical gymnastics, I should probably have died, or at least I would have become a constant martyr to the abominable drugs from the chemists' shops.'

"The result of the movement-cure in Mr. Erling's case has entirely justified my opinion. The treatment having been continued in the country for a couple of months (see above), the patient could be removed to Stockholm, and for the sake of convenience, the treatment was thenceforth administered by Mr. Brouhn, director of the gymnasium in the southern suburb of Stockholm. Though improved, and living quite close at hand, he was obliged to rest sixteen times in the street before he arrived, quite out of breath, and livid in the

face. His treatment commenced the 2nd November, 1858, and was continued till the end of May, 1859, thus lasting for six months. In March the patient found himself so much improved that he, contrary to the advice of Professor Branting, resumed his official duty as a notary. Though occupied only one hour daily, his symptoms became, however, so much worse that he was obliged to discontinue, and to procure a new certificate for leave of absence. I am aware that the physician to whom he applied for a certificate, as well as others, considered his sufferings to be primarily the result of hypertrophy of the heart, and that the alteration in the form of the thorax was only secondary; but, nevertheless, my opinion is decided, that the hypertrophy, if there ever existed one, was caused by the paralytic state of the intercostal muscles of the left side, in consequence of which the heart not having sufficient room, became oppressed, and the beat against the thorax apparently larger than if both sides of the thorax had been symmetrical. I think it was Claude Bernard who, by pressure with the finger outside the thorax on the left side, where the beat of the heart (ictus pulsus cordis) is felt, produced, in the rabbit, first syncope, and after continued pressure on the same spot, the death of the animal.

"Mr. Erling had exposed himself to a somewhat similar influence, by remaining month after month lying constantly with the book in his left hand, with the elbow and arm closely pressed to the side, whilst making annotations with pencil with his right hand, as before mentioned. To return to Mr. Erling's recovery. In the months of June, July, and August he passed through a febris lenta nervosa. The gymnastic treatment was afterwards resumed in the month of October, and in the course of a month he was quite well, and able to resume his duties.

"In the meantime I had taken the opportunity of examining his thorax, and found its form much more normal,

although as no measurement had been made, the perfect symmetry was not fully ascertained."

From this case, and from many others of the same nature, has been deduced a general law of important application. This law contains, according to Dr. L., the two following principles, viz., in the first instance, that there is often to be found among the boys in the public schools a "*Hemmungsbildung*," as to the forms in the external part of the thorax, which diminishes the breathing power, causes a mechanic pressure on the heart, and thus induces the known symptoms of hypertrophy of the organ; and, secondly, that the physical education by means of gymnastics should, in all such cases, *not be interrupted, but exchanged* from pedagogic to medical gymnastics. To defend all kinds of gymnastics, as has often been the case in some countries, increases the evil. The patient is always improved by a well-balanced and localised medical gymnastics, which soon enables him to resume a properly conducted pedagogic gymnastic for healthy youths.

This is another proof of the importance of keeping the different subdivisions of gymnastics in their natural relationship as to practice. The founder of the Swedish method has certainly in his posthumous work adopted the ancient subdivision of gymnastics, viz., one branch for *the treatment of disease*, called medical gymnastics, another branch for *healthy persons*, called pedagogic gymnastics; a third branch formulating rules for attack and defence, in the wielding of weapons, the fencing with different weapons, corresponding to the *agonistic of the Greeks*, and therefore called military gymnastics.* He has also from the pedagogic or hygienic branch *separated and developed* a distinct branch, called æsthetic gymnastics, meant principally to be used by the

* By Mercuriales and other writers of the sixteenth century, called "*Gymnastica bellica sive luctatoria.*"

public orator, and in dramatic schools, and for artists, as it gives scope for methodising and developing laws for the expression of various internal emotions.* But these four subdivisions, in the book mentioned, are intended to facilitate a survey of the whole, not to produce a state of unsatisfactory divergency or division among gymnasts, which can only lead to an endless variety of specialists.

195. In his suggestive and philosophical work "On the influence of Mechanical and Physiological Rest,"† Mr. JOHN HILTON has given valuable additions to the aid employed in surgical diseases. If so able and conscientous a writer could have found time and opportunity to discuss in the same lucid and complete manner the influence of physiological and mechanical motion as a curative agency, he would, no doubt, have earned still more the gratitude of the profession, for both rest and motion belong to what the author has called *natural therapeutics*. Motion and rest may be said to be the two poles of health, as they are certainly two of the chief natural agencies in restoring health. As a general proposition it may be admitted that *the more a disease assumes an acute form the more nature demands local or general rest; the more it assumes a chronic form the more nature requires local or general motion.* In the more serious forms of chronic

* This necessitates a caution against the use of this branch in schools for children, or physically undeveloped persons, since that may be so easily caricatured which should be the "*creme de la creme*" of gymnastics. The writer saw in Germany many years ago a class of young ladies, all more or less deformed, going through what was meant to be a course of æsthetic gymnastics, but which unfortunately turned out to be a gross caricature of the same, showing the danger of tearing the often thin veil between the beautiful and the ludicrous."

† JOHN HILTON, F.R.C.S., "On the Influence of Mechanical and Physiological Rest in the Treatment of Accidents and Surgical Diseases, and the Diagnostic Value of Pain." London, 1863.

disease, one of the main difficulties of the physician is to devise means for recruiting impaired, or exhausted local or general vital energy. Experience has abundantly proved that rest *alone* fails largely in accomplishing this end; nature demands the use of physiological motion as well as of physiological rest, *along with* other therapeutic agencies.

Mr. HILTON observes: "Nature when undisturbed has a constant tendency to repair her own injuries, whether those injuries be the result of fatigue, of accident, or of inflammation." In other words, we have here the idea of vis medicatrix naturæ, an attribute of the human organism which contains the several phenomena which are generally called *reaction*, for want of a better expression. The plates, from original dissections, and the great number of cases which are given of various forms of surgical diseases, are most instructive, both illustrating the importance of the subject. Nobody will peruse this work without adding to his knowledge, especially as regards articular diseases. The cases of hip-joint disease, among others, cured by rest, are most instructive.

The author, in order to explain the cause "why an inflamed joint is fixed and flexed," lays down the following proposition, based on anatomical, physiological, and pathological considerations: "The same trunks of nerves," he says, "whose branches supply the groups of muscles moving a joint, furnish also a distribution of nerves to the skin over the insertions of the same muscles; and what more especially merits our attention, the interior of the joint receives its nerves from the same source. This implies an accurate consentaneous physiological harmony in these various co-operating structures."

This principle no doubt affords proof of the value and important use of *akinesia* in therapeutics; but under different circumstances the same principle will equally apply in favour of the use of motion, for in the question of rest the similar

rule applies as to that of motion. It is of importance in both cases to take into consideration the different effects of a *total* or *local* application. Even in the question of rest there occur instances of a specific selection.

The importance of the application of these laws is nowhere more apparent than in medical gymnastics, in which the operator has so often to co-operate with the patient, in order to administer a well-adjusted motion of resistance.* It happens, notwithstanding, on account of technical errors (manual inability), that he frequently does not succeed in localising the muscular action of the patient. The most common faults in this respect are: 1, a wrong position either of head, chest, and shoulders; 2, neglect to attend to the fixity of those points on which the correctness and localization of the movement depend. This fundamental law is common both to the medical and the pedagogic branches of gymnastics.† In the latter case the writer refers to "*The Reglement of Gymnastics*" for the Swedish army of 1836, which, on almost every page, points out the faults which

* This is what the Germans have lately called "*Wiederstandsbewegungen.*"

† It is to be observed that though this law has been called fundamental, there are among the passive types of movements some which have not this general character, as, for instance, the loose-sitting transversal supra iliac vibration (see above), a movement in which it is necessary that the trunk be kept in a relaxed position in order that the vibration may be transmitted to the, in this region, deep-seated organs. It is a fault to overlook this precept. A somewhat similar fault occurs in a recline-lean-sitting bi-manual sacral-nerve pressure (see Hartelius, fig. 89), and also in the sub-costal vibration, in the transversal abdominal vibration, &c. (the same position), if the head is raised. Another exception to the general law mentioned above is, if the position of the head in a jugular vein-pressure, in a laryngeal or tracheal vibration is brought backwards. In a sciatic nerve-pressure it is enough to move the hips a trifle backwards to cause this movement to be abortive, on account of the difficulty in reaching the nerve, &c.

generally occur in the execution of the exercises.* In the medical gymnastics only a couple of instances will suffice as examples. In most of the movements executed in a stoop-falling position (Fig. 45 "Regl. for the Swedish Navy, 1878") it is a fault if the hips descend below, or become elevated above the straight line, which should be observed from head to heel, omitting other faults which would require a long description. In a backwards traction from a kneeling position (Hartelius, fig. 81) it is a common fault that the hips are brought backwards, and thus form a more or less obtuse angle, instead of head and trunk forming "*tout d'une piece.*" To this fault is often added that the chin is brought forward, and the shoulders elevated. The operator, moreover, often neglects to see that in the starting position the instep and toes are supported on the same level as the knees. In a half-stretched astride sitting lateral bending (see *Kinesitherapie*, p. 31, as to description) the faults are generally, bending of the elevated arm, poking of the head, turning of the shoulders out of the plane in which the locus motus should be traced, the sinking in of the chest, the non-fixity of feet and knees, &c. The writer is forced to limit himself to these few examples which might easily fill a separate treatise. A trained eye will easily detect more or less conspicuous faults which abound in the illustrations of works on gymnastics.

It is to be regretted that such illustrations, in sufficient number and correctness, are still wanted even in the Swedish method, which is characterised by the greatest correctness, and therefore is in greater need of accurate elucidations than other less rigorous methods.† (See p. 79, note.)

* It is well known that this attempt at "selection, purity, and correctness" as regards positions and movements, has contributed to characterise the Swedish method as pedantic ever since the time of Dr. Russdorff's critical observations on the subject.

† Even the merest tyro will understand and see the fault that, for instance, in the old and much-used formula in hygienic and medical gym-

196. It has been a general rule in the Swedish method to avoid all kind of pain, and this, the writer has been told, is still the case with the massage in France, with the exception of the treatment of sprains. In England rubbing is generally applied in a mild form. There are still in some distant and isolated counties of Sweden old women, who seem instinctively to follow the rule to rub more around than upon, the affected part, joint, &c. Before leaving the subject of the kinetic *quality*, the writer may be permitted to observe that it is determined and graduated by several different causes; viz., either in some cases by quickness, or in others by duration (repetition); in others again by actual force, which is to be overcome, and lastly, by the greater or smaller area of active muscles participating in the effort. This as to the active types (see "Handbook in Kinesiology," p. 113). The passive movements again are graduated either by the increase of duration (continued repetition), or by the actual force employed. Lastly, in connection with our subject the following interesting observation as touching the normal measure and frequency of gymnastic exercises must not be omitted. Professor CH. LOVEN, in his popular exposé of "The Blood and its Circulation," 1876, pp. 60, 61, makes use of the following remarkable expression in relation to what in the gymnastic writings has been called "*interpolations*." "From what has been said," he observes, "we find how deeply the necessity of exercise (motion) is founded in our organism, and we perceive, consequently, of what beneficial influence a rationally arranged gymnastics must be capable, especially in the case of such persons as from their occupation, trade, bad health, or other causes, are obliged to follow a too sedentary life. It is, therefore, of very great importance to keep this well in

nastics for weak children or others: the sitting twisting—it must not be omitted to fix the knees—and still this has, sometimes, been overlooked. Of errors of similar kind, see Dr. SCHREBER'S "Kinesiatrik," fig. 176, 177.

mind in relation to the pupils in our schools, who often, during several hours, continue to maintain a position which can only act injuriously on the circulation in the veins. It is clearly in this respect much better to let the pupils now and then, at short intervals, make use of some few simple exercises adapted to the purpose, than to postpone these exercises to a separate hour for gymnastics, during which what has been previously neglected, you will in vain attempt to obviate or set right."*

A representation of the phenomena which accompany rest and motion contains indications which prove the importance of a correct quantity (measure) of both. As to both, nature has always furnished some wakeful sentinels, or controlling agencies. For the active exercises, the sense of fatigue and pain is the constant guardian; for the passive forms the pain alone. Ever since the time of the Grecian people cases have been recorded of injurious effects from exercises which in themselves are innocuous. Numerous examples are on record of violent contests in gymnastics, of boat races, violent dancing, running matches, &c.† A singular instance will be found, p. 43, *Kinesitherapie*, as observed by Dr. LIEDBECK, of a young student in Upsala, who having laid a wager to go down on one leg twenty times, fell down as if struck by lightning. The harmlessness of the movement in itself is evident, and confirmed by use in numberless cases. This example of youthful folly is related by Mr. C. Euler ("Pia Desideria," Bruxelles, 1879) as an evidence of the violence of the Swedish gymnastics, which, however, have more frequently been accused of being too cautious and pedantic.‡

* See below, Professor BRANTING's proposition in 1857 to introduce in schools some exercises during the ordinary school hours.

† Relations on Feats of Strength are mentioned by Niggeler in "Schw. Turnzeitung." See also Desaguillers, Depping, Hodgkin, &c.

‡ Compare LING in "Jduna," Swedish periodical, 1814, on the subject of "precipitant" exercises

Medical periodicals of 1878 mention the abuse of the favourite exercise among girls, the skipping rope, in a young delicate girl, with whom headaches, faintings, &c., occurred after a wager as to who should skip the longest, she having been the winner. As another example of the serious effects which have been observed to follow violent exercises, the following may be quoted. "We know," says Dr. M. FOTHERGILL, "that an aortic cusp has occasionally been torn down by the high blood pressure of violent effort."*

Dr. HOPE, in his treatise "On Diseases of the Heart," makes mention of physical exertions, rowing matches, continuous exercises, &c., as causes of hypertrophy of the heart, besides numberless observations of the same nature by other medical men.

It will be found, even in relation to passive movements, that several authors have made mention of different influences exerted by different quantities of movement. This has, in some cases, been the cause of different opinions as to the effects of some kinetic operations. Thus, for instance, have movements in a stooping position, and also the jugular-vein pressure, long since used and recommended by Ling and Branting (see p. 67, 68) been described and accepted by Dr. Neumann and others; whilst other physicians (Sätherberg and Drachmann), and lately Dr. Droixhe and Dr. Corra, have, on the contrary, expressed doubts as to their usefulness, even for healthy persons; doubts which probably rather represent a fear of excesses. The following remarks belong also to this category:—

Pressure applied to larger nerve trunks, as, for instance, on the sciatic, the popliteal, the crural, the facial, the supra, and infra orbital, the pneumogastric nerves, &c., are somewhat painful, even when applied with a well-adjusted force.

* "On the Neurosal and Reflex Affections of the Heart." By Dr. Milner Fothergill.—"Braithwaite's Retrospect," January, 1879.

So also the important sacral nerve-pressure. Percussions with a small pointed hammer (pinnstaf) are still more painful. The same might be said of the sensations produced by the application of "the skin-pincher," a small instrument introduced by Professor Branting, and used in neuralgic pains, &c. One of the many gradations which are comprehended under the common name friction, causes also a considerable amount of pain; but in applications of this form great care has from the first been taken in our treatment to commence the application of the friction round about the painful or inflamed part. (See p. 44.)

To return to the so-called "interpolation," it will be necessary, in order to avoid misunderstanding, to say something as to its nature and beginning. Professor Branting, as the head of the Central Institution, made an application to the School Board in Stockholm in 1857, recommending a plan to introduce a few exercises of so simple a character that the masters would themselves be able to conduct the short gymnastic lesson; which was to last only from five to ten minutes after a certain table of words of command, so simple and easy as to enable some of the elder boys as monitors to direct their comrades. This short lesson was to be repeated every hour before or after the usual short rest or play out of doors. However, this proposition, though it had been approved of by the School Board, met with a good deal of opposition amongst the pedagogues and the gymnasts, on account of its novelty, and soon became obsolete.* The idea contains in itself a truth of greater importance than the introduction of many of the modern complicated gymnastic implements. But it is in perfect accordance with the attempt to lessen dependence on apparatus, which distinguishes the Swedish

* See "Die Militairwochenblatt, Beiheft, 1869, by Colonel Borbstædt, of the Prussian army, in which periodically an official report is given of the then state of the Royal Gymnastic Central Turnanstatt in Berlin. "Swedish Translation," p. 48, note.

method; and to make use only of such furniture as is to be found in every private room or school-room, &c. It is also evident that this method of interpolation presupposes the full use of the usual rest between school-hours for play in the open air, which must not be interfered with. The writer has heard that the interpolation has been of great use in schools where the above rules have been conscientiously followed.*

197. An attempt to write the history of cases cured by active exercises alone would far exceed the limits of this pamphlet. A few examples will be enough for our purpose. The writer has elsewhere mentioned that Ling had cured himself of rheumatism by fencing, and that starting from this fact he began to develop the theory of his system of curative movements.

Dr. LIEDBECK relates the following case some years ago in a letter in which he says, "Last week I was attacked by severe rheumatism in the muscles of the neck and shoulder, having been exposed to a current of air during damp and cold weather. I went to Professor BRANTING in the hope of getting relief from my pain. He employed some passive movements, such as pressures and tractions of the skin over the affected part, &c., from which I felt greater relief than from some active movements of the arms which also were tried. The sensibility and pain, however, returned, though in a mitigated form, and it occurred to me that old Ling had cured himself of rheumatism, caused by repeated exposures to damp and cold, by fencing. I said I will also take some fencing lessons after the old style, and I at once set about it. Taking a stick in one hand and my umbrella in the other, I placed myself before the wall, against which I commenced to lunge alternately, first with one hand and then with the other. Feeling soon a genial warmth spreading over the whole body, I ceased, and perceived that the pains in the shoulders, neck,

* See some Swedish writings, 1869, 72, 77.

and arms, had disappeared. When the pains returned I had recourse to the same exercise, and was soon quite restored, and was glad of this opportunity of verifying in my own person the truth of Father Ling's experience."

198. The following fact is mentioned by the celebrated Swedish historian E. G. GEYER: "Count Pehr Brahe, junior, in speaking about Gustavus Adolphus in his books of proverbs, relates that once he was alone with the Great King in his room, when he was suffering from a tertian fever, which he had taken during the autumn in Prussia." "He fenced with me," says the Count, "with both hands, in the dining-room for some days, and he attacked so strongly that the fever left him."

199. Dr. LIEDBECK mentions also that his wife and one of his friends, Dr. T. Warberg, were cured by an active passive movement—riding on horseback—and in commenting on these facts, says: "The difficulty is to know when one ought to make use of active or passive movements, or when we should use medicine, water, electricity, &c. In every disease it is the same, and the fact will be recognised when once medicine shall have adopted other therapeutic agencies, as well as drugs."

200. A fact which the writer remembers from his childhood as having occurred in his own family, belongs to the same category as those here mentioned, and illustrates the instantaneous curative result which may sometimes follow a violent muscular effort.

His father, an officer in the Swedish army, had lost his left arm in Pomerania, 1807, in the war against the French. Several years afterwards he had an attack of acute rheumatism in his right arm, on account of which he was obliged to keep his bed for a couple of weeks. During the period of

convalescence the attendant physician was evidently *au bout de son latin*, all internal and external medicines, though applied with great skill, having failed in restoring the lost power in the arm, which quite as if paralyzed, was kept in a sling. One day, in going out to overlook matters on his farm, he found his people occupied in shoeing a restive and vicious horse, an operation to facilitate which he had devised some special arrangement. However, the animal, evidently suspecting what was going to be done to him, resisted the efforts of three or four men, who vainly attempted to bring him to, and fix him at, a barrier. The writer's father who, when in health, possessed enormous strength, forgetting for a moment the paralytic state of his arm, at once ran to the animal, laid hold of the bridle, and brought the horse to its place. The arm and hand were instantaneously cured; the sudden and violent volitional effort having, as it should seem, instantaneously burst the barriers which the disease had established in the motorial currents of the nerves of the arm and hand.

201. Lord Byron is found noting in his journal (28th March, 1814), that "after having, when previously very unwell, sparred with Jackson *ad sudorem*, he felt much better in health than for many days, remarking at the same time that the more violent the fatigue the better his spirits for the rest of the day; and this, too, at a time when he was deriving only a little relief from his favourite remedies, abstinence and soda-water."*

202. Lord Bacon says: "Nobody can be healthful without exercise. Diseases of the body may have appropriate exercises; bowling is good for the stone and reins; shooting for the lungs and breast; gentle walking for the stomach; riding for the head and the like" (Bacon on "Studies").

* Andrew Combe, "The Principle of Physiology." Eleventh Edition. Edinburgh, 1842.

203. Dr. FULLER has a word of caution respecting exercise which deserves a place here: "Nothing can be more beneficial," he says, "to gouty subjects than regular and active exercise. It promotes digestion, stimulates the action of the skin, increases the activity of the other secreting organs, and by its influence over the function of respiration, it serves to prevent the accumulation of uric acid in the blood. He warns against the danger of exercise in excessive degree, as leading to bodily and mental exhaustion. In the former its action is antagonistic to gout, in the latter it is distinctly provocative of it."*

These few instances of the effects of general exercises, along with what has been already stated in these jottings respecting the active forms of exercise, are in themselves remarkable; but if no other resources were at the disposal of the medico-gymnastic practitioner than these, the application and uses of the mechanical agency would be very limited. The active forms of the treatment have been designated as the backbone among the curative means of kinesiatrics, on account of their strengthening and developing effects. And by the double concentric and eccentric movements (Neumann), or synergic movements (Meding), or specific active movements (Georgii), (all different names for the same thing) the characteristic effects of these localised, resisting movements on greater or smaller groups of muscles can be derived; and important results on nerve and vessel, nay, on the sanguineous fluid, thereby be obtained. Thus, where it is desirable to obtain a derivative action, or a tonic action, or a developing effect, &c., either locally or generally, the Ling-Kinetic forms of active movements are of great importance, and in many cases no other therapeutic agency can be substituted for it. The mechanical principle on which they are based—laying hold of the leverage of the skeleton—makes

* "On Gout, Rheumatic Gout, and Sciatica." By H. FULLER, M.D.

them, as to number, almost unlimited. Any description of them cannot here be expected, nor would an enumeration of one or two classes of them serve any useful purpose. The reader interested in the subject will find some details in the writer's Kinesithérapie, or in Dr. Neumann's op. cit., or in Dr. Roth's translation of the same.

204. Dr. SCHNEEMAN, of Hanover, advocates the treatment of scarlatina by cutaneous inunction, which, he maintains, "materially shortens the duration of the disease, and checks any infection at the end of the third or fourth day."

205. Mr. WM. TAYLOR has used frictions and inunctions in the treatment of acute diseases. Mr. Taylor, as surgeon to the Clerkenwell Infirmary, London, has had ample opportunity of applying his plan of treatment, and reports cases of typhus and inflammatory fever, of scarlet fever, of dropsy, insanity, &c., in which the treatment has been successful, and materially shortens the duration of the disease. He has found that the "hard ointment" (equal parts of lard and suet) is the most useful for the inunction.*

The learned 'Börner,' p. 59, has a register of different embrocations.

LING considered that fevers did not belong to the kind of cases in which the mechanical agency should be used. (The writer. See Appendix.)†

206. The following interesting fact was many years since mentioned to the writer by the great advocate of medical reform, Dr. ROB. DUDGEON. "There exists," he said, "in

* WILLIAM TAYLOR, M.C.S.E., &c., "On a New and Successful Treatment for Febrile and other Diseases, through the medium of the Cutaneous Surface, illustrated with Cases." London, 1850.

† P. H. LING, "General Principles of Gymnastics." Stockholm, 1834–40.

Constantinople a kind of erysipelas, which gradually travels all over the body, and which, after having in vain been treated by internal medicines, gradually runs its course, lasting from four to six weeks. This disease has been treated with far better results by a kind of pressure and kneading of the skin; in fact, its progress has thus been cut short by a few applications."

207. Dr. LAUDER BRUNTON has ascertained, and mentions it as a curious circumstance, that in poisoning by mushrooms, tickling the fauces proves much more efficacious in producing vomiting than the administration of tartar emetic.*

208. A correspondent in *L'Union Medicale* calls attention to the fact, that palpitation when not depending upon organic disease, may be almost immediately arrested by bending the head downwards, and allowing the arms to hang pendent. The effect is even still more rapidly produced by holding the breath for a few seconds while the body is in this bent position.† It ought to be observed here that on the contrary, deep inspirations will at times greatly modify the violent action of the heart. (The writer.)

209. The writer is going in a few words to touch on one of the most important, though least recognised effects of the movement-cure, viz., its influence in the treatment of diseases of the heart; a subject which has its peculiar history in different countries of Europe. Since 1849 he has in vain attempted to obtain a recognition on the part of the profession in England, as to the use of a rationally localised kinetic treatment in diseases of the heart. Very early, shortly after

* "Antagonism of Atropia and the Poisonous Principle of Mushrooms." By Dr. LAUDER BRUNTON.—"British Medical Journal," Nov. 14, 1874.

† "The Homœopathic World," May, 1876, p. 239.

his arrival in England, he persuaded Dr. Chapman to make a trial of the kinetic form of treatment for his patients. The result soon led to other trials, and obtained for him at the same time the friendship of this great and good man—a friendship, interrupted only by his death in 1867. But though Dr. Chapman's kind personal interest in the writer, and the cause he advocated, led to the publication of a separate pamphlet,* with an important list of cases, including serious forms of heart affection, no impression was produced on the deep-rooted conviction prevailing as to the unsuitableness of kinesiatry for this form of disease; and yet England is a country which furnishes a large contingent of diseases of this kind; and if once thoroughly enlightened on the subject, it would derive great advantage from the adoption of Ling's treatment in this affection.

Professor BRANTING is, no doubt, the first who has thrown a clear light on the gymnastic treatment of this class of diseases; and who has had the greatest experience and measure of success in the kinetic treatment of affections of the heart. In evidence of this we have not only several accounts by German physicians, but still more, we have the thirty volumes of prescriptions (1828—1845), which are among the collection of manuscripts in the library of the Gymnastic Central Institution.† That the rationale of the kinetic treatment of this disease did not earlier obtain greater clearness, is traceable in a high degree to the circumstance that its pathology and diagnosis were first fully explained by Laennec, Skoda, and their followers. Their gymnastic treatment, however, goes farther back under the form of a

* Op. cit.

† This valuable collection having been carefully made and classified by Professor LING, fils, assisted by Mr. UNMAN, at present representing the movement-cure in Hamburg, will be a lasting memorial of Professor BRANTING'S great industry and skill, for future generations of gymnasts. There are at present some thirty new volumes collected of prescriptions from Prof. B.'s experience and practice since 1845, intended as a gift to the Institution.

gradually acquired empirical experience, in full harmony with the physiological knowledge of the period.

One of the earlier cases of heart disease, which was mentioned even before the writer's engagement as teacher at the Central Institution in 1829, was that of a young cavalry officer, Mr. Norderling, who was cured of an hypertrophy of the heart, complicated with hæmoptysis. This occurred before 1828, about which time the terminology of Branting was adopted, and along with it the introduction of written prescriptions for the patients. Lately, when the writer, after so many years absence, had the opportunity of examining this collection of prescriptions, he recognised several names of patients who, in his time, were treated for diseases of the heart. The principles of the treatment already laid down and followed by Ling are: "This kind of affections ought to be treated with the most careful manipulations, and with the closest observation. No such patient should have violent exercises. As regards the treatment the following aims are to be kept in view:—1. Attempts should be made to diminish the irritation caused by the pressure of neighbouring parts on the heart; 2. To diminish the determination of the blood current to the heart; 3. To diminish the tendency to an excessive nutrition of the heart. The *first* is obtained by developing a greater muscular power in the spine, as a means of obtaining a necessary enlargement of the thorax;* the *second* by directing the blood current to all other parts of the body, but especially to the pelvic region, and to the arms and legs; the *third* by increasing nutrition in less important parts of the body, viz., the arms, the legs, the loins," &c.† Dr. Neumann, the zealous friend and advocate of this method in Germany, has in his writings confirmed these observations.

In order to clearly point out the degree of recognition

* See Dr. Liedbeck's Case, pp. 146, 154.

† Op. cit., p. 537.

this treatment has obtained in the profession in Sweden, the writer may be permitted to reproduce some statistical tables by Dr. HARTELIUS, successor of Prof. Branting, in the medical department at the Central Institution, from a paper read by him at the Society of Physicians in Stockholm, 1877. The doctor introduces the subject by calling attention to the fact "that diseases of the heart are nowhere abroad treated, as yet, by movements," observing "that we (Sweden) may count several decennaries since its commencement." Later on he enumerates the active and passive forms of movements employed in these cases, and mentions the importance of individualising the treatment. "Experience has proved," he says, "that serious diseases of the heart require to be constantly under the influence of an appropriate movement cure, or that they require this treatment to be often repeated."*

The subjoined tables of Professor HARTELIUS' are interesting on more points than one. In the first instance they present a survey of the number of cases and the different forms of heart disease, with the age and sex of the patients, which have during five years been treated at the clinic of the distinguished professor at the Central Institution; and they give also some idea of the extent to which this treatment has been made use of in Sweden.

HYPERTROPHY OF THE HEART.

Age.	1872.		1873.		1874.		1875.		1876.		Total.	
	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.
10—20 yrs.	6	1	5	2	8	2	7	1	9	1	35	7
20—30 „	18	2	8	2	9	—	11	—	10	1	56	5
Total	21	3	13	4	17	2	18	1	19	2	91	12
												103

* "Hygeia: Medical and Pharmaceutical periodical," August, 1877, No. 8.

Professor H. makes the following remark: "The greatest number of cases of hypertrophy, without valvular insufficiency, are those of youths from the public collegiate schools. These lads have generally been excused from the obligatory educational gymnastics, in consequence of general weakness, or commencing hypertrophy of the heart. Such boys are usually not fond of games and other corporal exercises, but remain in a stooping and contracted position, which hinders free circulation and respiration."

VALVULAR DISEASE OF THE HEART.

Age.	1872.		1873.		1874.		1875.		1876.		Total.	
	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.
10—20 yrs.	5	1	3	1	2	2	2	5	2	2	14	11
20—30 „	7	2	14	3	8	6	6	5	11	6	46	22
40—60 „	1	—	3	1	4	1	4	—	5	—	17	2
Total	13	3	20	5	14	9	12	10	18	8	77	35
											112	

The Professor observes that the treatment should be symptomatic, and combined with a rational diet. It is then generally successful, but the result obtained is simply that of being improved. Among the 112 patients there were only 15 who had derived no benefit.

FATTY DEGENERATION OF THE HEART.

Age.	1872.		1873.		1874.		1875.		1876.		Total.	
	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.
20—40 yrs.	1	1	—	3	—	2	3	5	4	6	8	17
40—60 „	1	1	4	1	1	2	4	—	1	2	11	6
Total	2	2	4	4	1	4	7	5	5	8	19	23
											42	

"Among these 42 patients who suffered from fatty degeneration of the heart, seven only derived no benefit from the treatment." It would be desirable that the statements of Professor H. in reference to these affections should be made known to the profession in England. (The writer.)

At the discussion which followed the reading of this paper, Dr. SÄTHERBERG confirmed the statement of Dr. Hartelius about the curative effects of medical gymnastics in affections of the heart, as obtained in his orthopædic institution, adding: "that confirmed organic disease of the heart cannot be completely cured is evident, but in most such cases the patients have, however, obtained a notable amelioration as to their suffering, and this frequently as early as the first month of treatment. Dr. Sätherberg expressed his astonishment that the remedy in question was so seldom used abroad in the treatment of diseases of the heart, and attributes this to the circumstance that the movement-cure is considered too fatiguing for such patients. "Such an opinion," he says, "shows a complete ignorance of the nature of Ling's method, and of its great number of modifications and resources; graduations of the movements being found in connection with the system, from such as are applied simultaneously and powerfully to large groups of muscles, to such as are localised and of the mildest character; and this whether the movements are active or passive. They can accordingly be used in the case of very delicate and sensitive patients, without the least inconvenience. As no dissentient voice was raised during the discussion on this important subject, the inference may be drawn that this was the general opinion of the meeting."

A pamphlet of Professor NYCANDER of Brussels,* published 1874 under the title, "The Treatment by the Swedish

* "Le Traitement par la Gymnastique Médicale Suédoise; est il utile ou nuisible dans les Maladies du Coeur. Bruxelles, 1874.

Medical Gymnastics, is it useful or injurious in Diseases of the Heart?" seems to indicate that a doubt still exists in the medical mind, even in Belgium, as to the value of the kinetic form of treatment in heart diseases.

210. Dr. A. PINELL, of Paris, has coined a rather formidable name, "*Pressineuropathy*," for a method of diagnosing diseases of the chest and abdomen, by compression of the pneumogastric and sympathetic nerves. By compression with the fingers on any portion of these nerves, and the peculiar sensations thereby produced, the seat and nature of the malady from which the patient may be suffering are by him defined. Dr. Burgrave, of Brussels, has, it appears, declared that, as a means of diagnosis, it is even superior to auscultation or plessimetry.*

In Ling's writings mention has already been made of diagnostic movements. (The writer.)

211. Professor WESTPHAL has noticed that the reflex action, known as "the knee phenomenon," which results from a sharp blow struck on the ligamentum patellæ, whilst the leg is pendent and half flexed, the limb thereby being suddenly raised, owing to a reflex contraction of the triceps cruris, does not occur in patients who are in a condition threatening loco-motor ataxy. This fact is, therefore, of value in diagnosis.†

212. Mr. GERARD, a French military surgeon, mentions several cases of sprain of the ankle treated with success simply by rubbing, by pressure, and by alternative movements of flexion and extension of the joint.‡

* "Medical Press and Circular," November, 1878.

† Berlin, "Klin. Wochenschrift," i., 1878. "The Practitioner," Dec., 1878.

‡ "Medical Times and Gazette," Dec. 12, 1857.

213. Dr. NELATON, the late celebrated French surgeon, also pointed out the importance of trying these means, and has recorded instances of rapid and complete success in recent and old standing sprains. In cases of sprains of the ankle from leaping, cold water was immediately and continuously applied, but the patient remained unable to walk for three weeks, when he came under Dr. Nelaton. One of the "externs," pressed with his thumbs with increasing force over the painful parts for about a quarter of an hour. In the course of the day the patient began to walk, and next day left the hospital.*

214. Dr. DOUGLAS GRAHAM publishes two cases of sprained ankle, treated by massage, in the one of which, that of a young lady, the ankle had been sprained three times in two years. After the treatment there had been no relapse. In the second case the patient was cured in half a dozen visits.†

215. Dr. BONNET, the late distinguished surgeon of Lyons, in relation to sprains produced by muscular contractions (lumbago), makes mention of several cases cured by manipulations; amongst the number that of Lieutaud,‡ who says: "It is necessary, however, to distinguish a false nephritis, a sharp pain, with impossibility of movement, which comes on suddenly, after a violent effort, or even in raising oneself after having been bent forward in a certain position. This is a real sprain, and can be cured at once by adjusting the displaced part in the same manner as you do for the foot; but I know not by what fatality it is, that the surgeons are not successful in this small matter, which is allowed to fall into

* Ibid., Jan. 23, 1858.

† "Medical Record," No. 253; "Practitioner," January, 1878.

‡ LIEUTAUD, "Précis de Médecine Pratique."

the hands of persons who are without experience, but who nevertheless do good by sharply rubbing the parts, well smeared with oil, either with the thumb alone, or with the whole hand. I have several times had this operation performed at the first indication, and almost always with success." From Dr. Bonnet's *Traité Thérapeutique** the following extracts are copied: "In the beginning of the year 1837 Dr. Martin, the elder, sent to the Medical Society of Lyons, a paper '*On the Treatment of some Muscular Affections, even down to the Present Time, wrongly ascribed to Rheumatism.*'† Having been led to consider the affection in question as due to muscular contraction, I proposed to myself," he continued, "to make researches and experiments on the first opportunity. I had not long to wait. A month afterwards I was called to a patient suffering from violent lumbago; he was lying on his bed (*à la renverse*) suffering from a severe pain in the lumbar region; this pain became so intense when he attempted the slightest movement in order to change his position, that he was well nigh ready to faint. It was not without difficulty that I succeeded in placing him in a reclining position, so as to be able to examine the state of the sacro-lumbar muscles. I soon discovered that those which belonged to the left side of the spine were spasmodically contracted; and that the bundles of fibres known by the generic name of *multifidus of Albinus*, formed so many small stiff and tense cords, which strained the vertebræ, to which they were attached, and gave to the lumbar spine an abnormal lateral curve. I hesitated not to rub (*masser*) with my fingers along the whole surface of their contraction, and I succeeded in less than ten minutes in completely softening out all the cords which I had discovered by the more or less deep pressure of my hand. This operation finished, the

* "Traité Thérapeutique," Paris, 1853, pp. 639—43.

† Martin ainé, ancien, chirurgien en chef de l'hospice de la charité de Lyon.

pains immediately ceased. All the movements of the body were executed without difficulty. The patient dressed himself alone, and went about his daily occupations. Not long afterwards, having in connection with a severe surgical case, to meet in consultation some of my colleagues, among whom was my celebrated friend, Marc Antoine Petit, he sent a message asking me to excuse him to his colleagues, as he was prevented from attending on account of a violent lumbago which kept him on his couch. I received his message about nine o'clock in the morning—the meeting was fixed for eleven o'clock. I presently went to him, and promised him a speedy cure if he would submit to a process, the theoretical explanation of which I would give him as soon as it had succeeded. He at first regarded my promise as a joke, but when I assured him in the most solemn manner that I could 'spirit away' his lumbago in less than ten minutes, he jestingly said to me, 'Well, dear *conjurer*, let us see. Set to work at once.' I placed him in a suitable position, and put myself astride over his back in order to give more facility and strength to the *massage*, and in the space of five minutes I succeeded in effacing all the partial and irregular contractions of the muscular bundles, and in restoring him to perfect freedom for all the movements of which he had been deprived. He dressed himself, and we went together to the house of the patient where we were to meet for the consultation.

"It is more than thirty years since this occurred, and it is as present to my mind as if it had passed yesterday. I see still before me the astonished expression of my illustrious friend, the hesitation with which he adventured to move in every direction, and I fancy I still feel the impression of the *embrace* he gave me in the effusiveness of his gratitude.

"I have had more than a hundred cases of the same kind, which presented the same symptoms and the same success. I give only one of them, as it has a ludicrous aspect, which

obtained for it a place in a *feuilleton* of a medical paper. The wife of an honest workman, in the country where I live, came once to ask me to see her husband. He had been, she said, in his bed for a week, suffering from rheumatism, which had resisted all the means used by the medical practitioner, under whose treatment he was. I came to him at the time, when they were preparing to put two blisters on the lumbar region. After a short examination I took the '*officier de santé*' aside, and tried in vain to make him comprehend the real cause of the pains, and the kind of process by which I would make them promptly to cease. He was inclined to discuss the point, which I declined; he got angry and retired, shrugging his shoulders. As soon as he was gone I commenced work. The *massage* produced, in less than ten minutes, its wonted effect. I had not forgotten, however, the irreverent shrug of the shoulders; I thought, therefore, I would take an innocent revenge by letting the supposed rheumatic immediately carry the blisters to the medical practitioner, in order to prove to him that I was in the right, in similar cases to these, in saying to the patient, '*Surge et ambula.*' "

Dr. BONNET mentions that a younger brother of Dr. MARTIN has also had recourse to the same treatment with equal success; and observes that he had himself used *massage* in lumbago in a great many cases, and, if he had obtained less satisfactory results than the Messrs. Martin, he attributed it to his not having operated with all the precautions which these gentlemen always used; by either on the one hand using less force, or on the other by arresting the manipulations at too early a stage.

216. The prominence which the so-called massage has lately obtained in some countries, perhaps more so in Sweden than anywhere else, will justify the writer in reverting to it in these pages, the more so as it, at all events, has helped not

a little to popularise the gymnastic idea in the professional mind, and also to the realisation of a personal experience as to the therapeutic value of mechanical agencies, at least in certain forms of disease. Among the modern French authors on the subject, the writer has only had the opportunity of seeing the works of Dr. ESTRADÈRE and Mr. LAISNÉ, the former distinguished by as much learned historic research, as the latter by candour and modesty.

Dr. ESTRADÈRE has thought fit to repeat the absurd assertion originating with Mr. N. DALLY, essentially an idealist, viz., that Ling has copied his system from the Chinese Cong-Fou, a truly far-fetched fable.* With an equal amount of truth Mr. DALLY might have said that Ling got his idea from the moon.

The notions of Dr. Estradère are of the same nature as those of Dr. Schreber,† who gave expression to the following strange statement: "The Swedish gymnastics embrace no free exercises, but only positions, and some duplicated movements." (See Zimmergymnastik, Edition 1863, p. 7, compared with Gymnastic Reglement, Stockholm, 1836, Dr. Neumann's, Rothstein's, and Roth's descriptive works on the subject.) This critique on the part of Dr. Schreber

* Some short time after the writer had published in Paris his pamphlet on Ling's system, about the beginning of 1847, Mr. DALLY, in a pamphlet, written evidently in order to recommend a new gymnasium in Paris, begins thus: "Il n-y-a que deux hommes qui aient eu la pretention de regenerer l'espèce humain—Ling de Stockholm et Triat de Nîmes." Notwithstanding this apparently flattering expression, there is reason to believe, that could the northern gymnasiarch and Swedish academician, in his wonted austere simplicity, have seen his French, soi disant confrère, decked out in his red costume, à la Mefistophèle, as he used to expatiate, with his herculean clubs, in the Gymnase (Allée des veuves, Champs Elysées)—Ling would not have felt himself flattered by the boastful parallelism.

† Compare "Kinesiatrik oder die Gymnastische Heilmethode." By Dr. D. G. M. SCHREBER. Leipzig, 1852.

would be unintelligible, were it not for the manifestly clumsy attempts to imitate the Ling duplicated movements (see "Kinesiatrik," &c., von Dr. Schreber, 1852, Fig. 176, 177), in which he fails in the most simple rules of technical correctness.

There is no space here either to enter into the *older mode of explanations* (Branting, Georgii, Neumann), or the later (Metzger, Curman, Berghman, Helleday, &c.), the following brief remark can only therefore be made: "Only certain passive movements, namely, the more violent tripsis, &c., can be readily explained as producing a crushing, and this followed by fatty degeneration, and then by resorption, in accordance with the *latest mode of explanation*. It is impossible to explain the comfortable sensation of more easy respiration (increased permeability of the lung) which almost instantaneously follows on a correctly made thoracic percussion,* chest lifting, chest-lift vibration, &c., through such a slow process of metamorphosis in certain cases of dyspnœa, or bronchial affections.

An affinity may in this respect be found in some forms of active movements; inasmuch as expectoration in certain individuals is induced by some movements, as, for instance, quick twisting of the trunk, backwards bending of the trunk, and even by the bending and stretching of the arms in their adapted three directions (see the Swed. Regl. for Gymn., 1836, mom. 96—116), an effect, as regards the arm-stretchings, already observed by Mr. A. B. Santesson.

From Dr. ESTRADERE'S book it would appear as if he had been straining every effort, to convert the characteristic

* "Die Heilgymnastik," von Dr. A.C. Neumann. Berlin, 1852, p. 301. Dr. Neumann has shown immense industry and perseverance in having in a short period acquired a theoretic knowledge of the method, although he has exhibited at the same time quite a mania for explanations. He has also the merit of having given numerous descriptions of the kinetic operations, though it is to be regretted that the illustrations are badly drawn, and many of them incorrect, especially in the first edition. Similar faults are unfortunately to be found in several other descriptive authors on the Swedish gymnastics.

tendency in the Swedish method to determine or localise movements to certain organs, histological elements, and tissues, into the vague generalities of the massage. It is, therefore, not to be wondered at that the learned doctor has been unable to see anything new in the Ling-Branting therapeutics. And yet, p. 34, 35, after having mentioned some formulæ of the Ling movements, he says: "Je pourrais citer un grand nombre de ces formules, mais elles trouveront leur place ailleurs, quand il sera question des procédés de massage qui conviennent le mieux dans telle ou telle affection, ou dans tel ou tel organe. C'est là un des mérites que je me plais à reconnoitre à la gymnastique de Ling, *non que je veuille inférer de là qu'il en est l'inventeur, mais dans les nombreux procédés de massage (?) que j'ai lus, il est bon nombre de formules indiquées par Ling que je n'ai trouvées chez aucun de ses prédécesseurs.*"

Of course frictions and rubbings have existed, and been used, as long as the human race has existed; and as a means of relief ever since the first "funny-bone" was struck ("man kratz wo es jucht") and so with several of the other manipulations, the names of which have passed to us from the most ancient records. The writer has certainly found that even percussions were used before Ling; but the manner in which Ling knew how to localise these movements in order to make them act on certain nerves or vessels in some more near or remote connection with the diseased organ or tissue, is so novel and characteristic that it amounts to a new science.

Dr. E. seems even himself to be in some doubts about the preference of massage, saying: "*Les formules, qu'il* (Ling) *a donnés sont elles préférables au massage simple? C'est ce que l'expérience seule peut démontrer.*" This appeal to experience is what the immediate followers of Ling have always courted, and experience will have to be in the end the arbitrator in this as in every other scientific question. It is evident that a method which is characterised by anatomical

and mechanical correctness, will facilitate such an examination as Dr. E. justly desires, more than the vague processes of the actual massage.*

216. Professor Dr. C. CURMAN, in an admirably written paper on "*Massage or Manipulations in their adaptation for Hygienic and Therapeutic Purposes*," gives a short and lucid account of the subject, and has cleared up some doubtful points in the modern massage, as compared to that of the ancients; and has done full justice, no less to Ling's medical gymnastics, than to the massage, which he derives from the Greek *tripsis*, as meaning something more than the Latin *friction*. Having mentioned that Tissot might be looked upon as the introducer of the modern massage, and that Recamier, Martin, Bonnet, &c., countenanced the practice of the French "rebouteurs" (bone-setters), he adds: "Not-

* Dr. Estradère has more than once made mention of, and given quotations from the writer's pamphlet on "Kinésithérapie," a production simply intended to serve as a rapid review of the subject, then known only by hearsay to those outside the boundaries of Sweden. And in all truthfulness it should be said that you could not expect in a pamphlet of some hundred and forty pages, to find more than at the best a resumé; you would scarcely look for a corps de doctrines, containing rules and descriptions for the practice of a new system of mechanic medicine. This might, of course, lead to misconceptions, and the writer is quite ready to confess that he may have committed an error of judgment in giving expression to ideas, and to novel and startling facts, for which the medical mind at the time was not prepared. Thus, for example, a critic on the pamphlet in question, exclaims, in relation to an increase of the girth of the chest, (mentioned indeed by Professor Branting as rather an uncommon case, yet still in perfect accordance with truth,) "Il faut une fois robuste pour y croire." Had the writer entered into the philosophy of the fact, mentioning at the same time that there is scarcely a single case in which during the kinetic treatment, the chest and breathing power are not increased more or less considerably, Dr. Malgaigne, the critic, might have felt inclined to accept the fact as related, and so in other cases. (See cases in Dr. Chapman's pamphlet, "Ling's educational and curative exercises," &c.)

withstanding this, it cannot be denied that the honour attaching to the rational regeneration of the medical gymnastics and massage, their development on a physiological basis and their being popularised, belongs to Ling and his school, in spite of the attempts of Messrs. Dally and Estradère to lessen and deny it."

Whatever is new in the massage as such, seeing that it has been doubtless developed, modified, and enlarged by outside pressure (Swedish method), can, as a department of mechanical agency, be easily absorbed and superadded to the Ling-Branting therapeutics.*

When the writer, about Christmas, 1846, was asked to give a lecture at the Hôpital des Enfants Malades (Paris), on Ling's system, several of the medical men present, when the passive movements were exhibited, at once exclaimed, "Ah! c'est le massage." It may easily be supposed that he failed in his attempt to explain the difference between massage and the specific action of certain Swedish movements of the passive type, as directed essentially to such nerve or vessel as may be in some relation to the abnormally affected organ or tissues; as for example, in the case of a rheumatic affection in the trapezius muscle, the manipulation is generally directed to the accessory nerve of Willis, instead of being brought to bear on the muscle itself, and so in many other instances.†

Be this as it may, the writer, in order to lay particular stress on this characteristic property, gave to the movements the denomination of *specific active* and *specific passive move-*

* The difference in a few words are: 1, that in the massage the application is made on the *nude* body; 2, that a greasy substance is used, as among the ancients, to prevent abrasions of the skin; 3, that a more frequent repetition and a more lengthened continuation of the manipulation is used, and carried so far as even to produce excruciating pain, and at times suffusion of blood.

† The other form, directed immediately to the affected organ or tissue, corresponds to what is called "massage," and has also been used in the kinetic practice, as for instance, deltoid-fulling, &c. (See above.)

ments, by which designation he hoped to prevent their being confounded, on the one hand with the usual forms of active exercise, such as walking, running, jumping, dancing, fencing, riding on horseback, playing cricket, at ball, &c., and on the other hand, with rubbing, thumping, and the like.* Nobody can, for instance, maintain that the following passive movements are massage; viz., the hæmostatic movements (with the head downwards), the application of the tourniquet, &c., or the ringing movement, used as a mechanical soporific, &c. Besides, massage embraces only a part of the passive types.† This is not the place to inquire how far the writer's pamphlet and short practice in Paris in 1847 until May, 1848, gave an impulse to the more general practice of the massage in Paris; at least he was unable at that time (1848) to find any who professionally practised massage, except the indifferent illustration of it, to be met with at some bathing establishments, where it was applied much in the same rough and unsatisfactory manner, as was the case in the London Turkish baths a few years ago. During the last twenty years, however, several pamphlets and papers of more or less interest have appeared "On Massage," in France, Germany, &c., in addition to those already mentioned.

218. Dr. E. DALLY (fils) has treated the subject more

* As the attribute "specific" action, as applied to gymnastic movements, has been found fault with by many learned critics, it is a pleasure to find that Dr. Zander, of Stockholm, recognises certain movements as having a specific action. (See his pamphlet, "Medico-Mechaniska Institutit," 1871). The writer is ready to acknowledge that an important objection may be made to the use of the word *specific* in relation to movements, in so far as in medicine this expression is generally applied to a remedy which is more or less *curative* in a *certain disease*. In kinesiatrics, on the contrary, the expression is meant to convey the idea of a local effect on a certain organ or tissue.

† See Dr. CURMAN'S paper. The well-known effect, in some kind of neuralgic pains, produced by the rest of "the healthy hand" on the diseased part, would not be more easily *explained* by calling it massage.

from a scientific and critical than from a practical point of view. Dr. D. has, during a long period, showed a general and great interest in subjects related to gymnastics.

218. Dr. PHELIPPEAUX, pupil of a known masseur, Mr. Gerardin, has also written on the subject.*

In Professor N. Laisné's work will be found some good plates for the demonstration of his method of applying massage; and what is perhaps still more important, the reports of Drs. GUERSAN (père), GUERSAN (fils), BAUDELOQUE, BLACHE, BOUNEAU, BATAILLE, TROUSSEAU, LATU, &c., as to the curative results of massage and gymnastics, especially in chorea, epilepsy, idiocy, &c.

219. As has already been seen, the assertions of Dr. Estradère have not passed unnoticed in Sweden. The distinguished Professor, Dr. M. HUSS, has given expression to his valuable opinion in reference to this question in reviewing Dr. E.'s book. Whilst doing full justice to the unwearied attention which Dr. E. has given to the subject, and to the learning and historical knowledge which he has proved himself to possess, he takes note at the same time of the unjust opinion which he has expressed on Ling, "whose extraordinary merits in the field of gymnastics," Dr. Huss says, "ought to be recognised with gratitude."

220. Professor Dr. HARTELIUS (who among his colleagues has the rare advantage of being practically acquainted with all the branches of gymnastics), at present the head of the medical department of the Central Gymnastic Institution at Stockholm, in his "Gymnastic Observations," and also in an interesting paper "On the history of the so-called Mas-

* "Gymnastic Observations," by Dr. F. T. HARTELIUS, Stockholm, 1865.

sage," has expressed opinions from which the following extract may be quoted. "It is only at the commencement of the nineteenth century," he says, "that we are able conclusively to establish the beginning of a new era for gymnastics. They then came into contact with modern science. That originated the system of Swedish gymnastics, which has at the present time extended to many other countries."*

"As regards the Swedish gymnastics and massage, we may as well at once state definitely that the latter constitutes only a part of the former. All the manipulations contained in the massage are known to practitioners of the Swedish gymnastics. It is a great error to consider the Swedish system identical with massage, when massage only consists of a part of gymnastics." Then having noticed the absurd statement set afloat by Messrs. N. Dally and Estradère, that Ling had simply reduced to method what had been practised in China and known ages ago, as well as amongst Greek and Roman physicians, he continues: "These and similar expressions presuppose ignorance of the gymnastic system invented and practised by P. H. Ling, and afterwards continued by his followers."

"To any one possessing the slightest knowledge of the completeness of this system, the assertion that it is a copy of the gymnastics of the ancients, must appear as perfectly incredible. Ling's system is something different from that of the Chinese, even though some resemblance may be traced; it differs also from the gymnastics of the Greeks, however highly their system may be estimated. The most important thing in Ling's gymnastics is the scientific basis on which they rest, but this has manifestly not been derived from the Chinese, but from the scientific attainments of these

* "Review of Gymnastics," edited by F. T. HARTELIUS. Professor Hjalmar Ling, Lieut. Törngren, and Lieut. Balck as co-editors. 2nd Part. Stockholm, 1874.

modern times." Professor H. further reminds us that in Sweden, as well as in Finland, it has from of old been customary amongst the people, in cases of sprains, neuralgic pains, &c., to knead and press and rub the part, with or without the accompanying use of the bath.

222. Professor ESTLANDER, of Helsingfors (The Finnish Society of Physicians' Transact, N. 14, 1872), tells us how the massage, as a popular remedy, has existed in Finland from the most ancient times; and further, that he has been in circumstances to test this remedy, and that he has found "in inflammation of the joints with stiffness, in dislocations and sprains, that it is superior to the usual remedy employed by the doctors."

223. In consequence of Dr. METZGER, of Amsterdam, having obtained great success by the use of "massage," especially in more or less acute affections of the joints, his method early became a subject of considerable interest to the profession in Scandinavia. Besides the articles already referred to by Dr. Curman and Dr. Hartelius, Professor ROSSANDER* has published interesting observations and cases from his clinic at the Seraphim Hospital at Stockholm, and Dr. BERGMAN and Dr. HELLEDAY (having during some months assisted at Dr. Metzger's clinic) have given a short but lucid account of Dr. M.'s practice, together with physiological *explanations* of the effects of the passive movements he employs.†

One characteristic in Dr. Metzger's method appears to be a certain firmness, not to say harshness in its application, regardless of the pain that may be produced by the manipulations. In order to prove that aches, pains, and sugilations are not always necessary accompaniments in the application of massage, the two following quotations are appended.

224. Dr. Curman, in relation to massage, quoting the lines of Martialis:

* "Hygeia," op. cit.

† "The Northern Medical Archive," 1873. Vol. v.

"Percurrit agili corpus arte tractatrix,
Manumque doctam spargit omnibus membris,"

says, "Massage must never become what may be called painful in its application; notwithstanding its hardness, it should rather produce a sensation of calmness and refreshment."*

225. Mr. GIRARD subdivides the time for the application of massage in sprains into three periods. In the first the friction is extremely light and mild, the skin being scarcely touched, "effleurée" by the points of the united fingers, and always from below upwards. After the lapse of from ten to thirty minutes he commences what he calls the real massage, when the patient can *without pain* endure a pressure equal to the weight of the hand. In the first and second periods a greasy substance should be used to facilitate the gliding of the hand, and make its contact with the skin more gentle. In a sprain of the ankle, for instance, the friction should be used from the point of the toes to the superior third of the tibia, more or less lengthened in duration, according to the severity of the sprain, but practised according to the same gradation softly and mildly. He then applies passive motions of the joint in all directions, but only when the strongest pressure of the hand produces no pain.†

It might interest English readers to know that not a few physicians in Sweden have adopted the so-called massage as a speciality in their practice. Still more that the old idea originated by the founder of the Gymn. Central Institution at Stockholm, that medical students should complete their medical curriculum by going through a course at this Institution, is coming a step nearer to its realisation. Professor

* Dr. Curman "On the Turkish Bath."

† GIRARD, "Des frictions et du Massage dans le traitement des entorses de l'Homme" (Bull. de l'Acad. de Méd., 1858, tom. xxiv., p. 135, et Gaz. des Hôp, 1858). Dr. Le Blond's "Manuel de Gymnastique Hygienique et Médicale." Paris, 1877.

Hartelius has for two years given clinical lectures to some students from the Scandinavian medical schools.

225. Professor Dr. CURMAN, besides what has been already mentioned, has in a short notice in "Hygeia"* described his own experience during a treatment at Dr. Metzger's for an old standing affection of the knee and ankle joints, of which he had himself been the subject. The operations consisted principally in kneading, fulling, boring, pressing, and stronger and weaker rubbing, which may fitly be classified under the common name massage.

Dr. Curman gives on this occasion a hint which in its bearing on the right relation of these operations to gymnastics as a whole, outweighs large volumes. Dr. C. refers, *en passant*, to the importance of certain *active movements* as adjuvants in cases of inflammations of joints, whether they are of traumatic or rheumatic origin. This observation is an essential one; the more so, as otherwise an absolute limitation to passive movements would diminish the resources of *the healer* in the cases in question. Even before the forms of massage had succeeded in gaining favour with the profession, it was well known at the Central Gymnastic Institution that a great many of the above affections, as well as those of a cachectic character, require not only a local treatment, but are sooner and more completely and permanently cured by a comprehensive kinetic treatment according to Ling, in which the active movements are allowed to have their full share. This corresponds in some degree with what occurs in too exclusive and local *active* treatment. It has been observed that, for instance, a "*foot rotation*" *alone* will only for a few days cause cold feet to feel warm. So also the simple lifting the body by the arms, and jumping on the volting-horse are processes not fit to be employed *alone*, in order to develop the narrow

* "Hygeia," 1872, p. 188.

chested and thin armed youth. (See "Kinesiology," p. 134.) It is well to remember the old fact that *active movements alone*, much and often repeated, have cured many morbid growths, rigidity and stiffness of joints, &c. The diminished mobility of the whole body, which, as a necessary consequence, follows many forms of local disturbances in the locomotive apparatus, contributes to the aggravation of the patient, unless active gymnastics of a more general character are simultaneously cooperating. In fact, the active movements are the very backbone of the kinetic treatment —a true "*non-medical tonic*," which, besides its vivifying power, has a developing element, characteristic for the medicina mechanica alone. The kinetic method cannot be mutilated without some loss of curative power; its *membra disjecta* cannot equalize the action of the whole.

The writer does not for a moment intend to deny that there are thousands of cases in which the exclusive use of a passive or active form of movement alone has proved curative, because that would be to reject the testimony of a great part of the experience collected at the Central Institution of Stockholm about the specific action of movements. This has already been mentioned in sundry writings dating from 1842, by Drs. C. U. Sondén, Richter, Neumann, &c., down to the present time. Mr. T. Brandt, having had at one time his practice very much amongst common country people, has observed that these are more accessible to the influence of one or two exclusively passive movements than others. The writer's intention here is only to sound a note of warning against a too one-sided use of the different resources of our treatment. Even the passive forms of movements which do not fall under the category of massage, and a considerable number of active forms, will no doubt become as popular with the profession in Europe as the massage has lately become, as soon as physicians have gained a greater practical knowledge of these, and of their effects, than can be obtained

through the literature since 1844. The probability of such an extension of favour on the part of the profession might be deduced from the many attempts which some European and American physicians have already made, to imitate artificially several active and passive types of the Ling movements, through the aid of complicated machines, used as substitutes for the necessary manual force or skill, otherwise afforded by competent assistants.

227. Dr. RANSON DE SAINT-MAIGRIN treats sprains successfully by compression and movements. In his pamphlet on the subject he gives the following as a result of his method, the first idea of which Dr. R. himself acknowledges as due to Dr. Guillard d'Arcy:

Of 80 cases of recent slight sprains of the ankle, 36 were cured in three days, 29 in five days, 6 in six days, 4 in eight days, 2 in nine days, 2 in ten days, 2 in eleven days, 2 in twelve days, 1 in sixteen days, 1 in seventeen days. In chronic cases the treatment has lasted from three to thirty-five days. Ten cases of sprains of the knee have been cured in from four to fourteen days. In 18 cases of sprains of the wrist the treatment lasted from three to sixteen days.*

228. Dr. BERGSTRAND, in his report on the medical service of the army and navy at the Hospital for the garrison of Stockholm, observes:

"The massage has been employed with great advantage in the surgical wards, in cases of distortion, of which the entries have been numerous; also in acute as well as chronic affections of the joints, especially the form of the latter called tumor albus (granular hyperplastic synovitis). A methodical application of massage shortens considerably the duration of these complaints. A severe distortion, with in-

* "Du Mouvement Appliqué au Traitement de l'Entorse. Par le Dr. Ranson de Saint-Maigrin.

filtration of blood into the soft parts, can by massage be cured in half the time which was usually required by the old methods, the use of ice, painting with iodine, compression, &c."*

229. Dr. GERST† has published an interesting pamphlet on the therapeutic value of the massage, having been led to its adoption by the favourable results obtained by the said method by two army surgeons, Dr. Mohr and Dr. Gassner,‡ in the hospital for the garrison at Würzburg.

Dr. GERST has used the massage in 41 cases of contusion, (Quetschungen) of the soft parts and the bones, especially of the lower extremities; in 42 cases of inflammation of joints, of which 39 were acute; in 4 cases of inflammation of the sheets of tendons; in 3 cases of simple luxations; and in 2 cases of fractures. "The patients were, as a rule, by an energetic and persistent carrying out of this method of cure, as early as the second, at the utmost on the fourth day, free from all swelling; and only suffered even from the strong pressure on the contused part, some slight pain, which was soon, by continuous massage, completely removed. The contusions were on an average cured in 6·5 to 6·7 days of treatment. Dr. G. has also used the massage in 21 cases of acute catarrh of the pharynx, 10 cases complicated with coryza, otitis, concussion of the brain, &c., all with satisfactory results. In most cases a compress à la Priessnitz was the only accessory treatment. The passive movements employed, consisted of quickly repeated centripetal frictions (effleurage) on each side of the neck and larynx for about ten minutes, the neck having

* "Contributions to the Official Statistics of Sweden." The Account of the Board of Health for 1877.

† "Ueber den Therapeutischen Werth der Massage." Von Dr. Gerst. Würzburg, 1879.

‡ Dr. Gassner, Stabsarzt, Erfolge der Massage bei Gelenk—Contusion und Distorsion. Aerztl. Intelligenz, Blatt., 1875, No. 35.

previously been well oiled. The treatment of the acute cases lasted from $1\frac{1}{2}$ to $3\frac{1}{2}$ days. This communication of Dr. Gerst is of great interest, as he is the first M.D. who in acute affections has made use of manipulations in cases such as acute catarrh of the pharynx, in otitis, &c.

229. Dr. WRETLIND,* of Gothenburg, has, in an able paper, called attention to a fact of great interest, if it should become established by further observations; namely, that cephalalgia, migraine, and tic, are often caused by a myetic affection, exhibiting itself by palpation as a partial swelling of the superficial muscles of the neck, such as cuccularis, splenius capitis and colli, the scaleni, &c. He maintains that "massage" (why not call it kneading and rubbing, tripsis, or, better still, therapeutic manipulation) of the thus affected muscles, has cured the affections in question.

The writer has often in cases of cephalalgia and cerebral congestion seen relief follow by what he has called *sub-occipital friction;* a passive movement directed to act on the occipital nerves, as well as on the rich venous plexus situated between the layers of the posterior muscles of the neck. That this movement has more than a local effect is proved by the peculiar sensation of "internal shivering" along the spine, which it produces in many persons; in others again, the remark has been made, "I feel it down to the toes."

230. The following observation of Dr. Dumontpallier will help to explain the effect of many of the passive kinetic or localised movements. "The true seat," he says, "in an anatomical sense, of some forms of pain, apparently felt in the periphery, is the sensory centres. Irritation set up in *loco dolenti*, or in the neighbourhood of a painful spot, assuages the pain, or even causes it wholly to cease. So also when irritation is set up at symmetrical places upon

* "On Headache." By Dr. E. W. Wretlind. Reprint from the periodical "Eira."

the side of the body which is opposite to the seat of pain, such irritation often suffices completely and permanently to allay the pain."*

231. A numbness was observed in the anterior and middle part of the right thigh for about four months in the case of a barrister, and though treated by Dr. PIDDUCK with various remedies, it remained in *statu quo*. This suggested, at first, that the patient was threatened with what is termed "the barrister's paralysis." Dr. P. noticed, however, that the patient was in the habit of sitting sideways at his writing table, thus throwing the principal weight of his body on the outward branches of the sciatic nerve, on the right side. Hence the local numbness was clearly traceable to partial pressure, in consequence of this occupation from day to day of a wrong and one-sided position; and it was only cured by giving attention to this simple, but nevertheless important observation on mechanical principles. "In anomalous affections of the nerves, attended by disorder of health," Dr. Pidduck observes, "careful investigation frequently leads to a discovery both of the disease and its remedy. The shoemaker, for instance, may suffer from constant gastralgia, owing to the pressure by the last on the epigastric region. The clerk may suffer from pain in the left hypochondriac region, from pressure against the desk. Pain may be felt in the knee-joint from pressure of a garter.† Headache may result from occupations which occasion a constant drag upon the cervical region, in consequence of the stooping position of the head, as in milliners and other needlewomen. Pain

* Dr. Dumontpallier's paper upon "The Local Therapeutics in Analgesia, produced by stimulation of the corresponding region on the opposite side of the Body."—"Le Progrès Médical," Nov. 15, 1879. "The Practitioner," February, 1880.

† Headaches have been traced to the wearing of tight garters. See "Kinésithérapie," 1847, p. 88, note from p. 85.

may be felt in the arms and hands from sleeping on the back with the arms crossed over the head. Pain and loss of power may be produced in the fingers and wrists by grasping the pen too firmly in writing. This generally happens to persons whose handwriting is good, but whose hand has become unsteady. The firm grasp of the pen is for the purpose of steadying the hand. It is probable that to this cause, viz., holding the brush, rather than to the poison of lead, the wrist-drop of house painters may be owing. Pains in the larynx and hoarseness of voice may be occasioned by reading aloud, and preaching with the head bending over the desk or manuscript. Cases of this kind (clergyman's throat) are of frequent occurrence; they are not amenable to remedies, but they speedily cease on avoiding the existing cause."*

233. Dr. BOUCHARDAT,† in his important and exhaustive volume on "Glycosurie ou Diabète Sucré," maintains the same opinions as to the importance of the use of gymnastic exercises in glycosuria, as those which he has already expressed in former memoirs on the subject since 1846. In the whole article "On Violent Exercise (exercise forcé) as a Basis of the Treatment of Glycosurie" (pp. 222—240), there are very interesting remarks made, and facts related on this important subject. Thus Dr. Bouchardat observes on the weakness which is common in patients suffering from glycosuria: "As regards this special condition, it cannot be said that our instinct is always a good counsellor. Here is a patient to whom every movement is insupportable, and for whom, however, when his forces are increased by appropriate alimentation, exercise is the very sheet anchor." Dr. B.

* "Medicina Mechanica." By Isaac Pidduck, M.D. "The Lancet," Oct. 4, 1851.

† A. BOUCHARDAT, "De la Glycosurie ou Diabète Sucré. Son traitement Hygiènique." Paris, 1875.

thinks gymnastics in a modified form, and especially exercises of the arms, the best means to counteract the waste which accompanies this disease, and which increases in spite of a strict regimen. He recommends making the exercises attractive, and mentions gardening, outdoor exercises, strong walking exercises for several hours, shooting, fencing, in fact exercise in general, in order to increase the cutaneous and pulmonary action. After describing a case in which Dr. B. had recommended the daily practice of gardening, in which the pickaxe also was assiduously used, he says, "his patient came back from the country, after three months' practice, and an appropriate diet, in full health." Eight days, with severe regimen and exercise, have in some cases made the glycosuria disappear. Cases are mentioned in which exercises had made sugar disappear in the urine after three days. There is much to learn from this important work, even on an hygienic mode of treatment of disease in general; a subject mentioned by the late distinguished physician, Sir John Forbes, who considered that the principle of *training* should enter into the plan of treatment in chronic disease.

234. Diabetes, viewed in relation to the effects of muscular efforts, has been ably treated in a pamphlet of Dr. KARL ZIMMER.* Instructive cases are appended in which muscular efforts (principally walking in mountains, "Bergsteigen," but even Turnen) have seldom failed in diminishing the quantity of sugar in the urine. The author considers Dr. Külz to have been the first who has thoroughly examined the effects of muscular exertion in diabetes, and who has proved that it can be "either useful, hurtful, or indifferent." Dr. Zimmer states it as his conviction "that careful muscular efforts directed to all the greater groups of muscles, and in combination with an abundant meat diet, are able to com-

* "Die Muskeln eine Quelle, Muskelarbeit ein Heilmittel bey Diabetes." von Dr. Karl Zimmer. Karlsbad, 1880.

pletely cure many cases of diabetes." He gives among others the following theory, to explain the effect of muscular efforts in this affection: "By muscular exertions we diminish, in the first instance, the quantity of blood in the abdominal organs, especially in the liver, and determine it towards the muscles. But in the proportion that the blood quantity is diminished in the former, it becomes greater in the latter. A greater quantity of sugar passes accordingly with the blood to the muscles, and undergoes conversion in the process of assisting to produce the mechanical force and heat. We see, therefore, in diabetic patients, that the muscles not only completely use up the sugar, with which they themselves are loaded, but also sugar in the blood, even when this, in consequence of defective hepatic action, is abnormally rich in sugar. This conversion is so complete that the quantity of sugar in the blood is kept within normal limits."

235. "Is it not," says PORTAL,* "in consequence of the connection existing between the external nerves of the abdomen and those of the stomach and the intestines, that we can explain why light frictions on the umbilical region should tend to produce relief of the bowels," adding, "Une dame que j'ai connue s'est plusieurs fois purgée par ce moyen, et a evité de prendre des potions purgatives que je lui avais ordonnées." Frictions on the lower part of the abdomen with oil have in young children produced the effect of a vermifuge.

236. Frictions with oil have been found very useful in emphysema of the lungs, used for the purpose of lessening the susceptibility to fresh catarrhal affections." †

* "Cours d'Anatomie Médicale," par Antoine Portal. Paris, 1803. Vol. IV. p. 262.

† Laennec's "Abhandlung von den Krankheiten der Lungen und des Herzens, übersetzt." Von Fried. L. Meissner. Vol. I. p. 243.

237. In regard to position, PORTAL* has chiefly the following observations (in addition to what has previously been said on this subject): "It is useful, when some muscles have lost their power, to change the position, to vary one's exercises, in order to bring other muscles into play; great advantages result in the treatment of disease, even from this change of position, made for the purpose of producing the relaxation of this or that muscle. For instance, it is necessary in order to reduce an inguinal or umbilical hernia, &c., that the patient should lie on his back with the legs drawn up, the head and the pelvis elevated by cushions. A prolapse of the womb is much more easily cured in a woman who remains in a reclining posture than in one who continues to walk or to stand. A sharp pain in the chest is sometimes relieved by lying on the painful side. In inflammation of the trachea the patient breathes more easily whilst sitting with the head bent forwards. Pains in the head, drowsiness, convulsions, even epilepsy, are diminished when the hand of the patient is kept high and elevated. Asthmatic persons breathe more easily when they are sitting, whilst, on the contrary, patients who are very weak, who are in a fainting state, should at once be placed in a horizontal position on the back. Such as are tormented by sharp pains in certain forms of colic place themselves on the stomach in order to find relief."

238. In reference to what has already been mentioned about the gymnastic treatment in affections of the heart, the following notices will be of interest as carrying with them a great authority. Dr. W. STOKES, in his valuable and important volume "On Diseases of the Heart and the Aorta," recommends "a system of graduated muscular exercise" in the treatment of fatty degeneration of the heart. He says:

* Op. cit., Vol. II. p. 398.

"It will often happen that after perseverance in this system the patient will be enabled to take an amount of exercise with pleasure and advantage which at first was totally impossible, owing to the difficulty of breathing which followed upon exertion." Having observed that this treatment is more suited to the case of young persons than in those advanced in life, he continues: "The symptoms of debility of the heart are often removable by a regulated course of gymnastics, or by pedestrian exercise even in mountainous countries."* In a note Dr. Stokes adds: "It appears that the effect of pedestrian exercise is twofold, and that it not only increases muscular energy and development, but also, by augmenting the secretion from the skin, assists in carrying off a large quantity of the oily constituents of the system. Of the beautiful effects of pedestrian exercise upon the weakened heart in young men, I have seen the most remarkable example in persons who had spent the summer walking through the Alps, who whilst during the exercise were under constant perspiration."

239. In addition to what has been already advanced, and as a help in explaining the curative effects of Kinetic treatment in affections of the heart, the following observations may have some interest: "The whole question as to the applicability of Kinesis even in the gravest forms of heart disease, or its contra indications, is in close connection with the fact known among physiologists, as well as indeed to every one else, that corporal exercise excites the action of the heart. Manuals on physiology do not neglect to mention this fact, and to explain it. But its very familiarity, as recognised from time immemorial, has probably been the reason that physiologists have overlooked another fact, viz., that this effect is not the *only one* that follows *all* active movements, without

* "The Diseases of the Heart and the Aorta." By William Stokes. Dublin, 1854. P. 357.

exception. It has been reserved for the Ling method to show in hundreds of cases, that there are some forms of movements which can be so combined with others, that they become able to modify an augmented or excited action of the heart, even without accelerating the respiration. Among the entirely passive forms of movements might be mentioned, for instance, chest-lifting in sitting or recline-lean-sitting position, hypochondriacal friction, the left-arm vibration, &c. Another co-operative means, subserving the same purpose, is afforded by some active, derivative forms, as foot rotation, leg extension, and others. As far as the writer knows, the distinguished surgeon, Mr. WARD, is hitherto the only one, beyond the immediate followers of Ling-Branting, who has observed a diminution of the frequency of the pulse as a result of exercise. He says (p. 164), "The influence of exercise in diminishing the frequency of the pulse is not undeserving of notice in this place. In the case of a young gentleman, whom I directed to use considerable muscular exertion, the first effect was to produce a considerably increased quickness of the pulse; at the expiration of a quarter or half an hour, however, when the immediate acceleration from exercise had abated, the number of beats was reduced twenty and thirty in a minute. The same effect I have also frequently witnessed in adult age. In a gentleman of forty years of age, whose pulse had regularly, during two years, beat ninety strokes in a minute; it fell to eighty, and subsequently to seventy-five, on using daily strong muscular exercise."*

It is a pity that Mr. Ward has not given any details as to the quantity or quality (kind) of exercises used. His observation seems to tally with the interesting results derived from experiments made by Captain O. Petersen in Christiania, in 1877, and reported in tabular forms as to the effect of different gymnastic exercises for healthy persons (compare Prof.

* "Practical Observations on Distortions of the Spine, Chest, and Limbs," &c. By W. Ward. London, 1822.

Hartelii periodical, 1879—1880), which seems to modify the accepted idea among Kinetic practitioners as to the results of some types of hitherto used "derivative movements."

240. From the earliest times of Ling's gymnastic experience the effects of appropriate movements in enlarging the thorax and pulmonic capacity, have been observed, and their importance duly estimated.* The fact has been mentioned in these jottings, that the Ling-Kinetic treatment has at its disposal a variety of important active forms of movements (especially the group called chest tension), to produce these effects; and not a few important cases and observations in proof of these effects have from time to time been published. These effects and their importance seem, however, until lately to have almost escaped the attention of the profession in general. It is therefore of interest to record opinions and facts of an opposite character. So, for instance, in Mr. Ward's remarkable work on distortions of the spine, chest, and limbs, will be found, p. 75, the following interesting observation: "The method which I have employed with regard to the local means to be used in those cases where the

* In illustration of these facts, the following rather amusing incident, related to the writer many years ago, might be mentioned. In about 1816 Ling, wishing to demonstrate the importance of the introduction of gymnastics in the army, had obtained permission to show the effect of his method on some thirty men of the horseguards stationed at Stockholm. The mensurations round the chest and waist were made at the commencement and recorded. After about from three to four months, when they were going to be inspected by the military authorities, they were re-measured, and were all told of the improvement which each man was to state, when they were passed in review. All were very much struck with the suppleness, smartness, strength, and endurance of the men, and at last when Bernadotte, who, as crown prince, was present, passed along the ranks, each man had to call out, "so much wider across the chest, so much smaller round the waist," when one getting flurried, shouted, "two inches less about the chest, three inches stouter round the waist," this mistake causing great amusement among all that were present.

spine has been exempt from disease, has been that of putting the intercostal muscles and those connected with the anterior part of the chest on the stretch, by placing the patient in a standing position, with the back against a cylindrical piece of wood, and the arms extended backwards. By this means an extension of the pectoral muscles is produced, and they are thus brought into full action upon the ribs as well as the muscles of the abdomen, which are opposed to them. The position, as well as the condition of the muscles, may be imagined by that of a person in the act of attempting to throw a somersault backwards. While the patient is in this situation he is desired to take deep inspirations. I direct manipulation, and afterwards percussion, to be employed for one or two hours during the day, gradually increasing them in force according to the influence produced on the patient. In addition to these means I usually direct the patient to suspend the body by the arms, and similar modes of exercise, with a view to promote the full action of the pectorales, serrati magni, and postici muscles, &c., on the ribs, to produce the greatest possible extent of elevation of the ribs and sternum, and consequent expansion of the chest."*

241. Dr. BLAND RADCLIFFE, in his lectures "On Epilepsy, Pain," &c., says, sec. 104: "There is reason to believe that suitable gymnastic exercises are very beneficial in many chronic convulsive cases." Having mentioned that he has found undoubtedly good results from gymnastic exercises, "in several cases of epilepsy, chorea, and hysteria," he goes on to say, "I have at present a case under treatment in which good seems to have been done by adopting a practice recommended by Dr. Henry Silvester in the treatment of consumption,† a

* The eleven cases which are added are of much interest, and prove a considerable increase of girth of the chest as a consequence of the method employed.

† "The Physiological Method of Treating Consumption." Churchill, 1862.

practice which may perhaps be brought under the head of gymnastics. Having ascertained that the mere dead weight of the arms has the effect of reducing the amount of air which can be taken into the chest, to the extent of ten cubic inches, or thereabouts, Dr. Silvester proposes that a phthisical person shall now and then eke out his insufficient respiration by breathing in such a manner as to get rid of this weight—by breathing, that is to say, with the hands taking hold of something fixed at a sufficiently high level, or what answers the purpose still more easily, with the hands clasped together and resting upon the top of the head.* And this proposition appears to have much to recommend it, not only in phthisis, but also in other cases in which, as in epilepsy, the respiration is wanting in activity. I also think that a collateral argument in favour of gymnastics may be derived from Dr. Silvester's investigations upon artificial respiration; for these investigations show that as much as from nine to forty-four cubic inches of air may be made to pass in and out of the chest by merely pulling the arms upwards, and then bringing them back to the sides, and that this movement of the arms is in itself a mode of performing artificial respiration which is more effectual than any other. Of course the beneficial influence of gymnastics is not confined to the respiratory function. On the contrary, this influence tells equally upon the circulatory and upon all other functions, as it indeed must do if it act in this manner upon the respira-

* It is not principally by getting rid of the weight of the arms that the breathing is facilitated, but rather through the elevation of the thorax by the raising and fixing of the arms above the head (see p. 79). The observation of Dr. Silvester is in full correspondence with what is obtained in the kinetic practice, in which the often employed half-active and active forms, viz., heave standing chest-tension, stretched sitting chest-tension, head fixed sitting chest-lifting, stretched arch sitting arms bending with inter-scapular pressure, etc., seldom fail in producing easier breathing, and an increase in the perimeter of the chest.

tion, for the activity of the respiration is a fair criterion of vital action generally."*

242. As a reaction from a former state of indifference to the medical gymnastic treatment, it appears in some countries to be a growing opinion amongst the members of the profession, that passive movements are the most favourable for the development of muscle and strength after convalescence, &c. The following old opinion of PORTAL† as to the value and effects of active exercises, is therefore here introduced: "Exercises not only increase the volume of the muscles, but increase also their power." Having observed "that the *faiseurs de tours de force* acquire their great strength only by the repeated exercises of certain muscles," he continues: "In this way it is possible to derive great advantage from exercises used in order to give strength to limbs which, through inaction, have become enfeebled and enervated. You must prescribe exercises to delicate persons, but they should only be used gradually. I have seen atrophied limbs regain muscle and power by exercise, aided at the same time by a good regime. Every-day experience

* Whilst this work has been passing through the press, an interesting pamphlet by Dr. A. Dally and Dr. A. Chassagne, "Influence précise de la Gymnastique," has been published. Among other noteworthy effects, the most decided proofs of the influence of gymnastic exercises on the increase of the perimeter of the thorax have been furnished by a great number of mensurations (16,300 observations, principally on soldiers). What has chiefly struck the writer is the observation that a notable slowness (*ralentissement*) of the breathing, or in the respiratory movements of the thorax (the respiration at the same time becoming deeper), has resulted from the exercises; so much so, that at last even running exercises produced but little influence on the acceleration of the breathing.

Dr. Marey and Dr. Hillairet have verified the fact, that through gymnastic exercises the impressionability of the heart when under the influence of running has been gradually diminished.

† Op. cit., Vol. II. p. 405.

proves that nothing more speedily re-establishes convalescence than mild bodily exercises, gradually increased. Often the blood and the humours, which ought to be directed to the external parts, accumulate in the internal organs of the body from want of exercise." It is true that Ling has signified that in some cases the kinetic treatment should *commence* with passive movements alone, especially of the kind which in modern writings are called massage (frictions, kneadings, &c.), and that he only gradually recommended the use of active movements. It is also worthy of remark that in some parts of Russia the method of Swedish gymnastics has gradually been transformed into exclusively passive movements, partly massage, partly other passive forms. Besides it has already been mentioned that, in many instances, certain passive forms, such as riding in a carriage, vibrations, &c., have produced favourable results, without being accompanied by active *subsidia suppeditativa*. And finally it should be mentioned that some other passive movements, as for instance, *tense standing*, transversal abdominal frictions, at the commencement of a kinetic treatment, generally produce a prompt effect on the bowels, but this effect often disappears when a few active movements have been introduced. However, in the majority of cases it has been observed that, as a general rule, the efficacy of the passive movement is maintained and increased by an appropriate grouping of active movements, before or after, as the case may be. Nay, it has been amply confirmed by many years experience that in some cases certain passive forms of movements can be used without danger, only by the previous introduction of some active movements, "derivative," or others. This applies, besides other cases, especially to affections of the heart, the lungs, and the brain, &c.

243. Mr. CHERVIN in France, remarking that stammering is a kind of chorea of the muscles of respiration and

phonation, advises slow and measured gymnastic exercises of the respiration, and combats the unruly movements of the tongue and lips, by subjecting them to muscular exercise. ("The Lancet.")

244. Mr. E. SCHEUTZ (fils), of the celebrated calculating machine notoriety, when suffering from boils in the axillæ, to which he was subject, "was instinctively led to make rotatorial swinging motions with the arms, by which his boils were cured, and by which he always prevented their return" (communicated to the writer in 1859).

245. Mr. C. HUNTER has observed the practical value of prone respiration in disease. ("The Lancet," June 18, 1859.)

246. In a case of angina pectoris, as recorded by Dr. PAVEY, the sufferer was in the habit of resting on a full inspiration, as it afforded a momentary relief to the uneasy sensation in the chest. HEBERDEN observes that the patients obtain ease "by straightening the vertebræ of the thorax."*

247. Dr. RAMADGE, in his "Consumption Curable," has shown by numerous cases the remarkable effects of inhalation, so that a greater interest is associated with this method than it has hitherto received from the profession.†

Dr. R. attaches more weight to the effect of the respiratory and especially expiratory efforts obtained by the construction of the inhaler, than to the substances inhaled. He says, "I have never known inhalation fail when resorted to in incipient stages of consumption." He recommends it to be used two or three times daily for half an hour each time.

* Stokes, op. cit., p. 487.

† "Consumption Curable. The manner in which Nature as well as Remedial Art co-operate in Healing,—and a Mode of Treatment." By F. A. Ramadge, M.D. 2nd Edition. London, 1834.

He says he has often found the circumference of the chest increased one inch after the first month of inhalation." Dr. Ramadge attaches (as has been observed) more importance to this effect than to the substance inhaled, which is generally hot water, though other substances are also mentioned.*

248. Dr. S. GUIRETTE's work, "Guérison de la Phthisie Pulmonaire Tuberculeuse par la Gymnastique Pulmonaire,"

* It has already been mentioned in the prefatory remarks that it was originally the writer's intention that these extracts from the medical literature should serve as an appendix to a translation of Ling's posthumous work, "General Principles of Gymnastics." Consequently there could not be any necessity for referring to the experience gained at the Gymnastic Central Institution, or to the writer's own casuistic abroad since 1846.

The number of observations quoted from medical authorities prove that Kinetic applications in various morbid affections, when brought together, greatly outnumber, both in their varieties and forms, the diseases for which Ling and his nearest followers directed their treatment. This is the shortest argument against those opponents, who have maintained that Ling intended to make a universal medicine of his medico-gymnastic system.

Ling, for instance, considered that in acute diseases the mechanical agency should be essentially limited to attending to the position of the patient; in fact, be of a secondary or negative character. There is, however, reason to believe that the kinetic treatment may with advantage be applied on a wider basis to some forms of acute cases. Some gymnasts believe themselves to have found that the kinetic treatment has proved useful in diseases such as scarlatina (see also Drs. Taylor and Schneeman art. p. 166), puerperal fever, diphtheria, &c. The writer is slow to give credit to assertions like these, unless indeed time should thereby be gained for the elimination of the respective specific poison. However, in some forms of bronchitis and pneumonia, to give an instance, where in the last stage chemical medicines have failed in producing the desired effect, it might not be unreasonable to expect that gentle vibrations, percussions, frictions, pressure on the pneumogastric nerve, &c. (in such positions as the patient's condition would permit), might, on the one hand, help in causing resolutions, &c., and on the other, by assisting expectoration, to relieve the smaller bronchial tubes, loaded with mucus. A case of acute pneumonia, successfully treated, in 1847, by Branting, seems to encourage imitation.

may also be consulted with advantage on account of the appended casuistic.

249. WOODALL, a most intelligent and accurate observer, says Dr. Martin Paine (see "Med. and Physiol. Comment," t. ii., p. 49), "states that the best remedy for syncope is to obstruct respiration entirely by momentarily confining the nose and mouth."* It is a custom among the peasantry in Sweden, when a horse has loud breathing from being overdriven, to lay hold of the nose and compress the nostrils for a few seconds; the horse makes a rushing noise, and is freed from its oppression for the time being.

250. Dr. NÉLATON† makes mention of the Kinetic treatment, à la Ling, in deviations of the spine. Having passed in rapid review such authors as have written on the subject of spinal deviation and its treatment, from Ambroise Paré, Andry, Levacher, et Venel, Shaw and Bamfield (in England), Pravaz, Delpeche, to Guérin, Bouvier, Duchenne de Boulogne, Bouland and the treatises of Neumann and Eulenburg, he observes in reference to the two last-named authors, that "they have especially devoted themselves to making known the method of the Swede Ling, a method which, as we know, consists in making use of the muscular forces for therapeutic purposes." P. 428 a few movements are mentioned, for the purpose of straightening a lumbar curve (Duchenne). Further on the author says, "Mr. Bouland, who has had much practice in the exercises of the Swedish gymnastics (?) attaches great importance to voluntary movements, the object of which is to bend the trunk obliquely backwards on the side of the convexity." This is in correspondence with a general rule laid down by Ling in the

* "Experimental Researches applied to Physiology and Pathology." By E. Brown-Sequard, M.D. 1853.

† "Elements de Pathologie Chirurgicale." P. A. Nélaton. 2ieme Edition. Paris, 1874. Tom. iii., p. 404.

treatment of spinal deviations, viz., always to attempt to increase the power in the relaxed muscles (see also Gen. princ. of Gymn). In a work so comprehensive as that of Dr. Nélaton's, it cannot be expected that we should find details of treatment of this nature. A considerable step in advance has been gained in the fact that the sanction of so great a surgical authority as Dr. Nélaton has been secured. The progressive development of the orthopædic treatment shows in general that in the same proportion as the use of machines has become milder and more infrequent, the use of the gymnastic treatment has been increased, especially in relation to the treatment of deformities of the spine.

251. Dr. Le Blond has published a volume on hygienic and medical gymnastics,* the importance of which is enhanced by an interesting introduction written by Dr. Bouvier, the celebrated orthopædic physician and member of the Gymnastic Committee at the Ministry of Public Instruction in France. In this introduction Dr. Bouvier says: "Since the commencement of my medical career, struck by the use of gymnastics in the double point of view of hygiene and therapeutics, I have devoted a part of my efforts to rescue from oblivion a branch of so much importance for medicine." Dr. Le Blond's book is subdivided into three principal divisions: 1, Descriptive Gymnastics; 2, Hygienic Gymnastics; and 3, Medical Gymnastics. The doctor has evidently devoted much pains to the representing of the subject in these three aspects, and he also makes reference to the Swedish treatment in general. But in respect to the technical operations

* "Manuel de Gymnastique Hygiénique et Médicale, comprenant la description des exercises du corps et leurs applications au developpement des forces, à la conservation de la santé et au traitement des Maladies, par le Dr. W. A. Le Blond avec une introduction par H. Bouvier, membre de l'Academie de Médécine et de la commission de gymnastique du Ministère de l'instruction publique." Paris, 1877.

which this treatment contains in so large a number of types and effects, most different in character, he gives no description; he simply generalises on those points which constitute links between general physiology and gymnastics. In relation to deformities, it would have been more desirable to have had descriptions, as the author seems to have an interest in this branch. But even in the descriptions of the few orthopædic exercises, "*dit Suedois*," which are referred to, some are incorrectly given. In fact, whilst the historical part manifests great learning, both historical and physiological, a true Kinesiology is wanting; and little has been done in France since the publishing of the writer's *Kinésithérapie* in 1847, a work Dr. Le Blond entirely ignores.* Having in the second part, "*Hygiène des exercises du Corps*," shown the importance of gymnastics during the different periods of life, in reference to sexes, temperaments, &c., Dr. B. proceeds in the third part, "*Gymnastique appliquée à la Médécine*," to specify the diseases in which, according to him, the gymnastic treatment should be used. He observes: "Notwithstanding the remarkable works of Benoiston de Chatauneuf, Lombard (de Genève), Blache, Sée, Bouvier, Bonnet (de Lyon), and Bouchardat, many medical men seem to ignore the very important benefits which medicine ought to derive from a serious study of the science of movement, as applied to pathological affections." As one of the causes of their distrust felt in relation to the new remedy, he mentions the great ignorance of the gymnasts. "L'imperfection des méthodes, l'incapacité et l'insuffisance des maîtres, voilà les véritables causes qui font que les exercises du corps sont si

* According to the latest news from France in reference to gymnastics, a new law has been promulgated by M. Ferry, Ministre de l'Instruction Publique, which enjoins that gymnastic exercises shall be used in all the public schools throughout the country. It is to be hoped that the execution of this law will be more real than that of the laws issued for a similar purpose in 1854 and 1869.

rarement commandés par les médécins." He consequently regrets that the Swedish method is so little known in France. Dr. B. further recommends the introduction of gymnastics into the hospitals in both its principal forms, the active and the passive; and he also proposes the use of gymnastics in the treatment of neuroses, viz., in tetanus, in epilepsy, in hypochondriasis, in mental affections, in gastralgia, in asthmatic affections, in scrofula, pulmonary phthisis, cancer, obesity, dropsy, in gout and gravel, rabies, syphilis, and deformities. This register contains a considerably greater number of affections, which Dr. B. thinks should fall under the kinetic form of treatment, than that which the writer communicated in 1847, and which was then considered by far too large. In each of these groups of affections, however, Dr. Le Blond gives satisfactory grounds for his opinion as to the applicability of the gymnastic treatment, which are well worth the consideration of those interested in the subject.

It was originally the writer's intention that this, the therapeutical part, should end with a short *aperçu*, representing the different phases of the orthopædic treatment, and the different methods of procedure made use of by the orthopædists of the old school, by whom the treatment was exclusively limited to passive forms (extension, pressure, &c.), such as Harrison, Sheldrake, L. Beale, Hare, Amesbury, Stafford, Tamplin, Epps, Broadhurst, &c., in England; Heidenreich, Wildberger, Shilling, &c., in Germany; Guérin, Langaard, &c.,—and of those who also in their respective modes of treatment recommend or make use of exercises as a part of the cure in spinal deformities, namely, Andry, Delpeche, Jalade-Lafond, Pravaz, Bonnet, Malgaigne, Bouvier, &c., in France; Ward, Dodd, Shaw, Bampfield, Bishop, Coulson, Lonsdale, Little, Cole, Adams, Barwell, &c., in England; Eulenburg, Schreber, Schildbach, &c., in Germany; Drachmann, in Denmark; Akerman, Sätherberg and Jäderholm in Sweden. Such a survey should also have noted the distinction

between the modern surgeons and orthopædists, who make use of gymnastics, properly speaking, according to a certain method, or according to a mixture of several methods. But the differences in the methods adopted by different authors are so many, and often so slight, that any classification would be difficult, and under any circumstances voluminous, and they must therefore be passed over, as belonging to another kind of publication than the present one. The following remarks may however be made, as connected with the literature of this special subject, by way of showing to what extent opinions have differed. Not feeling satisfied with the exclusive use of machinery, however complicated and severe, various authors introduced, as accessories, gymnastics in various forms, as well as other curative measures. The gymnastics which were used contained forms of movements quite different from those which have more recently been described, although far from completely, by Dr. Eulenburg and others.*

So, for instance, even as lately as 1838, Dr. König made use of battledore and shuttlecock, rotatory wheels, pullies, etc.;† and Dr. Schreber, in 1852, of bar and leaping exercises, the rotatory wheel, the Glisson swing, hanging positions with one or two hands, etc.‡

When German authors made mention of the different localised kinds of movements used at the Central Institution in Sweden in cases of deviations of the spine, in which they were considered to be more precise in their effect, according to the kind of deformity, this claim was met with universal doubt and denial; and indeed one may be excused for being sceptical, as it regards any *curative* means applied to the treatment at least of certain forms of spinal deformity.

* Dr. Eulenburg, "Mittheilungen aus der Orthopädie," 1860. Also Neumann, op. cit., etc.

† F. König, "Andentungen über die Seitwärts biegung des Rückrather," 1838.

‡ Op. cit.

Here, if ever, it is a question, *first*, of careful selection; *secondly*, of careful execution of the movements selected; and *thirdly*, of sufficient repetition of the same.

Mr. De Ron, of Russian celebrity (p. 125), who has great experience in the treatment of deformities, contractions of joints, etc., maintains that the treatment by movements should be repeated several times a day, an opinion with which the writer fully accords, at least, in severer cases, as for instance, hereditary scolioses, etc. "Gutta cavat lapidem non vi sed sæpe cadendo." This repetition is, however, often attended with great difficulties. In recent cases of lateral curvature of the first and second degree, the treatment has succeeded well by the course of movements having been applied only once a day. In complicated and confirmed cases of longer standing, an improvement can generally only be obtained by frequent repetitions.

As a general rule, the maximum of improvement ("redressement") that can be obtained seems to correspond to the degree of mobility of the spine, which can be produced by the united volitional effort of the patient, and the pressure of the surgeon's hands, in an opposite direction to the curvature. Such an artificial momentary *redressement* the treatment generally succeeds in rendering permanent. Experience alone will show whether renewed repetitions, say three or four times a day, will succeed in carrying the improvement further.

The most pessimist opinion as to the use of the Kinetic treatment in spinal cases, excepting perhaps that of Dr. Werner,* is that of Dr. Schilling. Dr. W. comes to the conclusion that neither gymnastics, the Schwedische Heil-gymnastic or other, nor the orthopædic treatment, is of any avail in "Scoliosis habitualis," in which case Dr. W. allowed the latter to produce at the best only a slight improvement.

* Dr. Werner, "Reform der Orthopädie in 60 Thesen durchgeführt." Berlin, 1857.

Dr. Schilling,* on the contrary, maintains that gymnastics, instead of being useful, only retard or prevent the cures, which can be obtained by machines alone. If other evidence were necessary, this of itself would be enough to show with what a degree of incorrectness he has applied and executed the forms of movements that should represent the Swedish method. But arguments would be wasted when employed against an author who denies the simple fact that muscular efforts or exercises favour muscular development and power. According to the writer's experience, though he has found that as regards spinal deformities, the old adage, "prevention is better than cure," especially holds true; and that educational and hygienic gymnastics is such a preventive *par excellence*, yet he has not met with a single case in which improvement in a greater or lesser degree has not been brought about by the *Lingism* alone. Deviations of the spine have, as is the case with many other affections, a curable and incurable stage. In hereditary scoliosis, of long standing, the writer's aim has not been to produce curative results, but simply to strengthen the spine *in statu quo*. The patients have generally, after some months, been able to do without the iron supports which, to say the least, they had been using for years with great discomfort and pain. Finally the writer would direct attention to Mr. Barwell's novel and ingenious method in the treatment of spinal deformities, club foot,† &c., as affording in the writer's opinion, the safest and best auxiliary to a specific treatment by movements in similar cases. It ought perhaps to be added that Professor Hartelius has, with much success, in accordance with the

* "Die Orthopädie der Gegenwart." By Dr. Schilling. Erlangen, 1860.

† "The Causes and Treatment of Lateral Curvature of the Spine." By R. Barwell, F.R.C.S. London, 1860. "On the Cure of Club Foot without cutting the Tendons, and on certain New Methods of Treating other Deformities." By R. Barwell. 1865.

once-established practice by Ling and Branting, at the Central Institution, continued to make use of the Kinetic form of treatment alone in deviations of the spine.

Dr. Kjölstad, of Christiania, in his "self-erecting method," makes use of no orthopædic instruments or stays. Among the older authors, such as Ward, 1822, and Dodd, 1824, active and passive movements are recommended as *the* treatment in similar cases.

SOME PATHOLOGICAL OR PATHOGENETIC EFFECTS OF MECHANICAL AGENCIES.

In the previous pages physiological and curative effects of agencies of the mechanical order have been cited. It is of undoubted interest to compare with these the effects of the same kind of agency, when used either in an excessive degree, or in a wrong form. A little more or a little less of the same form of mechanical agency will often decide whether the effect will become pathological and traumatic, on the one hand, or physiological and curative on the other.

The pathological effects of accidents, violent or continued efforts, overstraining, blows, shocks, continued pressure, one-sided and awry positions, teach lessons of interest as to the present subject that ought not to be overlooked; and if treated comparatively, and by the aid of the rich materials that the medical literature and the weekly medical journals afford, would tend materially to its elucidation. It might be stated as a general rule that the organ which has been subjected to the injury becomes a focus of disease, in accordance with its physiological functions, unless by re-percussion the

effects have radiated and become located in a direction more or less opposite to the blow. These characteristic differences afford additional proofs of a specific organic effect, infinitely varying in degrees in different individuals; and they form, as it were, fragments of a mechanical toxicology, if such an expression may be used.

1. Brain disturbance is generally due to an action on the cranium itself; but there are cases in which it is owing to a sudden shock to some other parts of the body, as, for instance, a blow on the chin, a fall on the feet (when the knees are kept straight), on the knees, or on the extreme part of the back (sur les fesses).—Nélaton.

"Everybody knows that the first point to be observed in jumping exercises, especially from a height, is to bend the knees, in order to avoid a shock to the brain" (Nélaton). "Inguinal and crural hernia may also be caused if the knees are not bent in jumping" (Ling and others). "The first signs of a slight disturbance are characterised by a sudden étourdissement, the patient seeing fiery objects and sparks before the eyes, ringing in the ears, with humming and confused noises, and a sudden '*résolution*' of the muscular system. After a few minutes the patient who has been stunned without falling, has on recovering himself, lost most frequently all remembrance of the accident. When there is coma it is only of short duration, at the utmost half an hour. Sometimes during the state of collapse there are involuntary emissions of urine and fæces, sometimes also vomitings. These symptoms are aggravated and last several days, when the disturbance has been of a more serious kind; until in the most intense form the injured person falls deprived of motion and sensibility, without pulse and scarcely any breath. Sometimes the patient dies instantaneously, sometimes after a few hours" (Nélaton).

2. Dr. BOYER mentions a case of "a woman in circumstances of brain commotion, who was delivered of a child without knowing anything about it, and after her lethargic sleep had no remembrance of what had occurred" (Nélaton).

3. Dr. NÉLATON mentions the following groups of symptoms consequent upon disturbances of the brain :—

A. *Fixed Pain in the Head.*—Similar cases reported by Morel, Scultet, Gervais, Quesnay, &c.

B. *Epilepsy*, observed by Marchettes, Dudley, Boucher, Lamotte, Boyer, A. Bernard, &c.

C. *Polyuria et Glucosuria*, observed by Cl. Bernard, Bauchet, Fisher, Zokalsky, &c.

D. *Arthropathies*, observed by Charcot, Brown-Sequard, Hitze, &c.

E. *Amblyopia*, in one or both eyes; diplopia, deafness, noise in the head, vertigo, cephalalgia, cerebral congestion.

F. *Anosmia.*

G. *Mental Disturbance*, e.g., weakness of the intellectual faculties, in some cases almost complete imbecility (Dufour). Bauchet has reported an observation of a patient who was able to calculate (arithmétique) with greater facility after this kind of cerebral concussion. Weakness of memory, a kind of aphasia, consisting in forgetfulness of words. Melancholy, nay even madness in all its forms, following after a shorter or longer interval of traumatic affection of the head.

4. Dr. NÉLATON mentions a case illustrative of the effect of a sharp jerk brought to bear on a point of the spinal column. "A young man was quietly standing and talking to a friend, when another came behind him, and passing his two arms under the axillæ, united both his hands behind the head, thus forcing it violently forwards on the trunk. The result of this practical joke was, that the young man fell sud-

denly to the ground paralysed all over, which fortunately, however, did not last long." Another case is mentioned of a workman who had become hemiplegic, from elongation with a lateral inflexion of the cervical portion of the spine.

In disturbance of the spine, either through a fall on the feet, the knees, the sacrum, or the back, in violent collisions on the rachis, especially on the lumbar region, symptoms are produced very similar to those produced by cerebral commotion.

Dr. Nélaton continues: "when the disturbance bears on the dorsal and lumbar portion, no other mischief than effects on the bladder and the inferior members are observable."

5. Mr. ERICSEN has described the peculiar affection called "the railway spine," principally noteworthy as having its cause in railway accidents.* Constant travelling on the railway causes, by the continuous vibratory action, peculiar symptoms of affection of the spine.†

As has often been remarked, even slight blows on the eyes have caused blindness; on the ear, deafness. As an example, see the following extract from the *Lancet*, which may serve two purposes.

6. "The blindness of the late King of Hanover was occasioned, it is understood, by an accidental, but by no means violent, blow on the eye. Scarcely a day passes, we believe, without some schoolmaster (or schoolfellow, in imitation of his master) giving a lad a smart 'box' upon the ear. Few persons would be bold enough to choose the eye as a part upon which it was expedient to inflict a violent blow

* "Medical Times and Gazette," May 7, 1857.

† "On Concussion of the Spine, Nervous Shock," &c. By John Ericsen, F.R.C.S. London, 1875. LEUDET in France has also written on this subject.

by way of moral education, but there is apparently no limit to the number of those who select an organ upon which violence is liable to be attended with much more dangerous results. For not only is deafness caused by 'boxes,' which rupture (as they continually do) the drum of the ear, but the inflammation of the internal cavity, which is so frequent a result, may be followed by disease of the bone, giving rise to abscess on the brain, and having a fatal termination. Medical men alone can be fully aware how fruitful a source of suffering and danger is represented by the box on the ear. There are, for instance, under observation at the present moment, two schoolboys, who have been the victims of such an assault. Surely schoolmasters ought to have learnt long ere this, the danger of a mode of personal chastisement that has apparently usurped the place of others, which, if more disgusting, were not attended with an equal amount of peril." —*Lancet.*

The writer has known two cases of deafness in Sweden caused by a hard snowball on the ear.

7. Mr. DIXON has a case of amaurosis slowly supervening on a wound of the eyebrow.

8. Dr. WICKHAM LEGG has an interesting paper on anosmia following a blow.* The patient, a man, fell from a cart, on his head, and pointed out the right posterior parietal region as the seat of the injury. He was insensible for half an hour, and blood flowed from his left ear. There was no improvement after two months' observation, the smell being perverted, but not altogether lost, so also the taste.

9. Several cases of loss of smell, generally accompanied by more or less complete loss of taste, of traumatic origin, are

* "A Case of Anosmia, following a Blow." By Wickham Legg, M.D. "The Lancet," Nov. 8, 1872.

mentioned in the same paper. Dr. Wm. Ogle ("Med. Chir. Trans.," vol. iii.) suggests that, in cases of traumatic anosmia, the blow has generally fallen upon the occiput. In Dr. Rotta's cases ("Arch. Gen. de Med.," 1870, p. 385) two were caused by a blow struck on the crown of the head and two by a blow on the right ear. Molière and Hugling Jackson have also reported traumatic cases of anosmia. In point of treatment Dr. W. Legg thinks little can be expected from the medical art.

10. Dr. Vogt, of Norway, relates a case of aphasia from a fall. A girl, aged $8\frac{3}{4}$, had fallen in the summer of 1869 from a steep elevation ("fjeld") in Norway, after which a blue discoloration of the left temple occurred, and she became at once insensible. The next day she recovered her senses, spoke as usual, but complained of pain in the head. She became ill after a week, ceased gradually to speak, and in three weeks she was completely dumb. No other sign of paralysis. When examined in 1872 she was still entirely dumb, though different modes of treatment had been used. In other respects she was intelligent, and had made good progress in school. She made vain attempts to speak, but could only utter the sounds *a* and *o*.*

11. Epileptic convulsions have followed a blow on the head.† Brown Sequard mentions in his lectures in London, 1863, cases of epilepsy caused by a blow on the head.‡

12. Morgagni makes mention of a man, subjected to epileptic fits, who was struck on the head by a large piece of wood, after which the epilepsy much increased in severity, and in addition to this the patient became agitated by such

* "Northern Medical Archive." Vol. v., No. 8, p. 6.

† "Medical Times and Gazette," Nov. 26, 1868.

‡ "The Lancet," March 28, 1863.

violent and constant convulsive movements, that he was obliged to be fastened to his bed by bandages; at the same time he became amaurotic on both eyes.

13. An intimate friend of the writer, Captain V. of the Rifles of Vermland (Sweden), whilst out shooting, got into a brawl with some peasants, and received a stray blow on his forehead; about a year afterwards he became low-spirited, his mind became gradually affected, and two years after the accident he died stark mad.

14. At a post-mortem examination, at which the writer was present, ossification of the greater part of Falx cerebri was observed, as the putative result of a severe blow on the head with a hard instrument, a year or two before death took place. No traces of abnormal changes in the brain itself were found.

15. Dr. CHILDS, of New York, relates an interesting case of fatal apoplexy of the cerebellum from violently shaking the head. A young lady in the summer of 1853, to amuse a child shook her head violently a great number of times. Fainting and vomiting followed, and she staggered in her walk. She lost the power of walking, grew blind, and complained of a dull pain in the occiput. She died from convulsions in January, 1855.*

16. Dr. PLAGGE reports a case of traumatic diabetes brought on in a young man by a blow on the occiput.† (Nélaton.)

17. Dr. BUZZARD relates a case of glycosuria following cerebro-spinal concussion.‡

* "Boston Journal," vol. lvii., p. 536. *Med. Times and Gazette*, April 24, 1858

† Virshow's "Archiv," vol. xiii., p. 93.

‡ "The Lancet," May 6, 1876.

18. Dr. BOUCHARDAT mentions 18 cases noted by different observers, which were all caused either by blows on the head or neck, or falls on the head,* producing polyuria and glycosuria.†

19. Dr. TODD‡ had a woman under his care in King's College Hospital, affording an interesting example of the occurrence of saccharine urine after cerebral concussion. In the same article there is also mention made of another case observed by Dr. Goolden in a railway porter, who was violently struck on the occiput by the handle of a crane, and who became diabetic during the illness that followed. In neither of these cases was there any reason for suspecting that diabetes had been present prior to the infliction of the injury.

20. The following observation is interesting as affording an evidence of the nervous origin of diabetes, and is here referred to, especially as testifying to the influence of position in mechanically acting on the nervous centres, and influencing the chemico-vital phenomena of the organism. "A man was brought last session in whom the secretion of sugar could be increased by throwing back the head, looking upwards, and retaining his posture. The patient was a house painter, and had himself observed that the first symptoms always came on when he was in the act of washing or painting a ceiling;

* Claude Bernard showed some thirty years ago that if a lesion is made in the space between the origin of the pneumogastric and the auditory nerves, it produces an increase in the urinary secretion, and appearance of sugar in the urine. If the lesion is made a little above, urine becomes less abundant and less charged with sugar, but it contains albumen; if a little below the origin of the auditory nerve the secretion of urine is increased without either sugar or albumen.

† Bouchardat, "De la Glycosurie ou Diabète Sucrée, son Traitement Hygiènique." Paris, 1875. Notes, p. 107.

‡ "Medical Times and Gazette," May 15, 1858.

that he could paint at a wall for hours without any particular pain or oppression, but as soon as he mounted his steps and began to look upwards continuously, so soon the constant desire to micturate was developed. The giving up of this occupation caused a marked improvement in his case."*

Claude Bernard mentioned in his lectures (Paris, 1855) that mechanical (external) pressure on the liver causes a change of the saccharine state of the blood from the jugular vein. (Letter to the writer from H. Ling, fils, March 24, 1855.) Dr. ZIMMER observes that the increased quantity of sugar in similar cases does not depend on a pressure on the liver, but on violently increased muscular action, caused by the struggle of the animal experimented upon (Pavy).†

21. Addison's disease of the supra-renal capsules has been traced to a blow or strain.‡

22. Sir HENRY THOMPSON has a case of obliteration of the urethra, consequent upon a stricture, which followed a blow (or fall) on the perineum.§

23. Scirrhus of the pylorus and enormous enlargement of the stomach from a blow is mentioned in the *Lancet*.‖ "Th. S., aged 50, entered Exeter Hospital Nov. 23, 1848; had been in good health till four years ago, when he received a blow on the pit of the stomach. From that period, for two years afterwards, he had occasional pain in the stomach, and during the last two years constant pain, water brash, indigestion," &c.

* "Medical Times and Gazette," March 8, 1862.

† Op. cit.

‡ "On Addison's Disease." By Edward Greenshaw, M.D.—*The Lancet*.

§ "Transactions of the Pathological Society of London." Vol. v.

‖ "The Lancet," Nov. 10, 1849.

24. Mr. SIMON and Mr. SOLLY have some interesting cases relating to blows on the back as one of the causes of tetanus.*

25. Blows on the pit of the stomach, especially after a meal, have caused instantaneous death, the characteristic coagulation of the blood being at the same time lost.

26. Dr. PATIN describes six cases of "ulcus rotundum ventriculi," in which persons formerly healthy, directly after a blow on the epigastric region, began to suffer from vomiting of blood and other symptoms of the disease. ("Vierteljahrschrift für die Practische Heilkunde," xxxvi., Jahrgang, 1879. "Analakten," p. 9).

27. An external cause, such as a fall or a blow on the abdomen, has caused rupture of the stomach, when replete with food (Portal.)

28. Long-continued frictions on the stomach produce vomiting, as has often been observed in persons who have used magnetism, through being long rubbed (Portal).

29. Blows between the scapulæ have caused hœmoptysis in delicate persons.

30. Dr. ZIMMERMANN observes: "Consequent upon slight external injuries or chemical irritation of the integuments, the blood is always changed, the amount of its solid particles being diminished." †

* "Cases of Tetanus." By Mr. Simon and Mr. Solly.—*Medical Times and Gazette*, June 17, 1854.

† "On the Changes which the Blood undergoes in consequence of External Injuries."—*Med. Times and Gazette*, p. 3791, Nov. 10, 1849; see also "Kinésithérapie ou Traitement des Maladies par le Mouvement," &c. Par A. Georgii. 1847. Notes, p. 43 and 48.

31. Dr. JAMES HOPE has a case of a man, aged 60, who three months before his death had fallen against a stone striking against the precordial region. A permanent pain and symptoms of heart disease commenced soon after the accident.* The same author relates that violent exertions or a fall have caused rupture of the heart.†

32. Blows over the heart have caused cardiopathics. A gentleman, Mr. W., from Cornwall, consulted the writer in 1862. A constant aching pain in the region of the heart, difficult breathing, and oppression of the chest, palpitations, were the most prominent symptoms. The patient, who was young and strongly built, had consulted several eminent physicians in London, without obtaining relief or any change in his complaint. On further enquiry it was ascertained that some six or eight months previously, attempting to clear a broad ditch, he had failed, and instead had fallen forwards, violently striking the anterior walls of the chest against the edge of the ditch. His obstinate complaint was cured in about three months by some derivative movements, but principally by two passive movements, viz., a kneeling passive quick twisting, with knee-loin pressure, and a concentric percussion, directed to the region of the heart, alternated with a palmar percussion, directed to act on the lungs generally.‡

* Dr. James Hope's "Grundzüge der Pathologischen Anatomie." Aus Englischen von Dr. M. S. Krüger. Berlin, 1836. P. 85.

† Ibid., p. 92.

‡ Among others the lady, who had mentioned the treatment to Mr. W., was suffering from a general paralysis, the result of a fall when a child. There is a circumstance in relation to Mr. W., which might as well be mentioned here. Several years afterwards a regimental surgeon visited the writer, who, when a palmar percussion, applied to the chest, was shown to him, exclaimed, "I have applied that with great advantage to my soldiers, in convalescence from pneumonia." On inquiry where he had learned the movement, he said, "Oh, Mr. W., the banker at C. showed it to me." In this way fragments of the Kinetic treatment may get into use.

33. The writer has met with a great number of patients with various forms of incurable spinal affections, which could be traced to no other cause than a fall or mechanical violent strain or shock to the spine,* sometimes as far back as ten years or more. He has himself a little boy of now eleven years old, who is a cripple from a fall which he had when one and a half years old; he fell from his cot headforemost into an empty pail. Abscesses supervened, and the mischief eventually (after a scarlatina attack) ended in one of the most severe cases of hip-joint disease, from which, however, recovery has been made. At one time there were as many as ten abscesses about the loins, stomach, groin, and thigh, all discharging profusely.

Caries of the elbow and necrosis of shaft of the humerus in a scrofulous girl after a fall, in which the inner condyle and elbow near olecranon was struck. Little inconvenience was observed at the time, but in three days swelling occurred, and in a fortnight matter from an abscess three inches above the joint had formed.† These two cases are representative as showing the result of injuries of the mechanical order that may occur in children of a scrofulous diathesis.

34. Blows or other injuries to the testicles, followed by more or less serious consequences, are of common occurrence.

A case of cystoform disease of the testicle from a blow. The gland was the size of a fist, when removed seven months after the accident.‡

In the same number of the journal mention is made of a watchmaker who died of tetanus, and in whom at the post-mortem examination the rectal muscle was found ruptured and torn quite through. The patient had made no complaint

* "The Lancet," Aug. 11th, 1855.

† "The Medical Times and Gazette," June 5, 1855.

‡ Ibid., Nov. 28, 1868.

about it during his eight days' illness at the hospital, and it was first noticed at the post-mortem examination.

35. Fracture of the pubis in a woman, caused by muscular action from lifting a weight.* This accident among other things proves how far we still are from a just estimate of the power necessary for certain movements in gymnastics.

36. Fracture of the ribs during sneezing occurred in a man 39 years old, who had taken a pinch of snuff. Being unaccustomed to its use, he was seized with repeated sneezing, which he attempted to arrest by closing his mouth and forcibly dilating his chest. He was not able entirely to accomplish this, and a forcible expiration having succeeded to this prolonged and excessive dilatation, he felt at the same time a very severe pain in the left hypochondrium, which was accompanied by a distinct crack; difficulty of breathing and an excessively painful cough supervened. On examination there was found a fracture of the middle of the body of the ninth rib on the left side.†

37. Rubini's broken clavicle is thus mentioned in the *Medical Times and Gazette:* "Sutherland Edwards, in his recently published 'History of the Opera,' tells us something that is not generally known about the celebrated tenor Rubini, of Romano. A passage in Pacini's 'Talismano,' which was entrusted to him, was greatly applauded because of the remarkable power he displayed in producing B flat, without the slightest previous preparation. He performed this vocal feat fourteen times, to the great delight of the musical public of Milan, but on attempting it for the fifteenth time he failed. 'Os habet, et non clamabit.' He was

* "Gazette des Hopit.," No. 150; "Medical Times and Gazette," Jan. 25, 1862.

† Ibid.

dumb. Cheered by his audience, he made a second attempt, and succeeded fully. The audience were delighted; not so the tenor; he felt that in exerting himself to the utmost 'something had given way.' He was wounded, but triumphant. The surgeon of the theatre was sent for, who at once pronounced that his clavicle was fractured—the bone had been unable to resist the tension of the singer's muscles; he swelled his voice until it burst one of its natural barriers. His professional engagements were not interrupted by this accident; he continued to sing with his broken clavicle. Two other vocalists are mentioned, who not only injured themselves in singing, but actually died of their injuries."*

Sprains and fractures belong to the same mechanical category; the former yield most speedily to the resources of the movement-cure, the latter only to rest, bandaging, and position.

38. Dr. K. MALMSTEN (Sweden) has a case of "neuralgia bilateralis nervi-circumflexi humeri" of interest, as proving that it is necessary to observe a certain moderation, even in the case of the healthy, in their education or hygienic exercises, and that over-exertion under any circumstances should be avoided. "A student, who had over-exerted himself during gymnastic exercises, got pains first in the deltoid muscle on the right side, and afterwards similarly on the left; in the commencement only when lifting the arms, but later also when in a state of rest. The pain which was most severe in the mornings, was seated over the external half of the over arm, and in the joint, but extended after some time on the right side of the neck towards the ear. The aching parts felt also colder. Relief was obtained by hanging on the arms, or binding them up; or by holding them over the head whilst lying down. The neuralgia had

* Ibid.

lasted three years, and a number of remedies had been employed in vain.*

39. Affections of the heart are often met with that can be traced to no other cause than violent efforts, overstraining, and other effects of a mechanic character, producing undue blood pressure on the heart. "A case of disease of the aortic valves with regurgitation caused by violent exertion," and a case of marked aortic regurgitation, brought on by violent work, both observed by Dr. HARDWICK, who remarks: "The grand cause is violent exertion, requiring the breath to be held, especially muscular exertion of the arms." †

LAENNEC relates cases of rupture of the heart from violent exertions or external violence (see also observations of Bertin, Portal, Corvisart). ‡

40. Dr. RUTHERFURD RUSSELL has observed that hypertrophy of the heart is an ordinary consequence of rowing matches at Cambridge. §

For those who take an interest in the question of the effects of rowing on the health in general, the following remarks may be added. In countries where a national gymnastic system has been introduced in the schools, the probabilities are, that the results of considerable exertion will not be so injurious as those above mentioned, but like all other emulative exercises, such as walking, running, &c., rowing requires a cautious progressive training, according to individual temperament. Rowing matches have hitherto not been in vogue in Sweden, though rowing has been practised

* "The Northern Medical Archive," vol. v., No. 8. "The Upsala Society of Physicians," p. 145.

† "Medical Times and Gazette," May 9, 1863.

‡ "Krankheiten der Lungen und des Herzens," &c. Übersetzt von Fried. L. Meissner. P. 437.

§ "British Journal of Homœopathy," 1854, p. 537.

from time immemorial all over the country on its numerous lakes and rivers.

41. Dr. HOPE observes: "Violent exercises may even occasion rupture and inflammation of the valves and aorta, ending in incurable organic disease."

42. It has been observed that in heart disease sudden death has occurred as the effect of bending the body forwards, in putting off or on a stocking, the shoes, &c. This may be accounted for by an increased blood pressure to the heart, or the preventing the return of blood to the heart.

43. Dr. T. E. RAWSON, in a letter to *The Medical Times and Gazette*,* has some interesting remarks on the frequency of disease of the heart in poachers; observing that it might be expected to occur quite as much as in Oxford and Cambridge men forming the crews of racing boats, amongst whom Dr. Hope states he has met with numerous instances of hypertrophy. Three interesting cases are given in detail.

44. A writer in the *Lancet* points out the danger of running to catch a train, though the exertion may not be of long duration. "We have," he says, "in our memory cases of grave diseases set up in this way, without the cognisance of the sufferer. There is, however, a class of cases, which does not appear to be generally recognised, to which it may be well to direct attention. Not only may injury be done to the heart and great vessels by this exceptional straining, but the delicate structure of the nervous centres may be injured. It is a common experience with persons who are labouring under certain forms of incipient or subacute nervous disease, that violent exertion causes mental excitement, in some instances producing almost homicidal impulses."†

* "Med. Times and Gazette," Oct. 19, 1850.

† "The Lancet," August, 1880.

It has been observed that gymnastics, as a profession, has a tendency to produce a certain form of excitability of temper, which leads to hypochondriacal affections, irritability, and intermittency of the beat of the heart, &c., the latter especially in those who have been over-exerting themselves as operators in medical gymnastics. As to *this* effect on the heart, both Branting and the writer have in their own persons experienced the truth of the observation.

45. Long-continued compressions of the veins of the neck through tight collars, produce sometimes bad effects. Monro mentions in his "*Traité sur l'hydropisie*," that soldiers who have been forced to wear too tight regimental stocks, have died of apoplexy, after having been subjected to "*bouffissures*" of the face (Portal, op. cit.).

Amongst Russian soldiers, when high and tight-fitting leather cravats were in use in the army, it has been observed that a great number of them, previously in perfect health, have become the subjects of ophthalmic affections in various forms, especially conjunctivitis. This is of interest in connection with the momentary jugular vein pressure (see p. 67), which has proved beneficial in a great number of cases of the above complaints.

As early as 1847 the writer in his "Kinésithérapie," called attention to the observation of Professor Branting on the injurious effects of the use of tight garters. Several medical men have lately concurred in this opinion about the garters. Branting was equally particular about tight collars and wrist bands, which were then in use. He was strict also in the maintenance of some other cognate *dietetic* rules, but there is no space here to ventilate them; and besides, they were considered at the time in the light of exaggerations, as for instance, his objection to keeping the hands in the pockets, especially in patients with cold hands, &c.

46. The most common effects of bodily exercise in healthy persons are a general glow and perspiration throughout the body to a certain degree, in direct proportion to the exertion made. The jockey, for example, has often been reduced by sweating to the amount of several pounds in a week.

47. But violent bodily exertions will also produce a diminution of the temperature of the body (Davy, Dufour, Fick, 1865; compare also experiments of Heidenhain).

The writer has observed in delicate ladies that the temperature often begins to lower, and the hands and feet become colder, after a certain amount of exertion, and the body does not regain its usual standard of temperature until some rest has been enjoyed.

It has been observed that during exertions on the part of those administering medical gymnastics, although at first full perspiration is obtained, yet gradually they become chilly, and this chilliness often lasts the whole day afterwards.

This sensation of chilliness, which often shows itself as an effect of long-continued bodily exertions, proves the importance of individualising the *quantity* in gymnastic exercises, and also the necessity of taking into account the action and re-action resulting from mechanical agencies, which varies, *ad infinitum*, in different persons. The writer, before he commenced the daily use of cold ablutions, though in the prime of life, had become so sensitive to the usual temperature in the house, that he was often obliged to put on a great coat indoors.

48. Repeated rhythmical stretchings of the arms upwards (Swedish Regl. for Gymnastics, mom. 96—123) produce expectoration in young people (A. Santeson). Moderate running tends to produce the same effect. Only holding the arms straight above the head has been observed to cause sudden paleness of the face and a sensation of fainting.

49. Benjamin Franklin has observed that swimming has caused constipation. Travelling by rail or by steamer will in some persons produce constipation. (The writer.)

The revival of gymnastics has in some countries acted as an impulse to the re-introduction of swimming, more as a healthy habit among the young people in towns and as a regular recreation, than as the object of rivalry and distinction. No teacher of gymnastics in Sweden could, till after the year 1862, obtain a commission at a public school without a certificate of proficiency in the art of swimming, and the ability to instruct in the same, with such simplifications as gymnastics alone are able to furnish.* Notwithstanding this law-established rule, a number of abuses have been observed to follow bathing in the open sea, where swimming is universally practised among the youths in the towns of Scandinavia. The greater part of these abuses arise from excess, *i.e.*, over-exertion, or the too long exposure to the low temperature of air and water. There are many cases which show that persons of both sexes (boys and girls), after having obtained a certificate of mastership in swimming, have been obliged to apply to medical gymnastics, or ordinary medicine, for relief in affections of the heart or lungs.†

But even the method of instruction itself, i.e., *the forms of the movements in the water* are in many places wrong and defective. Nothing can so much shorten the time of apprenticeship in swimming as the progressive application of the simplified means which gymnastics afford.

According to Colonel d'Argy, General Willisen, &c., out of 100 recruits, 92 have learnt to swim in less than two

* Compare "Tables in Swimming" (of 1869), which are used for the pupils at the Central Institution.

† These abnormal results have at last in Stockholm led to researches, of which Drs. A. Anderson, E. Heyman, and M. Sondén have given an account; as well as to the giving of advice as to duration of time, temperature, &c., for the conduct of the future.

weeks (compare Clias, 1825).* Such a result can be obtained even by methods that are defective as to hygienic completeness. But it is frequently the case that the small manuals on swimming overlook the importance of the position of certain parts of the body during the first practice. This wrong method lays the foundation in many persons of a bad habit and a bad style of swimming. It is a general fault that the position and movements of the arms and chest are executed without observing the general rule for the gymnastic development in healthy persons, viz., that the greatest attention should be paid to the development of the chest (see "Free Exercises for the Army," of 1836, mom. 459). It is from similar reasons that this method pays so much attention to the form and correctness of the movements, and especially of the preparatory ones in swimming.† A person can swim, fence, or ride on horseback in many different ways. Oronzio di Bernardi, Franklin, and Gutsmuths confirm the observation that the swimming process in a man consists of the same movements as those of the frog. But this resemblance would only be *partial*, even if the frog made use of its fore-legs, had differently organised lungs, and could only *rest* in the water on its back like man. The comparison reminds one of the words of Brehm, "that the most ugly apes most resemble man." We should be guarded against attaching too much importance to such comparisons.

50. HERRMAN and PARKES have observed that extreme

* Mr. Macgregor seems to wish still further to shorten the time for learning to swim. He mentions that "out of 30 girls, 25 were taught to swim in six lessons, and six of them won prizes."—*Land and Water*, 1880.

† Compare the fig. in Auerbach, Laisné, Vergnes, Gustavi. In the collection of drawings (see note, p. 79), the seventh part contains a survey of these conditions, such as they are to be found in different methods of swimming, "Klemställning" (or position in which the chest is compressed by a false attitude), and other such incorrect positions.

exertion tends to an increase of urea in the urine, not so evident in moderate exercise.

51. Violent shaking vibratory movements produce cramp (Poggendorff). It has not unfrequently been observed that patients with diseased lungs have complained of pain in the chest when the so-called chest-lift vibration has been roughly applied, either by an unskilled assistant or by a badly adjusted vibratory machine. The movement, when well and correctly made, generally produces a sensation of ease and comfort to the patient.

52. It has been often observed that "pertes séminales" follow violent bodily exertions, climbing slowly on masts, especially the sudden sliding down on the same, riding on horseback, &c.

53. To the many causes which are usually enumerated as producing deviations of the spine, the following may be added. RIOLAN has observed in his time that French ladies had almost all of them the right shoulder higher than the left, "no doubt," he says, "because they used corsets which caused this deformity."

54. "The spinal deviations, or '*les bosses*,' are often produced," says PORTAL, "by the same means which are recommended to prevent, or even to cure them; for the corset interferes with the natural movements of the body, compresses its muscles, and in preventing their action interferes with their nutrition; from all which it results that the muscles lose their volume, their colour, and are finally, so to say, destroyed."

55. A wrong position, long sustained, and often repeated, will cause deformities of different parts of the body. The Scotchman, for instance, who carries his bag only on one of his shoulders, always ends by having one of the shoulders

higher than the other. The milkwoman, who carries the milk-pails by the yoke, becomes stooping in the neck and round shouldered; quite the contrary with those who carry weights on the top of the head; we find a free and harmonious posture as a consequence of the balancing and straining efforts of all the erectores spinae, as a condition for the possibility of balancing the weight. True as this is in general, it is, however, not a matter of indifference how it is executed, and by whom it is used. It will not do to place a heavy weight on the head of a delicate girl. It is the balancing exercise of a light weight which is useful if the position be correct. Laughable transgressions of this rule can be seen in several books on gymnastics. The weak, growing girl, who rides on a side-saddle always on the same side, often gets lateral curvature of the spine. The habit of writing in a too one-sided position is also one of the causes of spinal deviation. Much riding on horseback produces "bandy legs," &c.

56. The zealous and indefatigable Dr. M. Roth (see prefatory remarks), who has been, and still is making great and laudable efforts to secure the adoption of Ling's system in England, has a paper in the *Journal d'Hygiène* showing, with some good figures, the effects of bad positions, and the way of remedying the same.* The latest efforts of Dr. Roth in attempting to introduce the Ling free exercises into the schools for the blind in Great Britain, though not belonging to this subject, should be mentioned with praise.†

* "Journal d'Hygiène," pp. 154, 155, 157. This paper had been separately published previously. Among physicians who have shown a particular interest in Ling's gymnastic system, the names of Dr. Ceulenaer and Dr. Vtemincx must not be omitted.

† At Manilla, an institution for the deaf and dumb and blind, in the immediate neighbourhood of Stockholm, gymnastic exercises and swimming have been introduced many years since.

57. "The body kept too long," says Portal,* "in this or that position, will ultimately acquire a fault in figure; from such a cause clerks, hatters, paviors, &c., are almost always bent forwards."

58. Turning round and round will soon produce giddiness especially if the eyes are fixed on a point in the ceiling above the head; riding in a carriage with the back to the horses will in many persons produce faintness, oppression, and giddiness; swinging produces in some persons paleness, sickness, &c. Sea sickness is allied to a somewhat similar cause. Let those who are inclined to deny the power of the mechanical agency call to mind the characteristic effects of the pitching and rolling motion of the vessel—pallor, giddiness, nausea, vomiting, faintness, &c.

59. "Vomiting, caused by swinging, riding in a carriage, or the motion of a vessel on the sea," says Dr. A. SIEBERT, "depends on disturbance of the brain." The head symptoms in sea-sickness are the first in order and the most prominent, *e.g.*, giddiness, unsteadiness in motion, physical inertia.† These symptoms become less severe in a horizontal position (see p. 36).

60. Dr. STOKES‡ has made some comments on Dr. GRAVES' important observations in reference to "*the influence of the position of the body on the beat and action of the heart*," of which the following is an abstract: "We may derive," he says, "some assistance in the diagnosis of functional and organic disease of the heart by comparing the beat

* Op. cit., vol. i., p. 300.

† "Diagnostik der Krankeiten des Unterleibes." Von Dr. A. Siebert. Erlangen, 1855, p. 92. Many are the writers and theories on the affection, called sea-sickness.

‡ Op. cit., p. 534.

of the pulse in the horizontal and the erect position." Dr. GRAVES observes that in healthy persons the pulse is more frequent in the erect than in the horizontal position, by from six to fifteen beats in the minute. If the pulse is but 60, the difference is generally not more than six or eight, and this difference increases with the frequency of the pulse, at the time of the experiment. Thus, if it has been raised from 60 to 100 by moderate exercise, it is not unusual to find the difference 20 to 30. The pulse, too, according to Dr. G., is stronger in the horizontal than in the erect position, consequently its maximum of strength and minimum of frequency are attained together. And he applied this fact to the explanation of the relief produced by the horizontal position in syncope." In cases of hypertrophy, the influence of position on the pulse is less observable, and in hypertrophy with dilation Dr. Graves ascertained that no such difference was perceptible. Dr. Graves has arrived at the following conclusions as to the effect of change of position: "In patients labouring under fever, or in a debilitated state, the difference may amount to 30, 40, or even 50, between the horizontal and erect position; this difference decreases in most cases after the first quarter of an hour, but remains considerable as long as the same position is observed, when the patient lies down the pulse rapidly falls to its former standard; the increase of frequency of the pulse is greater between the horizontal and sitting posture than between the sitting and erect, the sitting position may thus be taken as a medium."

Sir Astley Cooper ("Lectures on Surgery") has remarked that in cases of concussion of the brain there is an increase of the rapidity of the pulse when the position of the patient is changed from a horizontal to an upright one.

61. Dr. THOMPSON has also made observations to the effect "that there is a difference of the pulse in the erect and horizontal position in health, and still more in disease."

62. MORGAGNI* mentions several cases in which the position of the body aggravates the suffering of the patient. He mentions as an instance, a case of hydrops pericardii, in which it was impossible for the patient to lie on the left side. This, by the by, is more or less the case in several affections of the heart.

63. Sydenham thinks that in gouty patients calculus in the kidneys may arise from sufferers lying too much on the back.

64. MORGAGNI, in relation to Gibbosity, makes mention of a woman whose spine had become crooked from carrying heavy burdens on her back to earn her livelihood. This celebrated author further alludes to the observation, "du celebre NEBEL," who confirms the view that work of the above kind is one among other external causes which produce gibbosity principally in young people.†

65. MORGAGNI devotes some 120 pages to accidents, such as wounds and blows, &c., on the head, neck, chest, stomach, and the extremities. The great number of cases given are the more instructive, as most of them are accompanied by post-mortem examinations. In this rich collection the interested reader will find a great number of traumatic affections of the head, ending fatally within the fourteenth or eighteenth day. In p. 326 he says: "You will see a case of mortal disease developing itself in the deep region of the stomach, in a man, who falling with his horse, had violently squeezed it against the pummel of the saddle several years before, and which he had neglected."

66. PLATNER has also shown in a learned manner that from

* "Recherches Anatomiques sur le Siège et les causes des Maladies." Par T. B. Morgagni. Paris, 1855.

† Ibid., vol. ii., p. 195.

the above cause there occur often in other organs scirrhus and indurations. HALLER has also made mention of a "similar result in a man, who whilst inebriated, was kicked on his stomach by his comrades."

Mention is made of a man who received a kick from a horse on the umbilical region, and was killed on the spot as by an apoplectic fit, &c.*

67. The writer remembers a case of an old gentleman, Mr. H., who falling on his back, struck the back of his head against the curb-stone. Though between 70 and 80 years of age he had strength to walk from Oxford Street to his home in Highgate. A day or two afterwards paralysis of the right arm and leg supervened. A couple of months afterwards the walking power had returned, but the arm remained rigid and paralysed. He was treated by the writer Kinetico modo, and completely recovered the use of the arm in a couple of months.

68. Dr. BALZER, in his work "On Typhlitis and Perityphlitis in Children,"† observes that mechanical influences may cause an eruption of the disease, or produce an increase of a state of inflammation. Altogether irrespective of and differing from the perforation produced by typhoid or tubercular ulcerations, mechanical influences, as for instance, over-exertion by carrying, lifting heavy burdens, a fall, a blow, &c., may often bring on permanent lesion in the gut. The anatomical relation of the cæcum, its fixed position, and its being so often expanded with contenta and gases along with closing of the iliocæcal valve, causes an especial predisposition to such a result.

* Ibid., vol. iii.

† "Observations et recherches pour servir à l'Histoire des Inflammations du cæcum chez l'enfant par F. Balzer. Vierteljahrschrift für die Practische Heilkunde, xxxvi. Jahrg., 1879. Analecten, p. 8.

69. PORTAL* has mentioned that violent exertions constitute one of the causes of engorgements of the vessels of the brain, producing apoplexy. He adds, "that many anatomists of celebrity considered that the extravasation of blood in the third ventricle was found more often in the right than in the left side of the brain, in consequence of the greater development of the muscles on the right side of the body, which consequently exercised a more violent action on that side." Relata refero. "The horizontal position," he observes, "is injurious to persons suffering from engorgements of the brain; under such circumstances the head should be elevated as much as possible:" and he adds, "that it has been many times observed that bleeding from the nose has ceased and headaches been improved by simply attending to these means."

It is self-evident that traumatic cases, strictly speaking, form a distinct group, not to be confounded with accidents, as fractures, luxations, blows, &c., which occasionally occur in sports, wrestling, &c. Such accidents were some years ago at gymnastic establishments limited to the exercises of healthy persons, for instance, in leaping, vaulting, climbings, wrestling, &c. Under such conditions they may in a measure be excused, though they generally bear witness to the ignorance and too great roughness and daring of the leader.† Unfortunately the experience of recent and later years bears witness to the fact that even under passive movements, mas-

* "Cours d'Anatomie Médicale," &c. Par Antoine Portal. Paris, 1803. Vol. ii., p. 87.

† Observations have been recorded in all countries of accidents occurring during gymnastic exercises. In order to obtain a sufficient number of facts for future statistics as to the danger associated with different exercises, the sensitiveness to certain forms of exercises, manifested by different individuals, the physical development obtained, etc., it has been proposed that a diary should be kept by the teachers of gymnastics at all the public schools, and an annual report sent in to the Gymnast. Centr. Institution. (Dr. Hartelii, Periodical for Gymnastics, 1879.)

sage, &c., such undue violence has been employed as to occasion accidents. Cases have been related of such severe treatment as to produce fainting, nay, even cause fractures of bones. Another kind of bad effects from a faulty application arises in the so-called home movements (systematical exercises made at home by the patient, but with no supervision).* The results of such attempts are generally seen in defects in the position of the body, which almost always increase, and at times produce a confirmed disfigurement. Such bad results depend partly on the kind of movements selected, and partly on a defective execution of them. Branting formerly exhibited a kind of hesitancy in giving such prescriptions. There is in the papers at the present moment a passing approval expressed as to the correctness of the Swedish movements. It has been remarked "*quant à la correctété elle leur est propre.*"† But no method, even the most simplified and correct can, in every case, and for all persons, suffice to guard against the neglect or awkwardness of individuals.

* In the collection of prescriptions, already mentioned, the oldest prescription for home treatment of Professor Branting is of date 1835.

† Buschmann, "Revue Gymnastique Hebdomadaire," 1880. Also Ducret's periodical.

CONCLUDING REMARKS.

"De tous les phénomènes qui caractérisent la vie, les mouvements sont les plus importants; on peut même dire qu'en général, c'est par des mouvements que se caractérisent toutes les fonctions."—MAREY.

RESEARCHES, more direct in their character, and more express in their aim, into the medical literature of the past and the present, would doubtless have resulted in a yet more imposing array of cumulative testimony in support of our plea, but enough has been advanced to justify the claim put forward on behalf of the medicina mechanica, that it should be admitted as an integral part of the art of healing.

To avoid prolixity in a work like the present, the writer has been obliged to leave unnoticed several well-known works treating on gymnastics, not only *en passant*, but works devoted solely and principally to the subject. Many authors have written treatises on gymnastics, with the same object as the distinguished *Vieth*, *Gutsmuths*, *Jahn*, *Clias*, *Amoros*, *Eiselen*, &c., but all these writings are devoted especially to that branch which has been called pedagogic or hygienic gymnastics, because it mainly concerns persons in health, and especially young persons and school children. During his private practice the writer has of late years had less time and opportunity to devote to this branch of gymnastics than he could have wished.* He has already expressed the opinion

* It is right, however, to mention the attempt of the writer to introduce Ling's system in its entirety into England. For that purpose he built at considerable expense a gymnasium at No. 18, Wimpole-street, which at the time was one of the largest and most complete in London (from 1858 to 1869). The difficulties in relation to the introduction and organisation of a rational gymnastic system on a broad and national basis,

everywhere current among the first followers of the Swedish method, that *only as gymnastics are understood and practised as a whole*, can they become developed to a distinct scien-

have been alluded to in these jottings. What smaller countries have attempted, Great Britain with its enormous resources will easily attain, when once the nation has become alive to the importance of the subject. In a lecture delivered before the National Health Society in 1873 ("Rational Gymnastics in their relation to the Health and Education of both Sexes," London, 1873), the writer has attempted to set forth the manner in which this might be effected. In the rivalry of nations, health, strength, developed facilities in various handicrafts, &c. (all gifts of a thorough gymnastic training) will be on the side of the successful competitor. The subject is too complicated to be more than touched upon in a note. This may, however, be added. Among the countries which have made any attempts to become at all acquainted with the Swedish method, Prussia is the only one which has taken a step in the right direction. In order to facilitate the organisation and introduction of gymnastics into its army, and its schools, it was found necessary to adopt the simplifying principles of the Swedish method, and two gentlemen were sent for the purpose of going through a complete course of study, theoretical and practical, at the Central Institution at Stockholm. As a result of this proceeding the Central-Turnanstalt in Berlin, with its present subdivisions, was founded. See H. Rothstein's "Die Königliche Central-Turnanstalt, 1862," and Stocken's "Beiheft Zum Militair-Wochenblatt, 1869," published by Borbstædt, Berlin.

Lately, in the summer of this year, some forty Swedish gymnasts have visited England with the view of exhibiting their prowess in Swedish gymnastics. Their skilful performance and their elegant costumes were commented on with praise in several of the daily papers. Though the writer disapproves of such dressed-up public exhibitions, considering them only calculated to pander to a morbid taste for external show, both on the part of the exhibitors and the public (an entire modern outgrowth on Ling's system, and in contradiction to its wonted simplicity), he nevertheless hopes that this demonstration on the part of our gymnastic enthusiasts will have aided in calling attention to the subject. Any permanent and positive results cannot, of course, be expected from such exhibitions. Those who take pleasure in emulative excursions to foreign parts, may be benefited by reflecting on the advice of HOMER of old, who says: "The man is a fool who, when a stranger in a strange land, contends in athletics with his host."

tific art, founded not only on isolated empirical facts, but on several branches of the natural sciences. The difficulties that hinder modern gymnastics from obtaining such an integral development and general adoption are sufficiently plain. The means proposed to effect this purpose in Sweden are: Firstly. General obligatory gymnastics for all youths in the schools throughout the country. Secondly. Their introduction as a complement to the medical curriculum, containing an additional course on the theory and practice of hygienic and medical gymnastics, &c. The subject is in this way in Sweden gradually approaching its goal. Progress might perhaps, however, be facilitated, if the medical student were to go through his gymnastic course at the commencement of, or simultaneously with his medical course of studies.

The writer has also passed over a considerable number of writings on gymnastic subjects, on account of their exclusively polemical character, which naturally does not fall within the range of these jottings. Such are, for instance, the publications of *H. Meyer*, *Dubois-Reymond*, *E. Friedrich*, *Schreber*, *Schildbach*, &c.* Each of these authors respectively has violently attacked the Swedish method in its very principles, whilst others, equally polemical, have exhibited some

* It would be easy to add some fifty or more names of authors more or less polemical who reject the general principles of the said method, or deny the truth of its experience and observations. The antagonistic proceedings of all these German friends might find their explanation in the following lines of the distinguished physician, Sir James Simpson: "From time to time in the march of medicine and other allied sciences, some earnest and expanded mind conceives and elaborates a great and novel thought, destined in its practical application to ameliorate and promote the happiness of mankind. But hitherto, almost as often as the human intellect has been permitted to obtain a new light, or strike out a new discovery, human prejudices and passions have instantly sprung up to deny its truth or doubt its utility; and thus its first advances are never welcomed, as the approach of a friend to humanity and science, but contested and battled with as if it were the attack of an enemy."

marks of impartiality, viz., *Richter, Massman, Bock, Behrend,* Kawerau, Görne, Scherff*, &c.

In case it might be expected that some authors on what has been called electro-gymnastics should also be mentioned here (Knorr, Meyer, &c.), the following observations may briefly illustrate the point. The use of electricity and also of water (hydropathy) is in many ways connected with the movement cure. Some forms of electro-therapeutics seem, as it were, to have a place *between* active and passive movements.† The writer has taken an interest in the application of electricity; and after having had the advantage of following the *clinique* of the distinguished Dr. DUCHENNE DE BOULOGNE, he adopted Faradaysation for some years as an adjunct to his kinetic practice. In 1858, however, he began in preference to make use of static electricity, as taught and applied by the distinguished electrophile at Lyons, Mons. BECKENSTEINER.‡ The writer's connection with this treatment has been kindly alluded to by Dr. T. CLEMENS, of Frankfort a. M., who though he fully acknowledges the curative effect of different metals (metallo-thérapie, by Dr. Burcq), still expresses doubts as to their effects in connection with electricity à la Beckensteiner.§ The publication of results obtained by this treatment alone, or in combination with electricity, must be passed over. Kneadings, percussions, frictions, &c., applied to the patient, whilst charged with electricity, promise to be of great use, and forms as it were, a bridge between the pure kinetic and electric treatment.

* See Dr. Cornette, "Manuel de Gymnastique," 1873.

† Dr. Le Blond, among others, has in his "Manuel de Gymnastique Médicale," devoted some pages to the subject of Faradaisation and continuous currents.

‡ "Études sur l'Électricité. Nouvelle Méthode pour son emploi Médicale. Par C. Beckensteiner. Paris, 1859.

§ Th. Clemens, "Heilwirkungen der Electricität." Op. cit.

Several persons, of more or less learning and renown, have since the distinguished Dr. C. U. Sondén, and the learned pessimist, Dr. Reimer (see p. 60), expressed different opinions as to the future destiny of the labours and endeavours of Ling and his followers. It will have been seen from what has before been stated, that physicians in various countries at one time embraced the Kinesiatric practice, both theoretically and practically; though it must be confessed that any great result could not be expected, when almost all of them had neglected to obtain a satisfactory knowledge as to the practical application and administration of the movements or kinetic operations. As a consequence, only a few remain at present as co-workers in the field. The most unexpected, and at the same time, encouraging sign of the times is, that the eminent professor of physiology at the University of Upsala, Dr. F. Holmgren, has given the gymnastic cause the support of his name in an interesting pamphlet on the subject.* Even in the course of the present year 1880, has Dr. Pagliani of Turin expressed the most decided opinion on the favourable influence of the Swedish method as exercising a steadily reforming influence on the modern gymnastics. Among other enunciations as regards this sub-

* "A few words on the Object and Importance of Corporal Exercises." A speech at the annual meeting of the Society of Physicians at Upsala, the 17th September, 1873, by Frithiof Holmgren. The sanguine friend of gymnastics, Dr. Liedbeck, who kindly sent a copy of this pamphlet to the writer, then still living in England, had written on its first page, in proof of his warm interest in the subject, and as a mark of appreciation of the talented author, the following sentence: "Karl Augustus Georgii will, no doubt, with the same feeling as myself, read this clever speech of Professor Holmgren, who with his experimental physiology is certainly "primus inter pares" in the Medical Faculty at the University of Upsala. Through our friendly intercourse with Ling (certainly greater in mind and heart than any one man we have ever met), and as co-editors of his posthumous work, we are both familiar with Professor Holmgren's ideas, though they are expressed in more modern and eloquent forms of thought."

ject, he makes use of the following expression: "Si capisce che il methodo ginnastico Svedese è il frutto di un lungo studio ed ha basi solide nell' anatomia e fisiologia." . . . "Jo non mi meravigliavi quinde punto che il capitano Rothstein, mandato nel 1845 a studiare il metodo del Ling a Stockholm dalla Prussia, vi sia tornato di esso entusiastica e si sia dedicato a modellarvi sopra la ginnastica militare tedesca, che ha pur dimostrato essere buona educatrice di soldati."*

But the real danger as to the future prospects, continuity, and scientific development of the Swedish gymnastics, is in reality great; and consists in the general lack of knowledge, theoretical and practical, on the part of the gymnasts themselves. Ling, in his lifetime, exercised a strong control over the correct execution of the several movements in the different branches of his system, and he was especially particular as regards the few who practised his medico-gymnastic treatment, to prevent its being mixed up with irregularity and charlatanism. The experience at the present moment both in Sweden and elsewhere fully proves that this rigid supervision was not superfluous. For it seems not unlikely that every country will soon be overrun with kinetic practitioners à la Ling, both medical men and irregulars, who in reality, or in a true practical sense, know very little about the subject, and as far as the latter class goes, perhaps still less about disease.†

* "Ginnastica Educativa," 1880, No. 21. Edited by G. Borgna.

† It is a noteworthy fact that since 1864, when the Gymnastic Central Institution at Stockholm came under the direct supervision and control of the Board of Health the number of half-educated gymnastic practitioners, ladies and gentlemen, have increased in an alarming proportion. To gymnasts who have to do with the treatment of disease may fittingly be applied the often quoted line of Pope

"A little learning is a dangerous thing,"

and further that

"Fools rush in where angels fear to tread."

Just on account of the physiological basis of the Swedish method, it

The learned orthopædic physician, Dr. Volkmann, says in Bilroth's work on "Surgery," that the physiologist, Dubois-Reymond, has discovered and proved "die völlige Unhaltbarkeit der Principien auf welchen die Lingsche Schule ihr system aufgebaut hat." The opinion of the anatomist Dr. H. Meyer, and the physiologist, Dr. Dubois-Reymond, as well as that of some other already forgotten scientific worthies, that the Swedish gymnastics, "bald in vergessenheit gerathen werde," seems to have been adopted as satisfactory by Dr. Volkmann. He adds, however, that "Ling as to his character was an honest man, though he was blinded by the idealistic aim of his attempts." The writer is not going to contradict these scientific authorities; he is only afraid that there is another cause, leading to the predicted result, which has already been alluded to by Ling in the preface to his "General Principles of Gymnastics." The continually, year by year, increasing number of patients who, in all towns throughout Sweden, are in quest of the medico-gymnastic treatment, cannot be reasoned away, but simply renders a prognosis still more complicated.*

In the meantime it is no easy matter to decide how or by what means the whole gymnastic question may be brought to

takes less notice of the *kind* of gymnastic apparata, a fact already pointed out in Ling's "General Principles," where the apparata are looked upon only as external means of appliances (vehicula), but not as deciding the real desiderata of gymnastics. It is, therefore, a mistake committed by some friends of this method, to condemn (on account of their notorious abuse) some apparata which are considered indispensable in other systems.* The Ling method tends only to diminish dependence on the "*materiel*," to simplify its character, and to reduce it to a small number of varieties. (See above.)

* In Stockholm alone there are at present eight establishments, greater or smaller, all crowded with patients, besides four medical men who practise "massage" as a speciality, and many gymnasts who visit patients at their respective homes for the application of the medico-gymnastic treatment.

a legitimate and satisfactory issue, unless by the introduction of a stringent control on the part of medical authorities—of course taking for granted that these same authorities *have practically mastered the subject*—and by the organization of schools wherever its introduction is attempted, for the theoretical and practical teaching of gymnastics in its several branches, and for its development in a scientific form.

These fragmentary jottings will be fittingly concluded by a few extracts from an address by Dr. Clason, Professor of Anatomy at the University of Upsala, at the anniversary meeting of the Society of Physicians at that place in 1876.*

After some general observations on the present state of the natural sciences, and their relation to practical medicine, Prof. Clason introduces his subject by expressing regret at the tardy recognition, and the want of encouragement that gymnastics has received on the part of the medical profession, and says: "What increased power to prevent and to cure disease, would not on the one hand the knowledge of its method of treatment afford the physician, and on the other, what would not also gymnastics obtain in the way of advantage from its union with medicine." Alluding to the fact that Ling was rightly called "the father of the Swedish gymnastics," and that the Swedish medical gymnastics was "the only one of its kind," he gives Ling's subdivision of his therapeutic movements into active, passive, and half active, or so-called duplicated or resisting movement, observing: "By all these movements, except the passive, viz., frictions, kneadings, percussions, &c. (the lately introduced massage belonged, it will be seen, already to Ling's methods of treatment), the whole voluntary muscular system is directly acted upon. . . . . Gymnastics will thus powerfully contribute to the development, strengthening, and preservation in health of the muscular system. Of what advantage the possession of

* "On the Medical Importance of Gymnastics." A Discourse at the Anniversary Meeting at Upsala. By Dr. Edw. Clason. Upsala, 1879.

powerful and harmoniously developed muscles is to our physical life we are all fully aware. Its reaction on our mental energy, the elasticity of mind, the calmness and confidence it produces, ought not to be unknown to us, at least as to its general phenomena. By how much we value these advantages, by so much ought we to value gymnastics, which can secure them to us; and when we further remember that almost every vitæ genus gives a tendency to a one-sided development of the muscles; that every profession, as it were, has its own characteristic features of danger in this respect; and that these evils can be counteracted and remedied by gymnastics; its importance, even in this point of view, becomes increased. The muscles, as the most busy workers in the human body, resemble, in a measure, the working men in the social system, inasmuch as they are less susceptible, more proof against disease than the other organs. Medical gymnastics is also not so often specially applicable to them. Paretic and paralytic affections, as well as muscular contractions, find, however, in medical gymnastics, a more powerful curative agent than in any other treatment. I have myself seen a youth of 17 (whose muscles had been contracted ever since his earliest childhood, and which were completely insensible to the galvanic current) quickened to a new life by the gymnastic treatment. I know also personally a gentleman, aged 50, whose muscles during twenty years had become more and more atrophied, notwithstanding that all the resources of medicine had been brought to bear upon them, and yet those muscles, by the same mode of treatment, were again rendered capable of discharging their functions. Attention should also be drawn to the fact that through the muscles we can act on the skeleton and the cavities of the body, which, as to capacity, undergo complete modification through the muscular activity." "By the gymnastic treatment a crooked spine can, not infrequently be made straight; a narrow and depressed chest widened, or an abnormally projecting chest rendered pro-

portionate, the relaxed abdominal walls can be strengthened, and disposition to rupture thus prevented." We are further reminded that "as the muscles make up the greatest bulk of the body, the quantity of blood which circulates in their capillaries during repose is proportionately great (one-third of the blood quantity of the body), the waste and repair in them also relatively great," &c. "The gymnast is therefore able, through his power over the muscular system, to diminish a too strong, or increase a too weak nutritive action of the muscles; or, in other words, without losing a single drop of blood, he is able to stop, or at least to diminish a venous congestion, and even successfully to battle with an arterial one." The intimate connection and interdependence of the nervous centres and the muscles is then referred to, and the influence of medico-gymnastics in this respect insisted upon. "The volitional impulses, having their starting-point in the nervous centres, and conducted along by the motor nerves, these become subjected to the influence of regulated movements, and obtain consequently increased functional power." Further on it is said, "The obedience of the muscles to the influence of the will becomes more perfect and energetic in proportion as by repetition, the volitional efforts are directed to pass through the defective nerves. The individual gains not only a complete mastership over his body, the influence is extended to the whole being," &c.

"It is from the digestive and other mucous membranes and glands that the blood supply to the working muscles is obtained. Gymnastics can also, in the sense already alluded to, regulate the blood quantity and function of these organs. The increased waste and repair in the working muscles afford means of re-acting on the digestive apparatus." After some further physiological deductions the Professor continues: "It has been said that gymnastics is the only true stomachic we possess. This expression becomes more correct, nay, almost literally true, if we take into consideration the muscular coat

of the stomach and intestines. An increased activity in the voluntary muscles produces, for example, a similar activity, and consequently greater development in the involuntary muscles."

On physiological principles, and by a strict process of reasoning, too long for this abridged extract, the Professor proves to demonstration the power of the Kinetic treatment in affections of the heart.* Alluding to the action of the gymnastic movements on respiration and its organs, Dr. Clason touches upon their connection with the functions of the medulla oblongata, observing finally: "It is evident that this effect of the muscular work does not stop with the lungs and the heart alone. Its influence is extended to the whole circulation, and, in combination with an increased assimilation of nutritive elements, produces increased nutrition of the whole organism." As a proof of the effect of muscular action on the osseous system, the known fact of the bones becoming harder, firmer, and more elastic in that part of the body, the muscles of which have been most in use, is brought forward. The Professor adding that, "if the marrow, as has lately been supposed, is one of the principal sources for the formation of the blood corpuscles, the importance of possessing an osseous system perfect, not only as to form, but also as it regards internal qualities, becomes evident. The effect of muscular exercises on the skin is also examined, and the conclusion arrived at, that the cutaneous functions can thereby be revivified, regulated, and controlled.†

"It has been shown how gymnastics by the active and duplicated muscular movements, is able to exert an influence

* See pp. 146, 170, 171.

† These effects merit attention, as they concern one of those organs which by many critics have been asserted to be outside the range of the influence of medical gymnastics; a doubt which seems incredible in the face of the indisputable fact of the volumes of perspiration which abound in and infect the air of every gymnasium. (Compare Dr. Vallin.)

over the whole organism. This influence is rendered still more complete by the so-called passive movements, rotations, percussions, kneadings, frictions, and by whatever other names they may be called, which it also employs. Through these manipulations it acts, in the first instance, on the sensitive nerves, and makes use of the reflex apparatus. It acts powerfully, as a more or less modified "massage" on the cellular tissue with its lymphatic and blood vessels, and thus produces among other things resorption and dissolution of morbid products. Through the rotatory movements it is able to produce the same effects, by bringing into play what by Braune is described as the venous pumps. Through kneadings, pressures, &c., a temporary increase in the circulation may be effected, and the tissue-change may be increased in organs with declining functional power, and thus a new life may be gradually imparted to them. By directly laying hold of internal organs which can be reached, it is possible, when necessary, to restore, *pro tempore*, their lost normal position and gradually to render this position permanent."

"The survey," the Professor continues, "which I have given on the subject, is certainly incomplete, but enough has been said, as it appears to me, to produce the conviction that gymnastics are of great therapeutic value; that they are equally capable of preserving and fortifying the health, and of conquering and curing diseases;" adding that, "though hitherto it is principally in chronic diseases that they have been used, there is the probability that even in acute diseases they may be successfully employed." "I have been told," he says, "that this has been increasingly the case during the last few years."* The advantages that the study and adoption of gymnastics would afford the physician are then referred to and explained. And further on he says, "but would not the science of gymnastics also obtain advantage by being united with medicine?"

* See p. 191 and p. 203, note.

"Gymnastics ought in the first place to obtain by such union a higher development. The medical sciences alone would not make a skilful gymnast; practical skill would be necessary for such a purpose. But with this alone he would be placed in the same position as regards his art as the physician is to one part of medical therapeutics; he would have to rely on the experience of others. In our theoretical curriculum the gymnast can only spare in relation to medicine, pharmacology and chemistry; in practical matters he must study the diagnosis of disease. But opportunities for gaining this knowledge can only be obtained in a medical school." . . . . "Gymnastics, as to its idea, is in reality a branch of medicine, even though it has up to the present hour grown as it were as a shoot in its own soil; but grafted again upon the mother stem it would develop to its full growth and richness." . . . . "In the armoury of the physician it would be a new weapon, which would make him not only more able, but more confident and assured in the contest which he has to carry on for the benefit of his fellow creatures and society at large."

Professor C. then proceeds in some pages to remark upon the important position of gymnastics as a prophylactic, and its great influence for educational purposes to the growing generation, recommending as much as *two hours daily* to be devoted to the physical training of the body as a counterbalance to the overtaxation of the brain,* so often complained of in the methods of our schools.

Professor Clason's important address would have deserved a full translation; as it is, it has lost not a little of its

* This proposal as to the enlarged amount of time for physical culture in the schools is a support as unexpected as it is important to the views and wishes which have been expressed by several teachers of gymnastics; and is exactly in harmony with what has been proposed also in the Swedish gymnastic literature. (See Professor Hartelii's periodical for Gymnastics, 1875, p. 126—137.)

original terseness, in consequence of its defective rendering on the part of the writer, and also of the many necessary abbreviations which have marred its logical and physiological completeness. The address is concluded by the following quotation from Ling, "I pray to God that physicians and teachers may, one and all, in the future enlarge and improve upon my attempts; then, doubtless, will gymnastics recover, at least in the North, the same great influence and importance which it once possessed in the minds of Plato, Hippocrates, and Galen." Professor Clason further adds: "Thus ends Ling the preface to his posthumous work. This prayer offered up during an illness, from which Ling never recovered, carries with it the solemn character of a last will and testament to future physicians. Can and will the present generation of medical men put it into execution? and could this be more effectually done than by the union of his system of gymnastics with medicine? And what should further induce us to take such a step but the conviction that medical science would by such means make another important stride towards its perfection; this, in conjunction with that love of our profession which stops at no sacrifice when such a goal is to be attained."

May these noble, liberal, and hopeful words, uttered by an eminent academical teacher to the young physicians in Sweden, be echoed far and wide! may they one day be universally realised! and may our Heavenly Father grant them His effectual blessing!

APPENDIX.

In appending a few letters addressed to the Governments of France and England—for the purpose of inducing them to give encouragement and support to Rational Gymnastics as an important branch of Physical Education—a statement or two, elucidatory of the circumstances under which they were written, may not be without a present interest, nor destitute of value in a historical point of view, for those who are concerned about the future solution of this important question.

In about 1840 a French *savant*, Mons. Gaimard, having spent some months in Sweden, gave it as his opinion that it was worth while to visit Sweden if only on account of its system of Gymnastics. In consequence of this authoritative utterance, the French Government shortly afterwards sent a *request* that they might be furnished with a Report on the principles of Ling's Gymnastics, and on the organisation of the Gymn. Centr. Institution of Stockholm. The succinct statement drawn up by Professor Branting on the occasion, from some cause or other, probably from an imperfect translation, failed in its intended purpose; and on my arrival in Paris in 1846, I soon ascertained that the subject had entirely fallen into oblivion with the Authorities. Encouraged, however, by the then Swedish Ambassador at the Court of France, Count G. Löwenhjelm, I published the *aperçu* on Ling's System already alluded to in the Prefatory Remarks, hoping to revive the interest of the French Government in relation to this question. In consequence of a letter to the then Minister for Public Instruction, Count Salvandy (lit. A), I obtained an interview, in which I was promised that a Committee should be appointed to enquire into the claims of our Gymnastics. The Revolution in February, 1848, however, put a stop to this plan entirely.

The Provisional Government of the Republic being well established, the following mem. (lit. B, C, D), among others, were sent to the President of the Republic, the Ministers for War and for Public Instruction, without however being attended with any result.

The address to the English Minister of War (lit. E) was followed by the same unsatisfactory issue.

The Gymnastic question, therefore, still awaits its solution in most parts of the civilised world. Much as has been done in many directions for the amelioration of the physical and sanitary condition of the masses of the people, as well as for the mental and moral culture of the upper classes of society, so long as the *bodily* forces are left neglected, or only developed in a one-sided and unscientific manner, the educational question has received but an unsatisfactory realisation. Gymnastics, as at present practised in most countries of Europe, are entirely empirical, and consequently inefficient and inadequate for the accomplishment of their important mission. They must be placed on a scientific basis. Ling, whose observing genius was not long in detecting the value of a body of facts, such as those which are presented in this volume of details, very soon directed his attention to the importance of the formulation of a Rational System. Having subdivided the various exercises—according to their different purposes, aims, and character—into Medical, Educational, Military, and Æsthetic Gymnastics, he soon found by practice that these branches mutually re-acted on each other; exhibiting more or less the general gymnastic laws of development of form, power, and motion, making up a whole—a unit—Rational Gymnastics. The study of anatomy and physiology, constituted from the beginning, an integral part or the basis of the system.* And this system of rational exercises, based on anatomical principles and physiological laws, is that which we are endeavouring to advocate. The defects which existed forty years ago, still unhappily prevail in our own day. Empiricism usurps the place of rational function. It is true that a vague impression, or a general "Bewustsein," as to the advantages that may be derived from a systematic and scientific bodily training for each and all, has become more markedly manifest in the general gym-

* In the Swedish method it is the development of the medical branch—based as it is on the differential effects of movements, and the materia-medico-gymnastica thence derivable—that has thrown light on the pedagogic and other branches of the Gymnastic system as a whole. The method has from this cause been distinguished by a character for carefulness and selection in form.

nastic literature of the day, in almost every country; but we want this conviction to become more deep and more practical. We want the Governments, the savants, and the philanthropists of our time, to unite their efforts in common accord for the organisation of schools in their respective countries, for the teaching of Rational Gymnastics; that thus teachers may be trained in any or all of its several branches, in connection with a knowledge of anatomy and physiology;* for as yet in this direction, excepting in Prussia and Scandinavia, no attempt has hitherto been made. In this way this important practical science will be at length purified and simplified, and placed on one scientific kinesiological basis; and thus would the different Gymnastic centres be in a condition to mutually and salutarily re-act on each other, whilst naturally diverging in a purely practical point of view, into exercises adapted in each country in accordance with national traditions and national idiosyncrasies.

This is not a question of *nationality*. Science knows no limitation of that kind: its one aim is truth; its goal the happiness of universal man. It is as a member of that great family, anxious in some humble measure to contribute to that noble end, that I venture most respectfully to lay before the several Governments of Europe this honest although confessedly imperfect appeal on behalf of the system of Rational Gymnastics.

* This does not of course include the idea that every drilling-master or teacher of gymnastics in the primary schools should possess anything more than general notions on these points; but it is important that in every country there should be found a requisite number of leaders and inspectors, with full knowledge of those sciences on which the theory and practice of gymnastics depend. This is not simply an idealism. There is yet at the Central Institution of Stockholm, in the person of Professor Hartelius, a standing evidence that a real interest in and love for Gymnastics, is able so far to influence a physician, as to lead him to take a practical part as a teacher in educational gymnastics and fencing, although his own special department is medical gymnastics.

(A.)

Monsieur le Ministre,

Ayant l'intention de propager en France le système de Ling sur l'emploi hygiénique et thérapeutique des mouvements, système appliqué en Suède depuis trente ans, j'ai l'éspoir que V.E. dont les sympathies éclairées ne peuvent rester étrangères à une fondation utile, voudra bien, en accueillant l'ouvrage ci-joint que je viens de publier sur le traitement des maladies par le mouvement et sur l'éducation physique, m'accorder un local convenable, où je pourrais faire connaître la pratique de la méthode de Ling dans ses trois branches principales : la gymnastique hygiénique et pédagogique, la gymnastique médicale et la gymnastique militaire.

Déjà en 1840 Votre Excellence s'était adressé au gouvernement Suèdois pour avoir des renseignements sur l'éducation dans ce pays, et sur l'organisation de l'Institut Central de Gymnastique à Stockholm. En ma qualité de sous-directeur de cet Institut je suis à même de donner sur ce sujet des renseignements exactes et précises. Sous le rapport hygiénique et pédagogique, le système de Ling est tout à fait encore inconnu en France, aussi bien que ses résultats au point de vue médical et militaire.

Si V.E. prenez ma demande en considération, peut être jugerait elle convenable de nommer une commission composée de deux médecins, de deux instituteurs, et de deux militaires pour juger des bases du système qu'ils avaient mission d'examiner. Cette faveur qui se bornerait à mettre un local à ma disposition, mettrait ainsi au grand jour les avantages du système de Ling, d'une manière bien plus frappante et plus complète que toutes les explications soit orales soit écrites.

En attendant la décision de votre Excellence,

J'ai l'honneur d'être votre très humble et

très obéissant serviteur.

(B.)

À Monsieur le ministre de l'instruction publique.

Monsieur le Ministre,

Le projet d'une nouvelle organisation de l'instruction publique en France, conçu par la haute sagesse des membres du

gouvernement provisoire, me fait ésperer que désormais on tiendra aussi compte de l'éducation physique, laquelle doit servir de base et de complément au dévéloppement des facultés intellectuelles et morales de l'homme. C'est pour cette raison que je prends la liberté de m'adresser à vous Monsieur le Ministre, pour vous prier de vouloir bien fixer votre attention sur la méthode de Ling, qui a eu depuis une trentaine d'années en Suède le plus grand succès, sous le rapport pédagogique, hygiénique, médicale, et militaire, le gouvernement de ce pays l'ayant introduite dans tous les colléges et dans tous les écoles publiques.

Frappé de ces avantages, l'ancien Ministre de l'instruction publique, M. de Salvandy, s'était adressé au gouvernement Suèdois pour avoir des renseignements sur l'éducation physique dans ce pays, et sur l'organisation de l'Institut Central de la Gymnastique rationelle de Ling. En même temps le gouvernement Prussien, juste appréciateur de toutes les innovations qui peuvent favoriser l'instruction publique, vient d'établir un institut à Berlin d'après cette methode. Arrivé en France pour faire connaître le système de Ling, lequel seul renferme les véritables *principes* d'une gymnastique rationelle, basée sur les lois physiologiques du corps humain, je viens de publier un aperçu sur la gymnastique suèdoise, que j'ai l'honneur de soumettre à votre appréciation éclairée, en signalant plus spécialement le chapitre rélatif à l'éducation physique. (Page 109—143.)

La gymnastique, qu'on a mise jusqu'ici en pratique, n'ayant pas tenu compte des lois qui président au devéloppement harmonieux de nos organes, a perdu tout préstige aux yeux des hommes consciencieux et éclairés. En effet, même sous le point de vue exclusivement pratique et militaire, elle est impuissante pour former une génération plus robuste et plus capable pour suppléer à la défense de la patrie, laquelle sera désormais la tâche de tout citoyen.

Si vous Monsieur le Ministre vouliez bien prendre en considération cette question d'une si haute importance, surtout dans les circonstances actuelles, peut être vous jugeriez convenable de nommer une commission, composée de médecins, d'instituteurs et de militaires pour examiner le système de Ling sur l'éducation

physique nationelle. Quant à moi, je m'empresserai de me mettre à la disposition de cette commission, afin de mettre au grand jour les avantages immenses d'une gymnastique vraiment rationelle.

En attendant votre décision aussitôt que les circonstances le permettent, j'ai l'honneur d'être, etc.

Paris, rue du 29 Juillet, 11.
12 Mars, 1848.

(C.)

À Monsieur le Ministre de la Guèrre.

Monsieur le Ministre,

On est convenu generalement aujourd'hui de regarder la gymnastique et l'éscrime comme un des moyens les plus efficaces pour donner au Soldat cette energie, sans laquelle il n'est qu'une machine, et cette force physique, qui en réagissant sur son moral, fait de lui un défenseur de la patrie à la fois digne et capable. Aussi dans toutes les armées Européens on a *essayé* de faire de la gymnastique une des branches de l'instruction militaire et presque partout on y a joint l'éscrime à la baïonnette.

Mais si jusqu'ici les résultats n'ont pas toujours répondu aux éspérances qu'on avait conçues, il faut l'attribuer principalement à ce que les differentes systèmes mises en pratique ne reposaient pas sur des bases larges et rationelles.

La gymnastique, au lieu d'avoir pour but principale de développer d'une manière harmonieuse toutes les parties du corps humain, s'est jusqu'ici bornée à développer les organes locomoteurs en négligeant certaines séries de mouvements qui, réagissant sur les organes internes, contribuent de cette manière plus puissamment à établir et à conserver l'état hygiénique du soldat, en le rendant en même temps plus apte à toutes sortes d'efforts.

Bien que par les moyens ordinaires, on pourrait presque dire routiniers, on soit parvenu à quelques résultats pratiques, il faut pourtant convenir que le but principal ést loin d'avoir été atteint. Ce n'est pas ici le lieu d'apprécier tous les avantages d'une méthode rationelle, fondée sur l'anatomie et le mécanisme du corps humain conformément aux récherches des physiologistes modernes. Il me

suffira donc de dire qu'en Suède, l'application d'une telle méthode a été couronnée des résultats très heureux, dès son introduction dans l'armée en 1830. On a observé *son influence sur la tenue, sur l'activité, sur l'amour de l'ordre et de la discipline du soldat,* ainsi qu'on a été a même *d'abréger le temps nécessaire à l'instruction du soldat depuis l'application de cette méthode, sans parler de la diminution notable des cas de maladies dans les régiments ou elle est journellement pratiquée.*

Frappé de tous ces avantages, le gouvernement Prussien, juste appréciateur de toutes les innovations qui peuvent favoriser l'instruction de l'armée, réjettant le précedant enseignement de la gymnastique moins simple, vient dans ces derniers temps de suivre l'exemple donnée par la Suède. Deux officiers furent envoyés en 1845 à l'institut central et royal de gymnastique à Stockholm, chargés d'étudier la gymnastique Suèdoise dans tout ce qui regard l'instruction militaire. Par suite des rapports qu'ils ont fait, un institut semblable vient d'être fondé à Berlin, sur les mêmes bases que celui de Stockholm, pour introduire ces améliorations dans l'armée Prussienne.*

La méthode qui est en vigeur en Suède est due à Ling, qui l'a crée au commencement de ce siècle. Elle consiste dans un système raisonné et anatomique de mouvements, destinés au développement harmonieux de toutes les parties du corps humain. Dans son application à l'armée l'inventeur n'a adopté que des mouvements dont les rhythmes, les formes et les caractères sont en rapport intime avec les évolutions que l'éxercise et les manœuvres exigent du soldat. Ces mouvements sont d'ailleurs d'autant plus avantageux à l'instruction militaire qu'au commencement ils n'éxigent aucun appareil, qu'ils sont d'une éxecution extremement facile, et qu'un nombre considérable d'hommes peuvent les exécuter simultanément.

Quant à l'éscrime à la baïonnette c'est reconnue que les méthodes mises en pratique, soit en Allemagne, soit en France, n'ont pas été analysées avec assez de rigueur: on parait avoir oublié que cette arme adaptée au fusil, éxige d'autres mouvements; qu'on doit s'appuyer sur d'autres lois que celles des armes blanches plus légères; et que le soldat, sur le champs de bataille, épuisé des

* See note, p. 243, on the official report by Coll. Borbstœdt.

fatigues et lourdement équipé, ne peut se mouvoir avec la même facilité que dans une salle d'armes. Ces défauts n'ont pas manqué de réagir sur l'enseignement du maniement de cette arme, qui en général dans nos armées n'occupe pas encore dans l'enseignement du soldat la place que son importance semble réclamer. Le système de Ling par rapport à la baïonnette, originel dans tous ses développements, est facil a saisir, à cause de la simplicité de l'idée première : *l'accord entre les deux centres de gravité de l'arme et du corps.*

Arrivé à Paris pour répandre en France les principes de Ling sur la gymnastique, dont j'ai publié un resumé dans le courant de l'année passé, et que j'ai l'honneur de soumettre à l'appréciation de votre Excellence, en lui signalant le chapitre rélatif á l'éducation physique (page 109—141), je prends la liberté de m'adresser à votre Excellence pour vous prier de vouloir bien m'accorder l'autorisation de faire une éssai d'application de cette nouvelle méthode de la gymnastique et de l'éscrime dans un des regiments stationés à Paris.

(D.)

Monsieur le Président de la République,

Le ministre de l'instruction publique ayant nommé une commission d'enquête sur la durée du travail dans les lycées et autres établissements d'instructions publiques, je me permets d'adresser à vous un aperçu sur l'éducation physique d'après Ling, introduite depuis plus de 30 ans dans toutes les ecoles et colléges en Suède. Il me semble que les questions que vous avez à traiter sont en rapport intime avec un réglement plus rationel de l'éducation physique. Or l'introduction d'un système basé sur les lois physiologiques du corps humain pourrait seule rémédier aux nombreux inconvénients qui résultent de l'organisation actuelle des écoles publiques.

Le système de Ling, basé sur l'unité du corps humain et sur l'action physiologique des mouvements comme moyen pour développer et *régénérer* notre organisme, tend non seulement à établir une harmonie complête entre les differentes forces et facultés de l'homme, mais il a en même temps un but plus général, c'est à dire de former de tous, les défenseurs de la patrie à la fois robustes et

habiles dans le maniement des armes. C'est pourquoi Ling admet l'éscrime de la baïonette, de l'épée, des évolutions militaires, etc., déjà dans des écoles, lorsque les exercises gymnastiques ont développé l'harmonie et l'équilibre en général dans les forces physiques.

Jusqu'à Ling la gymnastique, ne consistant que dans un empirisme vague, qui souvent même admettait des exercises en contradiction avec les lois de notre organisme, n'a été que tolérée comme un élément de l'éducation physique. Mais pour qu'elle puisse désormais devenir vraiment utile et opérer sa grande mission, la regénération de la race humaine, il faut non seulement qu'on la lie intimement à l'éducation intellectuelle et morale, *mais encore qu'on examine rigoureusement l'action physiologique de ses moyens.*

Ces quéstions une fois posées, il serait indispensable de fonder un établissement nouvel pour former des maîtres intelligents et versés dans l'anatomie et la physiologie aussi que dans la théorie et pratique de la Gymnastique pédagogique et militaire. Ce n'est que de cette manière qu'on pourrait détruire à jamais l'exploitation honteuse de la gymnastique des saltimbanques et des faiseurs des tours de forces, etc., en mettant cette branche si importante de l'éducation sous la sauve-garde de la science.

En cas que la commission jugerait convenable de prendre en considération cette question, d'une si haute portée pour les générations naissantes et pour laquelle je m'étais déjà adressé à MM. de Salvandy et Carnot et au ministre de la guèrre pour demander une commission d'énquête, je vous prie M. le Président de vouloir bien me prêter votre concours puissant et éclairé, afin que la France puisse aussi tirer partie de cette nouvelle science de l'éducation déjà connue et pratiquée en Prusse, en Russie, en Saxe, en Norvège, etc.

(E.)

My Lord,

Several private enquiries having lately been addressed to me by officers of the British Army upon the aim, character, and development of the system of Gymnastics and bayonet-fencing, on which the military training in Sweden is founded, it becomes to me

alike a pleasure and duty to offer my aid and service in case your Lordship should, at the present moment, deem this subject worthy of a more special examination. The object of my coming to England, and of my remaining here, is to introduce into the therapeutical practice of these kingdoms the Swedish Medical Gymnastics, and also to make known those branches of the system which belong to educational as well as military training.

As an important means of facilitating the training upon which a practical and efficient soldiership depends, Gymnastics have, already for some time, been introduced into all European Armies, and have considerably contributed to form the recruit into a smart, active, as well as powerful and healthy member of the army. It is not my intention on the present occasion to offer any remarks on the Gymnastics now employed in the British Army; nor to enlarge upon the direct advantages consequent upon the introduction of a method essentially founded on the harmonious development of all the several parts of the human body, by means of movements anatomically determined and employed on physiological principles. The system I advocate, invented by my celebrated countryman and master, Ling, not only offers all the advantages of a thorough anatomical analysis of the movements of the human body in their hygienic and educational mode of action, but proves also that on these principles we arrive at the surest and shortest way to the fullest development of health, bodily power, velocity of motion, and tenacity of effort.

Wherever the Swedish Gymnastics have been thoroughly examined and put to the test, they have proved superior to previously adopted methods; and in consequence of such a trial, schools have been established and adapted for the instruction of teachers, not only in Sweden and Norway, but also in Russia and Prussia; in the armies of which countries the system has been already for some considerable time introduced and practised.

Having been a teacher at the Central Gymnastic Institution of Stockholm for above twenty years, and during that time having for more than twelve years been particularly engaged in the introduction of Gymnastics and Bayonet-fencing in the Swedish Army, I am able to give full and satisfactory illustrations of the Swedish

method; and in case your Lordship should deem the subject worthy of your attention, and the present moment fit for an experiment, I am willing to instruct a class of recruits at any of the barracks of the Metropolis, provided a committee be appointed to report on the merits of the system.

As everything which promises to facilitate and shorten the drill and training of the recruit, in order to form him into a self-reliant soldier, who knows the resources of his own body and of his weapons, must be a question of great moment during a time of war, I trust your Lordship will give my proposition a due consideration.

I have the honour to be, etc.

To the Rt. Hon. Lord Panmure,
Her Majesty's Secretary of State for
the War Department, etc.
London, 1854.